

END 2015
***International Conference on
Education and New Developments***
27-29 June ♦ Porto, Portugal

Proceedings

Edited by
Mafalda Carmo



END 2015

International Conference on Education and New Developments

27-29 June ♦ Porto, Portugal

Proceedings

Edited by
Mafalda Carmo



Edited by:
Mafalda Carmo,
World Institute for Advanced Research and Science (WIARS), Portugal

Published in Lisbon, Portugal, by W.I.A.R.S.
www.wiars.org

Copyright © 2015 World Institute for Advanced Research and Science

All rights are reserved. Permission is granted for personal and educational use only.

Commercial copying, hiring and lending is prohibited. The whole or part of this publication material cannot be reproduced, reprinted, translated, stored or transmitted, in any form or means, without the written permission of the publisher. The publisher and authors have taken care that the information and recommendations contained herein are accurate and compatible with the generally accepted standards at the time of publication.

The individual essays remain the intellectual properties of the contributors.

ISBN: 978-989-99389-2-2

BRIEF CONTENTS

Foreword	v
Organizing and Scientific Committee	vii
Keynote Lecture	xi
Media Partners	xii
Index of Contents	xiii
Author Index	

FOREWORD

Dear Colleagues,

We are delighted to welcome you to the International Conference on Education and New Developments 2015 - END 2015, taking place in Porto, Portugal, from 27 to 29 of June.

Education, in our contemporary world, is a right since we are born. Every experience has a formative effect on the constitution of the human being, in the way one thinks, feels and acts. One of the most important contributions resides in what and how we learn through the improvement of educational processes, both in formal and informal settings. Our International Conference seeks to provide some answers and explore the processes, actions, challenges and outcomes of learning, teaching and human development. Our goal is to offer a worldwide connection between teachers, students, researchers and lecturers, from a wide range of academic fields, interested in exploring and giving their contribution in educational issues. We take pride in having been able to connect and bring together academics, scholars, practitioners and others interested in a field that is fertile in new perspectives, ideas and knowledge. We counted on an extensive variety of contributors and presenters, which can supplement our view of the human essence and behavior, showing the impact of their different personal, academic and cultural experiences. This is, certainly, one of the reasons we have many nationalities and cultures represented, inspiring multi-disciplinary collaborative links, fomenting intellectual encounter and development.

END 2015 received 528 submissions, from 63 different countries, reviewed by a double-blind process. Submissions were prepared to take form as Oral Presentations, Posters, Virtual Presentations and Workshops. It was accepted for presentation in the conference, 176 submissions (33% acceptance rate). The conference also includes a keynote presentation from an internationally distinguished researcher, Professor Dr. Martin Braund, Adjunct Professor at Cape Peninsula University of Technology in Cape Town, South Africa and Honorary Fellow in the Department of Education at the University of York, UK, to whom we express our most gratitude.

This volume is composed by the proceedings of the International Conference on Education and New Developments (END 2015), organized by the World Institute for Advanced Research and Science (W.I.A.R.S.) and had the help of our respected media partners that we reference in the dedicated page. This conference addressed different categories inside the Education area and papers are expected to fit broadly into one of the named themes and sub-themes. To develop the conference program we have chosen four main broad-ranging categories, which also cover different interest areas:

- In **TEACHERS AND STUDENTS**: Teachers and Staff training and education; Educational quality and standards; *Curriculum* and Pedagogy; Vocational education and Counseling; Ubiquitous and lifelong learning; Training programs and professional guidance; Teaching and learning relationship; Student affairs (learning, experiences and diversity); Extra-curricular activities; Assessment and measurements in Education.
- In **PROJECTS AND TRENDS**: Pedagogic innovations; Challenges and transformations in Education; Technology in teaching and learning; Distance Education and eLearning; Global and sustainable developments for Education; New learning and teaching models; Multicultural and (inter)cultural communications; Inclusive and Special Education; Rural and indigenous Education; Educational projects.

- In **TEACHING AND LEARNING**: Educational foundations; Research and development methodologies; Early childhood and Primary Education; Secondary Education; Higher Education; Science and technology Education; Literacy, languages and Linguistics (TESL/TEFL); Health Education; Religious Education; Sports Education.
- In **ORGANIZATIONAL ISSUES**: Educational policy and leadership; Human Resources development; Educational environment; Business, Administration, and Management in Education; Economics in Education; Institutional accreditations and rankings; International Education and Exchange programs; Equity, social justice and social change; Ethics and values; Organizational learning and change.

The proceedings contain the results of the research and developments conducted by authors who focused on what they are passionate about: to promote growth in research methods intimately related to teaching, learning and applications in Education nowadays. It includes an extensive variety of contributors and presenters, who will extend our view in exploring and giving their contribution in educational issues, by sharing with us their different personal, academic and cultural experiences.

Authors will be invited for inclusion of their extended works for inScience Press book *“Education Applications & Developments II”*.

We would like to express thanks to all the authors and participants, the members of the academic scientific committee, our media partners and, of course, to our organizing and administration team for making and putting this conference together.

Hoping to continue the collaboration in the future,

Respectfully,

Mafalda Carmo
World Institute for Advanced Research and Science (WIARS), Portugal
Conference and Program Chair

ORGANIZING AND SCIENTIFIC COMMITTEE

Organizer

World Institute for Advanced Research and Science (WIARS)
www.wiars.org

Conference and Program Chair

Mafalda Carmo
World Institute for Advanced Research and Science (WIARS), Portugal

International Scientific Committee

Aaron Doering • University of Minnesota,
USA

Abdurrahman Guelbeyaz • Osaka University,
Japan

Adrian Rosan • Babes-Bolyai University,
Romania

Agne Juskeviciene • Lithuanian University of
Educational Sciences, Lithuania

Ali Baykal • Bahcesehir University, Turkey

Ali Yildirim • Middle East Technical
University, Turkey

Allan Luke • Queensland University of
Technology, Australia, and University of
Calgary, Canada

Ana Maria Moraes Fontes • Universidade
Federal de Juiz de Fora, Brazil

Anca Draghici • Politehnica University
Timisoara, Romania

Angela Carrancho da Silva • UERJ / Fundação
Cesgranrio / Fundação Cecierj, Brazil

Annalene Van Staden • University of the Free
State, South Africa

Antonia Darder • Loyola Marymount
University, USA

Ayhan Ural • Gazi University, Turkey

Bernard Mulo Farenkia • Cape Breton
University, Canada

Beyza Nur Yilmaz • Ozyegin University,
Turkey

Brigita Janiunaite • Kaunas University of
Technology, Lithuania

Cagla Atmaca • Gazi University, Turkey

Carolina Bodea Hategan • Babes-Bolyai
University, Romania

Cezar Scarlat • University “Politehnica” of
Bucharest, Romania

Charalampos Karagiannidis • University of
Thessaly, Greece

Charles Elkabas • University of Toronto,
Canada

Christian Kahl • Taylor’s University, Malaysia

Christian M. Stracke • University of
Duisburg-Essen, Germany

Christine Besnard • Glendon College, York
University, Canada

Christopher Fowler • University of Essex, UK

Clara Barroso • University of La Laguna,
Spain

Colin T. Schmidt • Ensam - ParisTech &
Lemans University, France

Cristiano Luchetti • American University of
Sharjah, UAE

Cynthia Northington • William Paterson
University, USA

Daniela Pasnicu • Spiru Haret University,
Romania

Dario Ianes • Free University of Bozen, Italy

David Aparisi • University of Alicante, Spain

Dee O'Connor • The University of Notre Dame, Australia

Dennis Beach • University of Gothenburg, Sweden

Diana Dikke • IMC information multimedia communication AG, Germany

Diane Boothe • Boise State University, USA

Dominique Kern • University of Haute Alsace, France

Donata Puntil • King's College London, UK

Douglas Baleshta • Thompson Rivers University, Canada

Ecaterina Pacurar • Strasbourg University, France

Ellen Whitford • Armstrong State University, USA

Elsebeth Korsgaard Sorensen • Aalborg University, Denmark

Erik F. Överland • Free University of Berlin, Germany

Esi Marius Costel • Stefan Cel Mare University of Suceava, Romania

Evridiki Zachopoulou • Alexander Technological Educational Institute of Thessaloniki, Greece

Gabriel Dima • Innovate4Future, Center for Advances Educational Solutions and University Politehnica of Bucharest, Romania

Gina Chianese • Free University of Bozen, Italy

Grainne M. O'Donnell, University College Dublin, Ireland

Greg Misiaszek • Beijing Normal University, WCCES and UCLA, China / USA

Haim Shaked • Orot Israel Academic College & Jerusalem College, Israel

Hanna David • Tel Aviv University, Israel

Hans-Christian Schmitz • Institute für Deutsche Sprache, Germany

Harvey Oueijan • Notre Dame University, Lebanon

Helin Puksand • Tallinn University, Estonia

Ilijana Cutura • University of Kragujevac, Serbia

Ioana Velica • Babes-Bolyai University, Romania

Ioannis Agaliotis • University of Macedonia, Greece

Iryna Sekret • Zirve University, Turkey

Jana Kapounova • University of Ostrava, Czech Republic

Jana Mazancová • Czech University of Life Sciences Prague, Czech Republic

Janaina Cardoso • Rio de Janeiro State University, Brazil

Jeanne Schreurs • Hasselt University, Belgium

Joanna Paliszkiewicz • Warsaw University of Life Sciences, Poland

João Bottentuit Junior • Federal University of Maranhão, Brazil

Jose Augusto Oliveira Huguenin • Universidade Federal Fluminense, Brazil

José Luis Ortega-Martín • University of Granada, Spain

José Saturnino Martínez García • University of La Laguna, Spain

Josef Trna • Masaryk University, Czech Republic

Josep Sola Santesmases • Blanquerna – University Ramon Llull, Spain

Joy Kutaka-Kennedy • National University, USA

Juana Maria Sancho Gil • University of Barcelona, Spain

Judith Szerdahelyi • Western Kentucky University, USA

Julia Glidden • 21c Consultancy, UK

Kadi Lukanenok • Tallinn University, Estonia

Kamisah Osman • The National University of Malaysia, Malaysia

Karim Moustaghfir • Al Akhawayn University in Ifrane, Morocco

Katerina Kabassi • Technological Educational Institute of The Ionian Islands, Greece

Katerina Vlckova • Masaryk University, Czech Republic

Kiyoshi Nakabayashi • Chiba Institute of Technology, Japan

Konstantinos Kalemis • National University of Athens, Greece

Krista Loogma • Tallinn University, Estonia

Kyparisia Papanikolaou • School of Pedagogical and Technological Education, Greece

Kyria Finardi • Federal University of Espirito Santo, Brazil

Ladario da Silva • Universidade Federal Fluminense (UFF), Brazil

Laj Utreja • Director, Institute of Global Harmony, India

Laura Rio • University of Salerno, Italy

Laurent Moccozet • University of Geneva, Switzerland

Lee Dunn • University of Glasgow, UK

Lefkothea Kartasidou • University of Macedonia, Greece

Liliana Dozza • Free University of Bozen, Italy

Liliana Milevicich • Universidad Tecnologica Nacional, Argentina

Lizbeth Goodman • University College Dublin, Ireland

Loreta Chodzkiene • Lithuanian University of Educational Sciences, Lithuania

Lorna M. Dreyer • Stellenbosch University, South Africa

Luca Refrigeri • University of Molise, Italy

Lucía Casal de la Fuente • University of Santiago de Compostela, Spain

Luminita Cocarta • Al. I. Cuza University of Iasi, Romania

Maria Meletiou-Mavrotheris • European University Cyprus, Cyprus

Maria Moundridou • School of Pedagogical and Technological Education (ASPETE), Greece

Maria Schwarz-Woelzl • Zentrum fuer Soziale Innovation GmbH, Austria

Maria Carme Boqué Torremorell • Ramon Llull University, Spain

Maria Rosa Buxarrais • University of Barcelona, Spain

Marielle Patronis • Zayed University, UAE

Marta Cabral • Columbia University, USA

Mdutshekelwa Ndlovu • Stellenbosch University, South Africa

Megan Lawton • University of Wolverhampton, UK

Meral Aksu • Middle East Technical University, Turkey

Metaxia Pavlakou • Oxford Brookes University, UK

Michael Reiner • IMC University of Applied Sciences Krems, Austria

Michal Pietrzak • Warsaw University of Life Sciences, Poland

Milan Kubiato • Masaryk University, Czech Republic

Mingming Zhou • University of Macau, China

Miroslava Cernochova • Charles University in Prague, Czech Republic

Nadir Kolachi • Skyline University, University City of Sharjah, UAE

Naseer Ahmed • Al Ghurair University, UAE

Nikolaos Marianos • Agro-Know Technologies / University of The Aegean, Greece

Nobuko Fujita • University of Windsor,
Canada

Odetta Gabaudan • Dublin Institute of
Technology, Ireland

Olivier Marty • CNAM, France

Özgün Kusaner • Dokuz Eylul University,
Turkey

Pamela Deponio • Private Practice, UK

Paola Damiani • University of Turin, Italy

Pascal Marquet • University of Strasbourg,
France

Patricia Obando-Solano • Michigan State
University, USA

Patricia E. Reynolds • University of Mary
Washington, USA

Peter Jarvis • University of Surrey, UK

Petros Kefalas • University of Sheffield
International Faculty, Greece

Pythagoras Karampiperis • National Centre
for Scientific Research “Demokritos”, Greece

Rasa Nedzinskaite • Lithuanian University of
Educational Sciences, Lithuania

Rashid Jayousi • Al-Quds University, Palestine

Rawad Chaker • University of Cergy-Pontoise,
France

Razvan-Lucian Andronic • Spiru Haret
University, Romania

Rhona Sharpe • Oxford Brookes University,
UK

Roberta Gentry • University of Mary
Washington, USA

Roger Nkambou • University of Quebec at
Montreal, Canada

Romano Martini • Niccolò Cusano University,
Italy

Sean Doyle • Institute of Education, University
of London, UK

Selma Garrido Pimenta • Universidade de São
Paulo, Brazil

Seth Agbo • Lakehead University, Canada

Seweryn Spalek • Silesian University of
Technology, Poland

Shakila Singh • University of Kwazulu Natal,
South Africa

Sheryl Williams • Loughborough University,
UK

Silvia Pokrivcakova • Constantine The
Philosopher University, Slovakia

Simon Richir • Arts et Metiers Paristech
(ENSAM), France

Stephen Hughes • University of Granada, Spain

Steven Malliet • University of Antwerp,
Belgium

Surendra Pathak • Iase Deemed University,
India

Suzani Cassiani • Universidade Federal de
Santa Catarina, Brazil

Theodoropoulou K. Eleni • University of
Aegean, Greece

Tintswalo Manyike • University of South
Africa, South Africa

Tony Toole • University of Wales, Trinity Saint
David, UK

Ulas Basar Gezgin • British University
Vietnam & Staffordshire University, UK

Valeria Oliveira de Vasconcelos • Unisal –
Centro Universitário Salesiano de São Paulo,
Brazil

Vasile Chis • Babes-Bolyai University,
Romania

Vassilis Argyropoulos • University of
Thessaly, Greece

Verica Babic • University of Kragujevac,
Serbia

Veronica Violant Holz • University of
Barcelona, Spain

KEYNOTE LECTURE

“A NEW STEAM AGE: TOWARDS ONE CULTURE FOR LEARNING”

Professor Dr. Martin Braund

*Adjunct Professor at Cape Peninsula University of Technology in Cape Town (South Africa) and
Honorary Fellow in the Department of Education at the University of York (United Kingdom)*

Abstract

In many cultures learning has been organised around subject disciplines broadly conceived as the Arts, Humanities and Sciences. Subject disciplines of the curriculum have evolved structures and characteristics creating boundaries between them that are counter to the experiences of many adolescents, who rarely meet such borders in their daily lives. Disciplinary borders favour a utilitarian view of knowledge and creativity, often under-valuing some disciplines, including the creative and performing arts, not directly associated with primary means of economic production. The borders between self-reinforcing disciplinary structures result in inadequate attention paid to the potential of working across, between and beyond disciplines. In this keynote I examine how this schism between the ‘Arts’ and ‘Sciences’ has come about and the potential harm it continues to do. An example from the history of science, the case of Darwin’s changing relationship with the two cultures, is used to promote the benefits of more creative approaches to teaching science in a new project, ‘Darwin Inspired Learning’. The benefits to learning science using one of the Arts, drama, are shown. The argument is made for ‘**STEAM**’, showing how education in the 21st Century is moving away from a restricted notion of STEM (Science, Technology, Engineering and Mathematics) to one that encompasses the Arts (Science, Technology, Engineering, **ARTS** and Mathematics). **STEAM** promotes economic development, encouraging people to work creatively to generate and communicate ground breaking new ideas.

Brief Biography

Martin Braund is Adjunct Professor at Cape Peninsula University of Technology in Cape Town, South Africa and Honorary Fellow in the Department of Education at the University of York.

After graduating in Zoology and Geology from Exeter University he taught science in secondary schools in Cardiff, York and Boroughbridge for 18 years. In 1989-1991 he completed a Masters in Science Education while working as a Research Fellow for the Assessment of Performance Unit in Science at the University of Leeds. He holds a PhD from the University of York focused on research in transition from primary to secondary school.

Much of his work is connected with innovative approaches to teaching science and biology. His wife is an actress and he has a great interest in the history and philosophy of the theatre. Martin has published over seventy journal articles and his books and chapters in books are internationally known in the fields of transition, informal learning outside the classroom (with Michael Reiss), argumentation, teacher education and drama in science. His most recent book, *Performing Science* (Bloomsbury, 2012), was shortlisted for education resource of the year.

Martin is a member of several international research organisations and editorial boards of leading journals and is editor of *Science Teacher Education*. He has worked as consultant, adviser and keynote speaker in over 20 countries of Europe, Australasia and Africa.

SPONSORS

Sponsor:



<http://www.wiars.org>

Media Partners:



<http://knowdoservelearn.org>



<http://www.globaleducationmagazine.com>

INDEX OF CONTENTS

ORAL PRESENTATIONS

Teachers and Students

An Effort to Make American Classrooms Culturally Responsive <i>Krystyna Nowak-Fabrykowski</i>	3
Improving Student Engagement and Professional Competency by Using Simulations in Law School Courses <i>Todd Brower</i>	8
Problem Solving as Program Code Description <i>Edward Brown</i>	13
EU Founded Teacher Education Improvements in Hungary <i>Krisztián Pálvölgyi, Horváth H. Attila, Éva Bodnár and Judit Sass</i>	18
Effects of Real-Word Versus Pseudo-Word Phonics Instruction on the Reading and Spelling Achievement in First Graders <i>Jihan H. Khalifeh Mohamad and Ahmad Oweini</i>	23
Language Maintenance and Students' Identities in English Minority Language Schools in Québec <i>Diane Gerin-Lajoie, Max Antony-Newman and Pierre-Olivier Bonin</i>	27
The Development of the Personal and Professional Values Framework as an Aid to Ethical Decision-Making <i>Hua Hui Tseng</i>	32
Social Network Addiction <i>Júlia Hong Ventayol Alsina</i>	37
Enhancing Active Learning in the Modern Biology Classroom <i>George M. Malacinski</i>	41
Knowledge and Result <i>Eszter Gombos and Maria Csernoch</i>	44
Enabling and Disabling Environment Influencing Learners' Learning Experiences <i>Soane Joyce Mohapi</i>	49
The Sociopolitical Context of Language Reform in Higher Education in Post-Soviet Kazakhstan <i>Seth Agbo and Natalya Pak</i>	53
Thinking About Education <i>Patricio Alberto Cullen and Liliana Mabel Marinelli</i>	54
Construction of Rubrics for the Evaluation of Technology Courses in Colombia <i>Luis Fernando Vargas Neira, Fredy Andrés Olarte Dussan and Jhon Jairo Ramírez</i>	57
Performance Calibration Through Partly Peer Assessment <i>Yonghuai Liu, Honghai Liu, Yitian Zhao and Ran Song</i>	62

Gender Differences in the Implementation of School-Based Assessment in a Malaysian State	67
<i>Arsaythamby Veloo, Ruzlan Md-Ali and Hariharan N. Krishnasamy</i>	
Advanced Computer Technology for Assessment and Measurements the Level of Knowledge of the University Students	72
<i>Gennadiy Burlak and Jose Alberto Hernandez Aguilar</i>	
Does Contact Really Matter? Exploring the Effects of Contact on Prejudices and Professional Representations	77
<i>Mariane Gazaille, Karine Gauthier, Louis Gosselin and Jean-Nil Boucher</i>	
Deconstruction, Co-Construction and Reconstruction: Creating an Integrated Teacher Education Program	82
<i>Angela Ward</i>	
Process of Continued Education in the Program School Managers of Public Basic Education	83
<i>Rita Márcia Andrade Vaz de Mello , Leililene Antunes Soares, José Márcio Silva Barbosa and Maria das Graças Soares Floresta</i>	
"Fatherhood in the Classroom": When Life as a Father Meets the Teaching Profession	87
<i>Ina Ben-Uri</i>	
Teaching for Employability: Key Concepts and Best Practice Principles	91
<i>Henri Jacobs</i>	
Teaching Scientific Research and Pratical Application of the Concept of Charge Distribution to Students	96
<i>Andrey Lider and Vitaly Larionov</i>	
Teaching Adult Learners: a Piece of Cake?	101
<i>Jane Iloanya</i>	
An Alternative Model to Professional Development in Multilingual EFL Classrooms: Cooperative Management & Residual Practice	106
<i>Sibel Kaymakamoğlu and Çağda Kivanç Çağanağa</i>	
Preparing Voice Professionals at Faculties of Education Using Applied Methods and Technology	111
<i>Lucie Šebková and Kateřina Vitásková</i>	
IBSE Profiles-Modules in Science Teacher Education	116
<i>Josef Trna and Eva Trnova</i>	
EDUCOLAND as an Example of Linking Educational Theory and Practice	121
<i>Eva Trnova, Josef Trna and Jan Krejci</i>	
 <u>Projects and Trends</u>	
Understanding Teacher Educators' Pedagogical and Technological Cultural Habitus (Patch) in the Maldives	126
<i>Aminath Shafiya Adam</i>	
How Blackboard e-Learning Tool Affects Intermediate Chinese Speaking and Listening Course	131
<i>Tungyue Hon</i>	

Teaching and Learning in Technology Rich Schools: Traditional Practices in New Outfit <i>Catarina Player-Koro and Dennis Beach</i>	136
Significant Learning in Virtual Learning Environments <i>Richard Gagnon</i>	141
Project of Flipped Classroom's Incorporation: an Experience Between Primary Schools and University <i>Jordi Simon Llovet, Elena Sofia Ojando Pons, Loles Gonzalez Garcia, Miquel Àngel Prats Fernandez, Xavier Àvila Morera and Antoni Miralpeix Bosch</i>	146
Development and Innovation of Free Online Education System, "JMOOC" in Japan <i>Kaori Ishibashi, Suguru Yanata and Takao Nomakuchi</i>	151
Constructing Knowledge with New Information and Communication Technologies <i>Marcelo Mendonça Teixeira, Walter Felipe dos Santos, Hugo V. L. Souza, Fábio Lopes Bione, Josival dos Santos Silva, Hugo Pazolline B. dos Santos, Demétrio A. de Santana, Gilberto Cysneiros, Ivonaldo Torres, José Eduardo de Lima Cruz and Joel A. de Lima Júnior</i>	155
The Teacher as a Mediator of Interactions In Virtual Learning Environment: Focus on Discussion Forums <i>Ana Paula de Araujo Cunha and Beatriz Meggiato Oreques de Araujo</i>	160
The Diffusion of Social Networking Site in Students' Learning Experience as a Novel Pedagogic Tool <i>Su Iong Kio</i>	165
Development and Evaluation of an Innovative Arduino-Based Datalogging System for Enhancing Field-Based Learning <i>Yau Yuen Yeung, Frank C.C. Cheang and Lincoln Fok</i>	170
Dialogic Reading and Book Clubs. Theoretical Framework <i>Carmen Álvarez-Álvarez</i>	175
The Creada, a New Pedagogical Center for Adults Informal Education <i>Maria Luisa De Natale and Cristiana Simonetti</i>	179
Adolescents' Health Literacy as a Buffer in a Crises Context of a Legionella Outbreak in Portugal (Cradlisa Project HLS-EU-PT) <i>Luís Saboga-Nunes, Gabriela Cavalheiro, Sandrina Correia, Anabela Santos, Paulo Pinheiro, Ullrich Bauer and Orkan Okan</i>	184
Using Intensive Games Development Projects to Teach Entrepreneurial Skills to Third Level Students <i>Derek O'Reilly, Fernando Almeida, Krzysztof Podlaski, Hiram Bollaert, Piotr Milczarski, Shane Dowdall, Artur Hłobaż and Justino Lourenço</i>	189
Teaching in Values in Higher Education: Innovation by Online Dialogue Between Students from Different Universities <i>Elena Briones, Raquel Palomera and Alicia Gómez-Linares</i>	194
Problem-Based Learning in Science, Technology, Engineering and Mathematics (STEM) for 21st Century Global Learners <i>Diane Boothe and Melissa Caspary</i>	199
Early School Leaving – Contributions from Portugal <i>Anabela Mesquita, Diana Vieira and Paulino Silva</i>	204

Auditory Access and Distinction of Visual Document Elements by Blind and Sighted Students	209
<i>Vassilios Argyropoulos, Georgios Sideridis, Aineias Martos, Magda Nikolaraizi and Eleni Katsiafourou</i>	
Haptic Recognition of Two-Dimensional Tactile Patterns of Basic Geometric Shapes by Individuals with Visual Impairments	214
<i>Vassilios Argyropoulos, Maria Papazafiri, Sofia-Marina Koutsogiorgou and Magda Nikolaraizi</i>	
Speech and Language Software in the Intervention of Autism Spectrum Disorder Related Oral Motor Abilities	219
<i>Kateřina Vitásková and Alena Říhová</i>	
Does Primary School Teachers' Age Impact on e-Learning?	224
<i>Lung-Hsing Kuo and Hung-Jen Yang</i>	
Assessing Online Learner Interaction: a Distributed Learning Environment Model	229
<i>William L. Havice and Pamela A. Havice</i>	
Towards Improved Learning Quality by Remotely Operable Laboratories	234
<i>Ulrich Borgolte, Michael Gerke, Ivan Masár and Pavol Bahník</i>	
Pedagogical Mediation Between Tutors and Students in the National Program School Managers	239
<i>Leililene Antunes Soares, Rita Márcia Andrade Vaz de Mello, José Márcio Silva Barbosa and Maria das Graças Soares Floresta</i>	
Online Education: Another Vision About Web Radio	243
<i>Marcelo Mendonça Teixeira, Marcelo Brito Carneiro Leão, Elilton Oliveira, Hugo V. L. Souza, Walter Felipe dos Santos, Ivonaldo Torres, Filipe Lima Gonçalves, Demétrio A. de Santana, Nivaldo Marques da Silva Júnior and Hugo Pazolline</i>	
Peacebuilding Anthropology as a New Course at the University in Central & Eastern Europe	248
<i>Katarína Slobodová Nováková</i>	
Towards Integrative Approaches Through Multilingual Activities: Teachers, Pupils and Families Experiencing a Collaborative Project	251
<i>Sheila Padiglia and Francesco Arcidiacono</i>	
The Performative Intercultural Pedagogy – the Anarchic Arts of Learning and Teaching in/between Scholarized Worlds and Subjects	256
<i>Anja Maria MacKeldey</i>	
Providing Lecturers with Information about Eco-Friendly Transport via an Information Platform	261
<i>Lisa-Maria Putz and Alexandra Haller</i>	
The Use of e-Learning Technology for Community-Based Teaching in Medical Schools	266
<i>Carmen Patricia Obando and Geraud Plantegenest</i>	
Gamification for Energy Profile Modification	271
<i>Aphrodite Ktena, Enea Mele, Eugenia Tsalkitzi, Charalambos Elias and Christos Manasis</i>	
Inclusion in Practice in Cyprus: a Matter of Teachers' Beliefs	276
<i>Elena Anastasiou</i>	
Building Gamified Applications for Informal Education	281
<i>Aphrodite Ktena</i>	

Pathways to United Ukraine: Teacher Candidates Learn to Handle Intranational Conflict <i>Tetyana Koshmanova and Tetyana Ravchyna</i>	286
Learning the Ropes: a New Perspective on Children Crossing Cultures <i>Patricia E. Reynolds</i>	291
Combining Biotechnology and Molecular Gastronomy Projects to Promote Career Success and Creativity of Non-Science Majors <i>Paloma Valverde</i>	295
Transforming Primary Education and Pedagogy – the Case of School Gardens in Denmark <i>Pernille Malberg Dyg</i>	300
Time to Learn: Adapting Teaching Timetable for Learning Improvement <i>Mario Campanino, Maeca Garzia, Giuseppina Rita Mangione and Maria Chiara Pettenati</i>	305
From Embodied Simulation to Enactive Learning: Embodied Education Trough Art and Theatre <i>Nazario Zambaldi</i>	310
What is a Multisensory Tent? Developing a Multisensory Method and New Learning Environments <i>Sari Kivilehto, Anne Malin and Minttu Rätty</i>	315
Simulation as a Model of Political Participation Teaching <i>Kinga Anna Gajda and Aneta Pazik</i>	319
 <u>Teaching and Learning</u>	
Risk Management and the Identification of Nursing Students at Risk <i>Naomi Malouf and Rena Frohman</i>	324
Activating Lecture Within Higher Education – Today and Perspective <i>Mariana Sirotova</i>	329
The Art of Teaching in Teaching Art <i>So-Lan Wong</i>	334
A Case Study of Students’ Decision-Making About Postgraduate Education in China <i>Dan Liu</i>	335
Final Degree Works: a New Challenge for the Future Teachers of Infant and Primary Education. (Some Perspectives from Experimental Sciences) <i>Constancio Aguirre Pérez</i>	340
Educational Models of Compatibility: Secondary Education and High Level Sport <i>Josep Solà Santesmases</i>	345
A Comparison of the Effectiveness of the Capsular and Heuristic Models for Developing In-Service Teachers’ Pedagogical Content Knowledge for Nature of Science <i>Elaosi Vhurumuku</i>	348
A Case Study: Exploring Children’s Understanding of Death and their Attitude Towards Life With Picture Books <i>Ran Lee and Eunja Hyun</i>	353

Social Media as a Communication Tool with Families: a Kindergarten Case <i>Fusun Akdag and Tugba Ozdinc</i>	358
Teachers: the Keystone of Social and Emotional Learning Program Effectiveness <i>Raquel Palomera, Elena Briones and M^a Angeles Melero</i>	361
Educators' Perception on the Use of Folklore in Primary School <i>Pule Phindane</i>	365
How Strong and Weak do Preschool Teachers Consider Themselves in Interactions <i>Hana Navrátilová</i>	370
Artists, Curators and Museum Educators: Children as part of an Artmakers' Community <i>Marta Cabral</i>	375
Developing Digital Competence in Non-Traditional Programming Environments <i>Maria Csernoch and Piroska Biro</i>	380
An Investigation of Self-Regulated Strategy Development as a Framework to Enhance Student Writing in an Australian Mainstream Classroom <i>Robin Smith</i>	385
Self-Reflecting Log as a Method in Intervening Studies <i>André Rondestvedt</i>	386
Flipp Statistic Courses! <i>Andrea Breitenbach</i>	391
Interactive French Language Teaching through Films <i>Canan Aydinbek</i>	396
Using Corpora to Raise Hong Kong Students' Awareness of Appropriate Word Choice <i>Adrian Ting</i>	400
 <u>Organizational Issues</u>	
Conversion of a Web Application for Graduate School Administration into a Mobile Web App <i>David Edelman</i>	401
Creating Inclusive Workplaces for Persons With Disabilities as an Integral Element of Diversity Management <i>Marzena Wójcik-Augustyniak</i>	406
Linguistic and Cultural Capital at an American University in the United Arab Emirates: a Narrative Case Study <i>Zsuzsanna Mikecz Munday</i>	411
New Development and Innovation of Financial Education in Japan <i>Suguru Yanata, Kaori Ishibashi and Takao Nomakuchi</i>	416
Education and Transition to Work: Promoting Practical Intelligence <i>Giuditta Alessandrini</i>	421
A Comparative Look at Social Justice in South African Education and Norwegian Introduction Programme for Refugees <i>Anne Grethe Sønsthagen</i>	426

Educational Leadership in the Chinese Mainland: a Case Study of Two Secondary Schools in Beijing <i>Manhong Lai and Lijia Wang</i>	431
A Faith-Based Intervention to Improve Nutritional Habits Within African American and Hispanic Populations <i>Victor Romano, Karen L. Butler and Elliot Royal</i>	432
Making Use of the External Evaluation Report in School's Work Improvement <i>Joanna Kołodziejczyk</i>	436
The Pathways of Leadership's Indirect Influence on Students' Learning Processes <i>Jakub Kołodziejczyk</i>	440
The Passage from Teaching to Administration: Socialisation of Vice-Principals in Hong Kong <i>Paula Kwan</i>	444
Education by Principles: What Education? Which Principles? <i>Marcus Vinicius Santos Kucharski</i>	449
School Autonomy: 21st Century Developments <i>José da Costa, Paul Newton, Frank Peters and Lorne Parker</i>	454
Perceived Practices and Influence of Educational Leaders on Academic Success in K-12 Adult Schools <i>Gustavo Lara-González</i>	459

POSTERS

Teachers and Students

Immigrant Teachers: Professional Induction Challenges and Strategies <i>Claire Duchesne, Nathalie Gagnon and France Gravelle</i>	467
The Aesthetics of Everyday Life in Primary School and the Implications of Aesthetic Education <i>Ya-Ting Lee</i>	469
Cinema, Biology and Education in Secondary School: Construction of a Lifelong Learning <i>Marcia R. Pereira and Ana Beatriz F. Ribeiro</i>	472
Engineer-Teachers in the Changing Attraction of the Teaching Career <i>Anetta Bacsa-Bán</i>	475
Are Booksellers Encouraging the Cultural Extinction of Sciences? A Longitudinal Study Regarding the Overstayed Welcome of Pseudosciences in Bookshops of Quebec <i>Carole Sénéchal and Serge Larivée</i>	478
School Administrators. in Good or Bad Psychological Health? <i>Carole Sénéchal and Michel St-Germain</i>	479
21st Century Foreign Language Teaching: Mapping Teacher Educators' ICT Attitudes, Knowledge and Skills <i>Maurice Schols</i>	482

“Of Course, I Control it”: Comparative Study of Teachers’ Emotions in Upper Secondary Education (Secondary Grammar and Secondary Vocational Schools)	485
<i>Judit Sass, Éva Bodnár, Horváth H. Attila and Krisztián Pálvölgyi</i>	
Students, Parents and Teachers’ View on Extra-Curricular Educational Processes in School	488
<i>Joanna Kolodziejczyk</i>	
Using Computer Simulations to Prepare Future Teachers	491
<i>Roberta Gentry</i>	
Self-Efficacy, Interest, Goal Achievement: How to Use Motivation in Classroom?	494
<i>Julien Masson</i>	
 <u>Projects and Trends</u>	
Effectiveness of Early Intervention for Reading Development in Students with Reading Disabilities	497
<i>Renata Mousinho</i>	
Biology Inclusive Education in Secondary Education: Building an Education for All	500
<i>Sergio E. C. P. Silva, Simone J. R. Maciel and Marcia R. Pereira</i>	
Transport Simulation for Educational Purpose	503
<i>Alexandra Haller and Lisa-Maria Putz</i>	
The Family Influence on Reading Comprehension in Children with Dyslexia	506
<i>Nayana Pires da Silva Rodrigues, Raquel Rosa Mendonça and Renata Mousinho</i>	
The Effect of the Theme Centered Interaction on the Teachers’ and on the Students’ Work	509
<i>Rita Sápiné Bényei</i>	
Case Study of a Scholar With Dyslexia: the Role of Inclusive Education and RTI Program	510
<i>Maria Clara Holanda, Carolina Sathler and Renata Mousinho</i>	
Service Learning: a High Impact Practice with First Generation, Minority College Students	513
<i>Linda R. Guthrie and Pamela L. Knox</i>	
Fingerpaints and Masterpieces: Babies in the Art Museum	516
<i>Marta Cabral and Effie Phillips-Staley</i>	
Towards a Sustainable Future for Schools: Enough for All, Forever	519
<i>Rosemary Papa</i>	
The Use of Virtual Learning Environments at Feausp	521
<i>Andrea Consolino Ximenes</i>	
A Transition from the Beginner to the Mentor: a Contribution to Further Education of Preschool, Primary and Secondary School Teachers	524
<i>Adriana Wiegrová, Peter Gavora and Hana Navrátilová</i>	
The Positive Experience of Students in Larger Class Sizes and Innovative Technology Relating to that End	527
<i>Karen Fraser & Colette McCreesh</i>	

World-Wide Collaborative Network of Scholars: the Flagstaff Seminar Educational Leaders without Borders <i>Rosemary Papa</i>	528
Functions of Preschools as Perceived by Students of Pre-Primary University Education <i>Adriana Wiegerová and Peter Gavora</i>	530
The Virtual Learning Environment (Moodle): a Tool in the Process of the Teaching and the Learning <i>Marcia Helena Sauaia Guimarães Rostas</i>	533
Survey on Social Networks Use in the Teaching-Learning Process and its Correlation with Students Socioeconomic Status in Two Public Higher-Education Institutions in México <i>Pedro Moreno-Badajós, Antonio Ponce-Rojo and Jorge Hernandez Contreras</i>	536
Mobile Learning in Hong Kong Teacher Education: Students' Level of Readiness and Receptivity <i>Irene C.M. Lam, Chi HoYeung and Yau Yuen Yeung</i>	539

Teaching and Learning

Lifelong Learner Growth: in What Ways Does College Instruction Help and Hinder? <i>Katherine C. Chen, Roberta J. Herter and Jonathan D. Stolk</i>	542
Scientific Attitude and Motivation Toward Learning Science of 7th Grade Students <i>Hasan Ozyildirim, Husnuye Durmaz and Seckin Mutlu</i>	545
Utilization of Ad-Hoc Wireless Networks Models in Courses of Discrete Mathematics <i>Adriana Dapena, Maria José Souto-Salorio, Magda Dettlaff and Magdalena Lemańska</i>	548
Flipped Homework Solutions <i>Andrea Breitenbach</i>	551
Videos: Do they Distract or Inspire Learning? Application to Chemistry Lab of First University Year <i>Sara García-Salgado, M. Ángeles Quijano Nieto, Rosa Domínguez Gómez, M. Carmen Heredia Molinero and Rosario Torralba Marco</i>	552
The Electron Microscopy Technique as an Educational Resource to Explore the Conception of Science by the Students in Classes of Chemistry <i>Mayara de Carvalho Santos, Ladário da Silva and Alceu Júnior Paz da Silva</i>	555
Effects of Inquiry-Based Science Teaching on Students' Science Processes and Critical Thinking Skills and Achievements <i>Hüsnüye Durmaz and Özden Çolak</i>	558

Organizational Issues

The Content of Trust and the Function of Manager and Educational Leader in School Heads' Opinions <i>Jakub Kołodziejczyk</i>	561
Mobile Science: the Environmental Issues Study <i>Anelise Leal Vieira Cubas, Marina de Medeiros Machado, Ana Regina de Aguiar Dutra, Elisa Helena Siegel Moecke, Ivete Rossato and Rachel Faverzani Magnago</i>	564

Interpretation of University Quality in Perspective of TCM <i>Yanhua Wang</i>	567
A Study of Business Management Education by Simulation Using the Business Game <i>Takao Nomakuchi, Suguru Yanata and Kaori Ishibashi</i>	570
Have Pseudosciences Laid Anchor in Bookshops of Quebec? a Longitudinal Study <i>Serge Larivée, Carole Sénéchal and Dave Miranda</i>	573

VIRTUAL PRESENTATIONS

Teachers and Students

The Quality Chain in Education – a Grid Approach <i>Dimitrios A. Giannias and Eleni Sfakianaki</i>	579
--	------------

Projects and Trends

Four Legged Teachers. What About Animal as Teacher? <i>Alessia Gallo, Laura Rio and Filippo Gomez Paloma</i>	584
From Sport Education to Inclusive Teaching for the Identification of Sen <i>Laura Rio, Paola Damiani and Filippo Gomez Paloma</i>	589
Hybridizing L2 Learning: Insights from an Intact Class Experience <i>Nádia Silveira and Kyria Rebeca Finardi</i>	593
The Measurement Invariance of Job Diagnostic Survey (JDS) Across Three University Student Groups Title <i>Mónica Martínez-Gómez, Juan A. Marin-Garcia and Martha Giraldo O'Meara</i>	598
Web 2.0 Tools for the L2 Class <i>Karina Antonia Fadini and Kyria Rebeca Finardi</i>	603
Analyzing Moral Education in Schools in Germany <i>Birgitta Maria Kopp, Sandra Niedermeier and Heinz Mandl</i>	608
A Remotely Controlled Experiment to Determine the Earth'S Magnetic Field <i>Marco Aurélio Alvarenga Monteiro, Isabel Cristina de Castro Monteiro, Leonardo Mesquita, Galeno José de Sena and José Silvério Edmundo Germano</i>	611

Teaching and Learning

Teaching and Learning Natural Sciences with IBSE Methodology: a Study Outside Classroom <i>Ana Cristina Tavares, Ilídia Cabral and José Matias Alves</i>	616
--	------------

Organizational Issues

The Pattern of the Internal Governance of Private Universities in China <i>Xu Liu</i>	620
---	------------

WORKSHOP PRESENTATIONS

Teaching and Learning

Children at Risk for Mental Disorders and the Impact of Teachers on Child Mental Health Promotion <i>Paulo Pinheiro, Agar Almeida, Orkan Okan, Dirk Bruland, Anabela Pereira, Luis Saboga Nunes, Ester Lopes and Ullrich Bauer</i>	627
Process Drama in a Creative, Brain – Friendly Language Education <i>Alicja Gałazka</i>	630
Magic Science: Introducing Mystery to Learning Scientific Inquiry <i>Ran Peleg, Dvora Katchevich, Malka Yayon, Rachel Mamlok-Naaman, Johanna Dittmar, Peter McOwan, Peter Childs, Tony Sherborne, Julie Jordan, Marina Carpineti, Marco Giliberti, Cristina Olivotto and Ingo Eilks</i>	633

<u>AUTHOR INDEX</u>	637
----------------------------	------------

Oral Presentations



AN EFFORT TO MAKE AMERICAN CLASSROOMS CULTURALLY RESPONSIVE

Krystyna Nowak-Fabrykowski

*Department of Teacher Education and Professional Development
Central Michigan University (USA)*

Abstract

The situation for immigrant children is often difficult because, in the course of their lives in the United States, they encounter many different kinds of borders (Patel, 2013). One way to ameliorate their situation is to provide culturally responsive teaching. Twenty one early childhood teachers working in the Midwest in the United States took part in this research project, and two hundred eighty children. This project was based on action research addressed to answer two main questions: How culturally responsive is my classroom environment, my curriculum and my teaching strategies? and How can I improve my practice to make it more culturally responsive? The teachers assessed their classrooms using Kendal's (1983) checklist and initially came up with thirteen activities that could be implemented. The results of the assessment demonstrated that every classroom needed some modifications and implementation of new strategies, materials and projects. This paper discusses the detailed outcomes of their project.

Keywords: *culture, responsive teaching*

1. Introduction

Taking into consideration the fact that 13% of the US population consists of immigrants (Kao et al., 2013), it is necessary to keep the curriculum responsive to the social and cultural realities of young children (Bredecamp & Copple, 1997, p. 9). Teachers have an ethical responsibility to advocate for children and to provide safe, healthy, nurturing, and responsive settings. They must support children's development, respect their individual differences, help children learn to live and work cooperatively, and promote health, self-awareness, competences, self-worth, and resiliency (Baptiste and Reyes, 2008).

According to recent research findings, half of the students in the suburbs of the largest American metro areas are non-white as of 2011 (Orfield 2014). The United States has 41.3 million legal and illegal immigrants, the highest percentage in 93 years (Perez, 2014) and the predictions are that there will be 40% of language minority (LM) students in the U.S. by 2030 (Thomas & Collier 2002 quoted by Drake, 2014). The United States has 41.3 million legal and illegal immigrants, the highest percentage in 93 years (Perez, 2014).

2. Review of literature and conceptual framework

Banks' (2007) definition of multicultural education emphasis includes that all students, regardless of the groups to which they belong--such as those related to gender, ethnicity, race, culture, language, social class, religion, or exceptionality--should experience educational equity in the schools (p.25). To make this ideal possible the teachers should develop strategies and make curricular changes to help all children to reach their full potential.

The principles for culturally responsive teaching include, according to Pewewardy(1999) :

1. Teachers use students' prior cultural knowledge as a foundation in the teaching and learning process.
2. Classroom practices are compatible with students' language patterns, cognitive functioning, motivation, and the social norms and structures to which they are accustomed.
3. Assessment practices and procedures reflect the diversity of students' strengths and an appreciation of for multiple intelligences.

4. The attitudes, beliefs, and actions of the school model respect for cultural diversity, celebrate the contributions of diverse groups, and foster understanding and acceptance of racial and ethnic plurality.
5. Teachers value cultural knowledge, view students as assets, and integrate them into classroom instruction.
6. Teachers act as cultural mediators and provide assistance through the use of questions, feedback, and scaffolding.
7. Schooling provides children with the knowledge, language, and skills to function in the mainstream culture but does not do so at the expense of the students' Native language and original cultural orientation.
8. Schooling helps children participate in multiple cultural or language domains (areas) for different purposes without undermining their connection to their original culture.
9. The community and the home validate and support the academic success of the children (p.97)

3. Method

Qualitative research is based on a philosophical grounding stressing the importance of paying attention to process and assuming change is constant and ongoing whether the focus is on individual or an entire culture (Patton, 1990). Action research is defined by Corey (1954) as research undertaken by practitioners in order that they may improve their practices.

Research questions

The two main questions addressed in this project were: How multicultural are our classrooms? and How can we improve our teaching and classrooms by making them more diversity responsive?

Participants

Two groups of early education teachers working in the Midwest in the United States enrolled in the Master of Early Childhood Education program totalling N=21 taking the course titled "Making Early Childhood Classroom Culturally Responsive." One group of teachers (N= 10) participated in 2012 and the second group (N= 11) participated in 2014. All teachers were Caucasian females from the middle class who had previously graduated from the same university. Two of them taught special education classes and one was a reading recovery teacher for children from Kindergarten to 4th grade. One teacher taught in a school for Native children. Two hundred eighty children were involved in these classrooms.

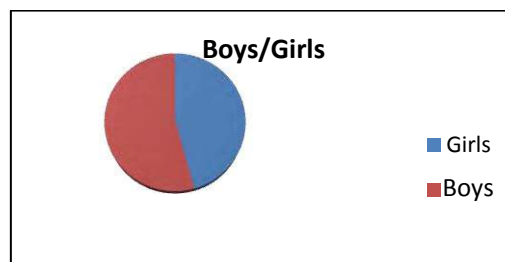
Procedure

For the first step, all teachers evaluated their classrooms using Kendal's (1983) checklist to determine how the classrooms reflected the multicultural character of the country. They watched a video (Nowak-Fabrykowski, 2005) presenting a preschool teacher who described her endeavor to make her classroom culturally friendly, and they read Nowak-Fabrykowski's 2013 paper giving pre-service and in-service teachers' experiences and challenges to implement multicultural education in their classrooms. Both groups read and discussed two books: Suskind, R. (1998). *A Hope in the Unseen; An American Odyssey from the Inner City to the Ivy League* and Rodriguez, R. (1982). *Hunger for Memory; The Education of Richard Rodriguez*. Both groups of teachers visited a museum of Native culture located near to the university. One of the groups watched a movie about a residential school that had existed in the same city where the university is located. Each teacher came up with strategies to implement multicultural education based on her curriculum and developmentally and culturally appropriate strategies for her particular group of children.

4. Results

Contextual factors play a big role in this endeavor, since the place where this particular university is located has not-very-diverse population, except for Native American children who may attend either public or local Tribal schools. This situation is unusual, and the nearby universities have a more diverse environment. Teachers divided diversity in their classrooms into four categories, gender, culture, children with special needs, and poverty. Some teachers reported that, unusually, most of the children even lived with both parents, some lived with grandparents, and this also creates diversity. In total, 280 children participated in this project; 132 preschoolers, 84 kindergarteners, 26 first graders, 21 fourth graders, and 24 children in two special needs classes. In addition, some of the children in regular classes were also identified as having special needs. In regular classes there were children with speech impairments, physical impairments, vision impairments, and those with symptoms along the autism spectrum, and/or children with ADD or ADHD totalling 57 children (20.4%). All together there were 81 with special needs in 21 classrooms.

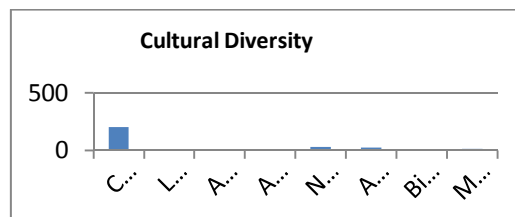
Figure 1. Number of boys and girls. N=280



There was very little gender diversity as reported by the teachers, as there were 152 boys and 128 girls in 21 classes.

The twenty one teachers participating in this project identified many different types of diversity such as gender, socioeconomic, cultural, and developmental, including children with special needs.

Figure 2. Cultural diversity among students. N=280



There was very little visible diversity in the 280 child population: 32 Native children (11.4%), 25 African American children (8.9%), 10 Latino children (3.6%), 6 Asian children (2.1%), 2 children from the Mid-East (0.7%), 8 Biracial children (2.9%), and 17 Multiracial children(6.1%).The cultural diversity comprised 75 children of color, that is 26.8%.

Only 12 children (4.3%) were born outside the USA; one child in Mexico, one in Yemen, one in India, one in Croatia, two in Honduras, and six in Korea. Also most of the children were born in the state where they attended school and this research project was conducted. Only 10 children (3.5%) were born out of state: one in New York, one in California, one in Kansas, one in Wisconsin, one in Florida, one in California, one in Arizona, one in Georgia, one in Virginia, and one in Ohio.

Table 1. Parents heritage

Country of heritage	Number of parents (mother or father)
Africa	25
Belgium	5
Canada	13
Croatia	1
Denmark	2
England	19
Finland	1
France	16
Germany	12
Holland	1
Honduras	2
Hungary	3
Ireland	15
Italy	9
Mexico	8
Nederland	3
North Korea	3
Poland	14
Russia	4
Saudi Arabia	2
South Korea	3
Scotland	15
Sweden	2
Switzerland	2
24 countries	Reported by 180 parents

The teachers reflected on the economic diversity of their student populations, since many of the children are on free or reduced lunch, meaning that their parents lived at or below the poverty level. In one case, all the children in the classroom were in the Head Start program, and their parents were receiving financial assistance. That indicates that all of the children fall into low socio-economic category.

Kendel's (1983) multicultural checklist is mostly helpful in assessing preschool environments, so the teachers from higher grades used only some elements of it, including multicultural books, different types of families, posters that represented diversity, and dolls and toys representing different cultures.

All teachers purchased multicultural crayons (with multiple flash tones) and children started using them while making self-portraits or when they drew their family pictures. One kindergarten teacher read to children *The Crayon Box that Talked* and asked children to draw their portraits. Next she read *I Love My Hair* and traced their bodies on pieces of paper, had the children color them, and discussed the differences and similarities and how important it is that they are different. The teachers also added different types of clothing in the dress area and added foods that represented different cultures such as tacos and sushi. During music time teachers added instruments from around the world like lima shakers, ukuleles, flutes, djembe drums, claves, animals clackers, and pan pipes. The children drew self-portrait using the multicultural crayons, and the teachers displayed them in the classrooms with special notes about each child's holiday foods, special celebrations and traditions, family games and events, family background, etc. The newsletters sent home included photos depicting children from different cultures and dressed in different types of outfits. For the dramatic play area teachers brought different hats, scarfs, outfits and clothes. Many parents gave items representing their culture.

One of the teachers reported that at her school two years ago they implemented Chinese Immersion Language program and all children learn Chinese so she build on this foundation to introduce other Chinese cultural elements. The teachers started looking for toys and games from different cultures.

They were able to invite many parents from different cultural background to talk to children about their heritage and to play some games with them. Some teachers brought to the classroom globes or maps of the world, and children marked the countries of their ancestors.

5. Conclusion

Teachers are the most important school-based resources of equity (Orfield, 2014).

According to the teachers, it is not possible to teach about Mexican using American-Mexican culture etc., or allow tokenism, meaning to use only one book to represent a particular culture. The multicultural classroom must depict people with different aspirations from different sociocultural levels, with different occupations. Teachers commented that it is important to recognize one's prejudices and/or stereotypes to manage a successful multicultural classroom environment. Teachers must reflect on their beliefs regarding poverty, gender and race. As Orfield (2014) stresses, educators need to invent ways to see and use diversity as sources of wealth and invent ways to see and use our diversity as sources of wealth and cultural and linguistic richness, not as a problem: "Remember we are influencing the children who will be making decisions about our communities in the future" (p.288). The teachers in this research project stressed that their goal is to create culture and acceptance, and they will be further developing their ideas and carry on multicultural activities and projects in the future.

References

- Athanases, S. (1999). Building Cultural Diversity Into the Literature Curriculum. In Hollins, E. & Oliver, E. (Eds.) (1999). *Pathways to Success in School. Culturally Responsive Teaching*. N.J: Mahwah: Lawrence Erlbaum.
- Banks, J & McGee Banks, Ch. (2007). *Multicultural Education. Issues and Perspectives*. MA: Wiley.
- Bredecamp, S. & Copple, C. (1997). *Developmentally Appropriate Practice*. Washington: NAEYC #224.
- Corey, S. (1954). Action Research in Education. *The Journal of Educational Research*, 47(5) 375-380
- Drake, T. (2014). The Effect of Community Linguistic Isolation on Language-Minority Students Achievement in High School. *Educational Researcher*, 43(7) 327-340.
- Hauser, B. (2011). *The New Kids. Big Dreams and Brave Journeys at a High School for Immigrant Teens*. NY, New York: Free Press.
- Kendall, F.E. (1983). *Diversity in the Classroom: A Multicultural Approach to the Education of Young Children*, New York: Teachers College Press.
- NCCP (2014). *Child Poverty*. National Center for Children in Poverty, New York: Columbia University: School of Public Health, Department of Health Policy and Management.

- Nowak-Fabrykowski, K. (2012). An application of the "Seven Steps in implementing multicultural education in Preschool and Kindergarten." *Issues in Early Childhood*.3 (18)29-36.
- Orfield,G.(2014). Tenth Annual Brown Lecture in Educational Research. A New Civil Rights Agenda for American Education. *Educational Researcher*,43(6)273-292.
- Patton,(1990). Qualitative evaluation and methods (2d ed.) Newbury Park, CA: Sage.
- Pewewardy,C.(1999) Culturally Responsive Teaching for American Indian Students. In Hollins, E.and Oliver, E.(1999). Pathways to Success in Schools.NJ: Lawrence Erlbaum.
- Perez,Ch.(2014).US Has Highest Percentage of Immigrants in 93 years. *New York Post*.
- Rodriguez,R.(1982).Hunger of Memory. The Education of Richard Rodrigues" New York: Bantam.
- Stake,R.(1978).The Case Study Method in Social Inquiry. *Educational Researcher*,7(2),5-17.
- Suskind,R.(1998). "A Hope in the Unseen. An American Odyssey from the Inner City to the Ivy League" New York: Broadway Books.
- Taylor,L.and Whittaker, C.(2009). *Bridging multiple worlds. Case studies of diverse educational communities*(2 Ed.)New York: Pearson.
- Treuer,A.(2012). Everything You Wanted to Know About Indians but were Afraid to Ask. Minnessota Historical Society: Borealis .

IMPROVING STUDENT ENGAGEMENT AND PROFESSIONAL COMPETENCY BY USING SIMULATIONS IN LAW SCHOOL COURSES

Todd Brower

Western State College of Law (USA)

Abstract

Professional degree programs (law, business, medicine, etc.) straddle two worlds: instruction in traditional academic knowledge and abstract principles, and education in and inculcation with professional skills and practice methodologies. The 2007 Report of the Carnegie Foundation for the Advancement of Teaching, *Educating Lawyers*, criticized American legal education for not teaching law students to develop professional competence and identity, while focusing too much attention on legal principles and theory. The balance of coursework in law schools has typically been weighted towards the latter and away from the former. Further, these two areas are often divided into distinct fields: doctrinal courses and clinical experiences. In my institution, this separation leads to limited student engagement in learning basic principles, as students perceive abstract knowledge to be far removed from the concrete demands of the profession and practitioners' needs. The problem is exacerbated in student populations who, because of prior educational background or experience, have difficulty translating theoretical knowledge or models into tangible, specific professional situations and skills. This presentation will explain some uses of simulations and methods for reengaging students in their traditional doctrinal courses, helping them bridge the gap between theory and practice, and increasing their professional competence and identity.

Keywords: *professional education, pedagogy, student engagement.*

1. The problem

United States law schools walk an uncomfortable line. On one hand they are professional schools; training students to be attorneys and to practice law. On the other, they are graduate educational institutions, giving an advanced academic degree after the first university degree.[1] The predominant mode of teaching is question and answer according to the case method, in which students read appellate court cases and the professor interrogates students on the holdings and principles derived from the cases.[2] Developed at Harvard Law School in 1871, it has changed remarkably little in the intervening 140 years.[3] By that method, the student is supposed to develop a sense of both how cases are constructed and how the law develops from one precedential appellate court decision to others. Through this process students are said to learn to "think like a lawyer." [4]

One problem has always been that students read only upper-level cases and are exposed to legal theory, but they neither learn the skills to achieve what actual lawyers do in everyday practice, nor do they read and employ cases as tools to accomplish specific results as is required by the demands of clients and others.[5] This problem is exacerbated by the fact that in their last two years of law school, students have generally mastered the skill of reading and analyzing cases in an academic manner, but upper-level courses continue to use the same case method of professor-led Socratic dialogue.[6] Without the need to push their skill-set further, and surmount new challenges, students become disengaged from their studies. They graduate unprepared to join a profession that demands skills other than case analysis and the other academic proficiencies learned in law school.[7] Nor do they take advantage of the luxury of learning in a classroom and fully avail themselves of the opportunity to study unhindered by the demands of practice.

Over the years a number of reports and proposals have sought to change this dynamic.[8] Clinical legal education, in which students work with supervising attorneys to represent (typically indigent) clients, can provide some opportunities for students to learn concrete lawyering skills.[9] The problem has always been that legal clinics are limited to very few course units out of a student's total course load and are only taught in legal subjects where the professional clinician has expertise. Moreover, because of the time and supervision of a small number of students per faculty clinician, they consume very significant school resources. Accordingly clinical courses are not widely available to all students and where they are, they may not correspond to students' areas of interest.[10]

2. Simulations

2.1. Why simulations?

Simulations are mock legal problems that ape an actual concrete legal issue that a lawyer might face in practice. They are not live-client experiences and have been written to achieve concrete pedagogical goals set by the instructor, not by the vagaries of legal practice.

Essentially I had four goals for this solution. First, I wanted something portable, i.e., a structure that could be adapted to various subject matters and/or courses. That way, no matter what subject I was teaching, I could employ these methods to help resolve some of the problems listed above. Additionally, practical skills should translate across subject matters for students. They needed a skill set that could be applied with various degrees of modification in whatever fields they happened to practice.

Second, I wanted to reengage upper-division students in their law school experience and especially in my classes. I needed to trigger the intense learning curve found in the first year experience and thus force them to rise to the challenge of learning new material in a manner that would require them to think about law as a way to help people solve specific problems. New challenges spur creative thinking and reengagement. Simply providing the same case methodology provided few novel hurdles at this point in their law school career. Moreover, it reinforced a passive understanding of law as something that other people did and that students only read about. Finally, this passive understanding of principles and cases, often led to the conclusion that students understood more about an area than they actually did. It is the law school corollary to learning a foreign language and then listening to someone else speak it. Relatively quickly, you can get the gist of what they are saying. And so you believe that you have gained more knowledge than you truly have. But it is not until you must speak back and fully participate in the conversation, that you realize how much more you still have to know.

Third, I needed to supply students with a better introduction to the skills necessary for practice after graduation. Unlike many other countries' legal education systems, American law students do not article, clerk, or serve an apprenticeship period before practice.[11] They may take a state's bar examination after law school. And if they pass it, they are certified to represent clients in all aspects of practice, from drafting documents, wills, representing clients in court and in any field of law – all without further study or barriers. As an ancillary goal, I wanted them to begin to think of themselves as members of the profession, rather than as students learning doctrine. Doctrine is useful and necessary, but it is instrumental and not terminal. It is a tool that serves members of the profession and not the final product. Kerper noted: "[A]s every practicing lawyer knows, clients do not present themselves in lawyers' offices with well-defined fact patterns, clear adversarial positions, or precisely formulated objectives or goals. In short, real-life clients look nothing like appellate cases." [12]

Finally, although true clinical education might be seen as the gold standard to instill professional behavior and competencies, it is both expensive and limited in the ways I outlined above. I wanted to provide a bridge between the traditional classroom experience and the clinical setting. Accordingly, I developed the following simulation approach.

2.2. The structure of the course simulations

In order to deal with the lack of student engagement and to help prepare them to start their professional lives after law school, I structured my Employment Discrimination Law class differently from the normal lecture course. For a class of 16-20 students, I divided the students into four different law firms, named A-D. Students were randomly assigned to a firm and did their written and oral work as a single entity. I also divided the course material into projects that spanned four 1.5-hour class sessions running over a consecutive two-week period. This necessitated reducing the coverage of material in the course, but increased the depth and sophistication I demanded of students. I chose material from each of the major sections of the course to compensate partially for lack of in-class coverage.

Each project had four components and each law firm had primary responsibility for a different component of each project. Those responsibilities shifted for each project so that at the end of the semester each group would have had responsibility for each of the various components at least once. Each 1.5-hour class covered one component of a project, so that over the two-week project each law firm would be the major contributor one session and have secondary or supporting roles during the other three classes. This ensured that each student and each group had primary responsibility in each of the four skills and provided enough variety to retain student interest. Because the law firms cycled through each of the areas, students got enough novelty to push their boundaries for learning, and still have enough repetition to reinforce skills being taught.

The components in each project shared certain basic similarities, but varied in particulars according to the specific demands of the project outcome. The first component was a set of readings, appellate cases, journal articles, etc. that described the subject matter and legal principles to be used in

resolving the project. The group responsible for that week needed to synthesize and present that material to the others. The other groups also read the material and were required to submit and ask questions and actively participate in the class discussion. This was the session most like the traditional law school class. However, the students were responsible for presenting the material and teaching it to the class and were not merely passive note-takers. At the end of the hour, the professor told the students who would be coming to the next session to be interviewed and a brief mention of the specific topic.

As an illustration, students might read the major cases and a section of treatise material on the Bona Fide Occupational Qualification [BFOQ], a doctrine that allows an employer an exception to the prohibition against discrimination on the basis of sex or national origin. For example, a French restaurant might hire only male waiters that were native Frenchmen because it was necessary to the essence of the business to have that authentic bistro atmosphere.

The second component involved fact gathering from a mock client, played by myself or another faculty member. The client had a confidential packet of information that the primary law firm was supposed to elicit through the fact gathering process. The client also came to the law firm with a concrete problem or goal to be accomplished for the project. In this component, the skills involved were interviewing and factual investigation, how to talk to clients and to gather information in a manner that was be useful, efficient and would build confidence with the client or other interviewee (e.g., witness, expert). The other students took notes and could suggest follow up questions at the end of the session. They were also tasked with critiquing the performance of the primary group, to serve as feedback for the interviewers on techniques, skills, and the more intangible aspects of client contact.

In the BFOQ illustration, students interviewed the owner of a business, The Lovely Lady Health Spa, who wanted to hire only women to work in his female-only health club. All employees, from reception staff, to personal trainers, to accountants, to janitorial or cleaning staff would be women. Students would need to use the criteria discussed in the cases to ask appropriate questions about job duties, hours, contact with female clients in order to make an informed decision about the availability of the BFOQ defense and to give the client advice on its possible success, to assess the strengths and weaknesses, and to figure out how to proceed accordingly.

The third component was centered on discussing how to best meet the needs of the client in the form required by the project. For example, if an evidentiary motion needed to be filed in court as the outcome of the project, the primary group presented the requirements for that motion and any additional documentation, etc. Tactical considerations and practical issues were also part of the discussion. If there were issues that were unclear in light of the problem and occurring as a result of the prior components, those issues could be discussed here as well.

Once again, in the BFOQ example, students talked over the strengths and weaknesses of the application of the BFOQ doctrine to each of the job categories and strategized about how to approach the client and/or structure the business to best accomplish the client's goals within the strictures of the law and existing cases. They also discussed the purposes, formal requirements, and potential pitfalls for a "client letter" – a particular form of legal advice or legal opinion sent to a client in response to a question like in the Lovely Lady scenario.

The fourth and final class session/component was a presentation of the required written work product (e.g., the motion, client letter, pleading). All law firms drafted a written work product and submitted it to the professor. However, the primary law firm for this component also submitted their written work to the other firms/students for their evaluation and critique. The class discussion focused on the primary group's written work and they had to defend and explain the choices they made and the difficulties they encountered in making their decisions. Because all groups had also produced written work, they compared and contrasted their solutions to the issues raised by the project. In essence, the primary group's work served as a foil for the discussion of the various ways in which different lawyers might resolve and handle the same problem.

In the BFOQ problem, the client letter drafted by the primary group was distributed to all students before the class session so that the other groups could compare that letter to their own versions. In class conversation centered on why students in the primary group made the decisions they did in their client letter, their choice of language to communicate with the client, particularly if there were negative opinions expressed as to the possible legality of the client's proposed actions. They also discussed what alternatives they proposed and rejected, and why those decisions were made. Students in the other groups then shared their written solutions to these same problems and all participants debated the positives and negatives, the risks and rewards of the common task, and the groups' various client letters.

One common aspect of all components was that students needed to stop thinking of cases and legal doctrine as abstractions, but as implements to accomplish other tasks. Once they realized that they would have to use and apply those concepts to solve a concrete problem, the details and mechanics of how exactly doctrine worked became significant. Moreover, the interrelationships between other legal

courses they had taken and this particular class became important, since in order to file an evidentiary motion, for example, one needed to know what the rules of evidence require and the civil procedure requirements for motion practice.

Another common trait of all components was that much student learning occurred outside the classroom and away from the professor's direct guidance. This helped control some of the passivity students sometimes exhibited in the traditional classroom experience. In that realm, the students serve as docile receptacles into which the professor pours knowledge. Here, in contrast, the students lead discussions and have key accountability for teaching their peers. This is especially striking in the first component, the one that most closely mirrors the typical law school pedagogy. As anyone who has taught a class can attest, one really figures out what a subject is when one must teach it to others. This new challenge provokes student learning beyond the strict limits of the readings provided.

3. Extrapolation to Other Disciplines

It is unlikely that the particular constellation of problems in American law schools is replicated to the same degree in other disciplines or in other countries.[13] Nevertheless, many of the same issues faced in my school are common across educational institutions.[14] Student disengagement and passivity undermine classrooms in other than American law schools. Creating novel experiences and opportunities for student leadership roles helps counter those weaknesses.

Further, treating students as fledgling experts and new entrants in their discipline begins to inculcate professional values and mores as well as particular abilities and skills.[15] While directly relevant to other institutions like medical and business schools, other academic departments with institutional standards face similar challenges as to how to train young persons in the canons and touchstones of professionals in the field, when those young persons are not yet fully credentialed or licensed or have not yet begun their careers.

References

- [1] Sullivan, William M, (2005). *Work and Integrity: The crisis and promise of professionalism in America* (2nd ed.); Maxeiner, James R., (2007). Educating Lawyers Now and Then: Two Carnegie Critiques of the Common Law and the Case Method, *International Journal of Legal Information* 35: 1; Miller, Nelson P. (2008). An Apprenticeship of Professional Identity: A Paradigm for Educating Lawyers, *Michigan Bar Journal* 87: 20.
- [2] Sullivan, William M, Colby, Anne, Wegner, Judith Welch, Bond, Lloyd, and Shulman, Lee S., (2007). *Educating Lawyers: Preparation for the profession of law* (The Carnegie Foundation for the Advancement of Teaching, Preparation for the Professions Program).
- [3] Sullivan, William M, Colby, Anne, Wegner, Judith Welch, Bond, Lloyd, and Shulman, Lee S., (2007). *Educating Lawyers: Preparation for the profession of law* (The Carnegie Foundation for the Advancement of Teaching, Preparation for the Professions Program).
- [4] Maxeiner, James R., (2007). Educating Lawyers Now and Then: Two Carnegie Critiques of the Common Law and the Case Method, *International Journal of Legal Information* 35: 1; Gantt, Larry O. Natt (2007). Deconstructing Thinking Like a Lawyer: Analyzing the Cognitive Components of the Analytical Mind, *Campbell Law Review* 29: 413.
- [5] Kerper, Janeen, (1998). Creative Problem Solving vs. The Case Method: A Marvelous Adventure in Which Winnie-the-Pooh Meets Mrs. Palsgraf, 34 *California Western Law Review*. 34: 351.
- [6] Sullivan, William M, Colby, Anne, Wegner, Judith Welch, Bond, Lloyd, and Shulman, Lee S., (2007). *Educating Lawyers: Preparation for the profession of law* (The Carnegie Foundation for the Advancement of Teaching, Preparation for the Professions Program).
- [7] Dopierala, Jessica, (2008). Note: Bridging the Gap Between Theory and Practice: Why Are Students Falling Off the Bridge and What Are Law Schools Doing to Catch Them?, *University of Detroit Mercy Law Review* 85: 429.
- [8] Sullivan, William M, Colby, Anne, Wegner, Judith Welch, Bond, Lloyd, and Shulman, Lee S., (2007). *Educating Lawyers: Preparation for the profession of law* (The Carnegie Foundation for the Advancement of Teaching, Preparation for the Professions Program); Maxeiner, James R., (2007). Educating Lawyers Now and Then: Two Carnegie Critiques of the Common Law and the Case Method, *International Journal of Legal Information* 35: 1.

- [9] Dolin, Jason M. and Distelhorst Michael, (2008). Clinical Experience Essential Part of Legal Education ("Mending Legal Education" series), *Ohio Lawyer* (May/June); Milstein, Elliot S. (2001). Clinical Legal Education in the United States: In-House Clinics, Externships, and Simulations. Papers on the La Pietra Conference of International Legal Educators, *Journal of Legal Education* 51: 375.
- [10] Dopierala, Jessica, (2008). Note: Bridging the Gap Between Theory and Practice: Why Are Students Falling Off the Bridge and What Are Law Schools Doing to Catch Them?, *University of Detroit Mercy Law Review* 85: 429.
- [11] Dopierala, Jessica, (2008). Note: Bridging the Gap Between Theory and Practice: Why Are Students Falling Off the Bridge and What Are Law Schools Doing to Catch Them?, *University of Detroit Mercy Law Review* 85: 429.
- [12] Kerper, Janeen, (1998). Creative Problem Solving vs. The Case Method: A Marvelous Adventure in Which Winnie-the-Pooh Meets Mrs. Palsgraf, 34 *California Western Law Review*. 34: 351, at 353.
- [13] Dopierala, Jessica, (2008). Note: Bridging the Gap Between Theory and Practice: Why Are Students Falling Off the Bridge and What Are Law Schools Doing to Catch Them?, *University of Detroit Mercy Law Review* 85: 429.
- [14] Kerper, Janeen, (1998). Creative Problem Solving vs. The Case Method: A Marvelous Adventure in Which Winnie-the-Pooh Meets Mrs. Palsgraf, 34 *California Western Law Review*. 34: 351; Miller, Nelson P. (2008). An Apprenticeship of Professional Identity: A Paradigm for Educating Lawyers, *Michigan Bar Journal* 87: 20.
- [15] Sullivan, William M, Colby, Anne, Wegner, Judith Welch, Bond, Lloyd, and Shulman, Lee S., (2007). *Educating Lawyers: Preparation for the profession of law* (The Carnegie Foundation for the Advancement of Teaching, Preparation for the Professions Program).

PROBLEM SOLVING AS PROGRAM CODE DESCRIPTION

Edward Brown

Memorial University of Newfoundland (Canada)

Abstract

This paper addresses a common instructional problem in college-level computer courses: that students complete assignments without engaging the instructional content relating to problem-solving. Solutions on the Internet provide a close match when an exact solution cannot be found; thus avoiding the struggle to engage new problem-solving skills and develop new learning strategies. Even general meta-cognitive and self-regulated learning strategies such as canvassed by Falkner et al (2014) depend on domain-specific knowledge (Winne, 1995). It is suggested that the narrow definition of problem-solving in the computer programming discipline obscures the kind of problem-solving implicit in such strategies. After contrasting notions of problem-solving inside and outside of the field of computing, a pedagogical approach to improve student learning behavior is offered. Emphasis is shifted away from the text of computer code solutions, towards student description and assessment of computer code solutions. Students provide their descriptions in a combination of natural language and Unified Modeling Language. Thus, the separation between design and implementation identified by Falkner et al (2014) is addressed, and the Internet no longer serves as a compendium of pre-packaged solutions. Informal observations regarding a one semester application of this approach conclude the paper.

Keywords: *Problem-solving, Programming, Pedagogy, Computer Science.*

1. The Internet Strategy

Students have been practicing Internet skills for most of their lives; whereas learning a new problem-solving strategy and trying to apply it to assigned school work may be an inherently bad approach from the student's point of view: difficult, time-consuming and prone to failure. Searching the Internet for a completed answer that is a close enough fit to the problem is quicker, more efficient and likely to be more successful. Circumventing new intended or incidental learning may not be terribly relevant if the student's personal objective is effective and efficient performance rather than learning.

Domain-specific knowledge is prerequisite to applying self-regulated learning strategies. (Winne, 1995). Veenman et al, (1997) note that novices are “restricted by a poor working method which stems from a lack of domain-specific knowledge” (p.188) and they resort to a cycle of ‘impasses and local repairs’ without specific strategies to tackle conceptually difficult problems. They tend to delay problem solving until absolutely necessary, resulting in a need to rely on a general mega-strategy that can solve their entire problem in one operation. Given this tendency, it is not surprising that students would retreat to using the Internet as a compendium of solutions in preference to decomposing and analyzing an unfamiliar programming problem.

In computer programming, the quality of software submitted is the measure of competence. We might tell our students not to use the Internet, or encourage them to seek out solutions independently, but it is unclear exactly what these instructions are intended to limit. It seems reasonable for students to seek alternative explanations of course topics, or review elements of a problems already discussed. Indeed, in industrial or working environments, on-line communities provide solutions and colleague helpers. Programmers would be expected to use these resources. (Treude, 2011)

There are advocates of unconstrained access to the Internet. Professor Sugata Mitra, (Mitra, 2015) for example, has popularized the concept of minimally invasive education. This includes encouraging students to develop their own learning strategies in an environment enriched with materials (particularly Internet access) and with minimal instruction.

The debate around Internet use is partially a question of evaluation. If performance is about a good problem solution, then access to the Internet should be a non-issue; only the quality of the student solution is relevant. If the solution or answer is used to assess the student's independent competence or comprehension, then allowing the student to tap a community of knowledge is problematic. However

unique the assigned problem, the global community can eventually satisfactorily mimic individual learning. This is poignant in Computer Science, which relies on canonical problems that are easily encompassed with solutions on the Internet.

2. An example from canon

An early problem in computing curricula is *sorting*; it is part of the implicit canon of knowledge in Computer Science, and introduces both programming and algorithm design, two problem-solving contexts within the discipline. A typical statement of the sorting problem is: “*Write a program which takes an arbitrary sequence of integers as input, and outputs the same integers in ascending sequence*”. Explanations, solutions and program code for solving this problem are replete on the Internet, easily producing a computer program without studying or understanding the problem. (While this is in principle true regarding textbook sources, searching tools make the Internet a more attractive option.)

As a problem in algorithm design, solution strategies for sorting should be compared and contrasted. However, even less popular solution strategies (such as the ShellSort algorithm, cf. Sun Microsystems, 2008) have exhaustive source material and solutions on-line.

A “canon” or “core” of well known problems and solutions (such as the sorting problem) comprises essential knowledge implicit in the discipline of Computer Science, representing a set of known solution strategies for the well-informed programmer to draw upon. But this does not address the problem-solving skill of composing programs, something considered outside the discipline.

3. Kinds of problem-solving

What is missing is a focus on the student's problem-solving competence. This paper suggests this is at least partly due to the characterization of problems and solutions in computer science, which creates ambiguity around the term *problem-solving*.

In the previous example, the problem was sorting, and the solution was embodied in a program. This is typical of the definition of a problem in computing: a problem is defined as a specific algorithm or program to transform of a sequence of symbols (input) to another sequence of symbols (output). The symbols are interpreted to mean something – a series of number, facts, or other abstract concepts - or they are wired up to transducers or sensors to interact with the “real” environment. In either case, the solution is the program.

But a program is not just a single solution; it can transform any valid input sequence. In other words, it embodies a solution-strategy for a problem, such as the sorting problem. Furthermore, a program as a solution artifact is self-describing: as a set of program instructions, it can be read and understood by a computer, but also can be read and understood by humans. This makes it difficult to distinguish the artifact (code or algorithm) from the act, process or skill of creating the artifact. To an evaluator or grader a program needs to solve more than a specific sorting sequence (what computer scientists call a problem instance), but correctly solve all such sorting sequences. Therefore, we infer the student has applied and internalized a problem-solving strategy: otherwise, the student could not have produced the program.

This inference obscures a crucial fact: the problem-solving needed to create a program/software is distinct from the program-solving expressed by the program/software. Although there are attempts to relate the two (cf. Robillard, 1999), this author considers such attempts conflated. An analogy can be made between a computer program and a mathematical formula. We can learn to apply a known formula (what a program does); but creating a new formula (what a programmer does) is a different kind of task. When Lichtinger and Kaplan (2011) claim self-regulated learning strategies are domain specific, they are not referring to the strategies computer programs use to transform input into output (which are also domain-specific).

An important distinction between the mechanical operation of a program and the creativity of a programmer is that successful student programmers develop their own individualized and idiosyncratic application of problem-solving and learning strategies (Caruso, 2011). In addition to domain specific skills, Bergin et al (2005) provide evidence of connection between general meta-cognitive strategies and computer programming performance. Falkner et al (2014) adduce self-regulatory skills computing students need to learn computer programming, such as planning, time management, identifying sub-goals, problem decomposition, task difficulty assessment, knowledge building, as well as meta-strategies such as strategy assessment. They also cite the ability to separate program design from program coding activities as a computer programming skill.

4. Instructional approach

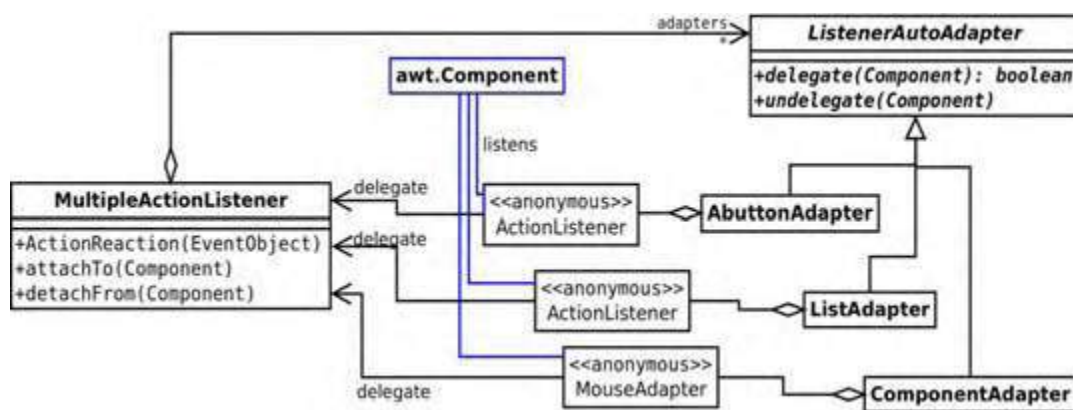
One approach to improving meta-cognitive learning skills, self-regulatory skills and development of problem-solving strategies would provide curricula and direct instruction for those objectives. Allwood (1986) suggests scaffolding techniques to help students to explore new solution strategies instead of relying on familiar but inappropriate knowledge. The approach described in this work is less ambitious; partly because no position is adopted on the appropriate learning theory, which also means relevant techniques and evaluation metrics are not determined; and partly because the author had no mandate to alter course curricula. This approach attempts to motivate behavioral changes and the utility of web-searching as a solution strategy by adjusting assignment criteria and grade rewards.

This approach has two elements: (1) performance evaluation is shifted away from software artifacts and towards explanation and description of those artifacts and (2) students are required to express solutions in a form different than they can readily find on the web. This intentionally separates the creation or design of a solution from its expression as program code. The following or a similar address to students is repeated during the course: “*Unlike other programming courses you may have done, I don't care how you get the code you use, as long as you have permission and you attribute it appropriately in compliance with copyright and other legal requirements. While you might benefit more from composing your own, you can get code from friends, off the Internet or even purchase it. The quality of the code you submit is important, but your evaluation will be based on the understanding and explanation of the code provided in your submission. I will be calling this aspect of submission the code design.*”

In itself the emphasis on design or an abstract description of program code is not innovative. High level description of software design is essential in advanced computer subjects such as software architecture. The innovation is reducing emphasis on the code submission as evidence of programming skill, and emphasizing the design description, even in more introductory courses where it is not usual. As pedagogy, this draws on recent published observations that studying (or “reading” code) produces many of the learning outcomes previously thought to require hands-on composition of code. (e.g. Corney et al, 2011)

Under this approach, students are required to describe their programs in three forms: natural language (English), diagrammatically in Unified Modeling Language (UML), and using program code. Requiring this description serves two purposes: first, the students cannot rely exclusively on material gleaned from web-solutions, since these descriptions are not available on line; they have to be created. Second, the act of translating or articulating the key ideas of the code solution in a different form impels the students study and understand those key ideas.

Figure 1. A UML diagram of a code solution that was critiqued with students. Diagram illustrates one particular design concept used in the coded solution. Students use similar diagrams in their own submissions.



Natural language and UML descriptions of software are again not original in themselves: students would eventually be instructed in their use at some point in any academic degree stream for computer programming. The difference is to treat these tools as a way to establish student comprehension of the academic material, rather than as part of the material themselves.

Work in concept mapping (Gowin and Novak, 1984) supports the belief that students are forced to engage and reify new knowledge when they have to express textual material in a different (diagrammatic) form. This has been applied for diagnosing student misconceptions (Sanders 2008) and for teaching programming concepts using UML (Ferguson, 2003; Tabrizi, 2004).

Figures 1 and 2 illustrate the distinction between program code and UML. The more abstract diagrammatic portrayal of code structure is more compact and concise, and requires the author to

selectively portray certain aspects of the code. Deep understanding of the coded solution is required to select the parts that are important and diagram how they interact with one another. UML does not effectively convey all the nuanced details or abstractions that may contribute to a solution, and for these the students are encouraged to use natural language and program code; but even in this latter case, the choice of what form of description to adopt requires insightful analysis of the coded solution.

Figure 2. Part of the code solution represented in figure 1.

```
/**
 *
 * This adapter sticks to any component and captures mouse click events.
 * This should be the last one tried.
 * @author brown
 *
 */
class ComponentAdapter implements ListenerAutoAdapter {
    MouseAdapter adapterToDelegateListener;
    public ComponentAdapter() {
        adapterToDelegateListener = new MouseAdapter() {
            @Override
            public void mouseClicked(MouseEvent e) {
                MultipleActionListener.this.actionReaction(e);
            }
        };
    }
    @Override
    public boolean delegate(Component j){
        j.addMouseListener(adapterToDelegateListener);
        return true;
    }
    @Override
    public boolean undelagate(Component j){
        j.removeMouseListener(adapterToDelegateListener);
        return true;
    }
}
```

5. Discussion

The described approach was piloted in a third year course titled “COMP3718: Programming in the Small” at Memorial University, Canada during the first semester January-April of 2015. Empirical data was not specifically collected, but some general subjective observations are offered.

In comparison with previous offerings, there is no direct evidence of improved performance, learning or student satisfaction with the course or instruction: student marks and satisfaction measured on feedback forms are comparable to previous offerings. Instead, the chief observation is that many students had difficulty adjusting to the shift in evaluation criteria. At mid-term, (after half the assignments were completed), some students' comments on their assignment evaluations still showed no adjustment in orientation. A paraphrase of one comment is “My code works perfectly, so I don't understand how I can have a fail on the assignment”. Similarly, a student who lost marks for inadequate explanation wrote “How do you know I didn't do that?” The point that the scheduled marks were for explanation of the code had not been grasped.

These students are still expecting grading based on the quality of their programming code, despite published marking schemes and repeated explanations during lecture periods. In personal communication reviewing this issue with students, many agreed with the suggestion that their expectations were driven by experience in prior courses. An alternative suggestion, that students feel personal satisfaction and motivation regarding programming code and not from additional descriptions, was not generally accepted by those interviewed. A further unprompted comment from several students was that the course was challenging in ways they did not anticipate, and in particular that they had difficulty “finding examples on the Internet”.

This latter comment gives some hope that the approach is achieving its material purpose of removing the Internet as a compendium of solutions. The former comments and performance outcomes indicate that additional effort may be needed to shift student expectations regarding evaluation. The following modifications are planned for future instruction: (1) some assignments which involve NO coding, only description of existing code, will be used to prime student expectations (2) specific introduction to evaluation schemes (3) an example of a completed and graded assignment will be provided early in the semester (4) lecture time modeling the practices of describing and evaluating code

will be increased and further integrated into the programming elements of the curriculum. This could now move past a pilot stage, so empirical data collection should be warranted.

As an alternative to directly instructing students in learning strategies, the approach has yet to show success. Its chief advantage in terms of adoption is that it places fewer demands on the curriculum or the instructor, as it requires no adoption of particular theories of learning or instruction in problem-solving or self-regulation. It may be inherently less effective than direct instruction because it provides no specific guidance to the student regarding problem-solving strategies.

If generalization of this approach to subject matter other than computing is warranted, a difficulty is analogizing the act of describing code to some activity in another discipline. The author tentatively suggests that student self-critique and self-evaluation of solutions may provide similar constructs, and the general literature on student self-regulated learning (cf. Lichtinger et al, 2011) could be interpreted as supporting this view.

References

- Allwood, C. (1986) Novices on the computer: a review of the literature. *International Journal of Man-Machine Studies*, 25(6). 633–658.
- Bergin, S., Reilly, R., & Traynor, D. (2005) Examining the role of self-regulated learning on introductory programming performance. In *Proceedings of ICER'05 the first international workshop on Computing education research*. 81-86.
- Caruso, T., Hill, N., VanDeGrift, T. & B. Simon, B. (2011) Experience report: Getting novice programmers to think about improving their software development. *Proceedings of SIGCSE'11 42nd ACM technical symposium on Computer science education*. 493–498.
- Corney, M., Fitzgerald, S. Hanks, B., Lister, R. McCauley, R. & Murphy, L. (2014) Explain in Plain English questions revisited: data structure problems. *Proceedings of SIGCSE'14 45th ACM technical symposium on Computer science education*. 591-596.
- Falkner, K., Vivian, R. & Falkner, N. (2014) Identifying computer science self-regulated learning strategies, *Proceedings of the 2014 conference on Innovation & technology in computer science education, ITiCSE '14*. 291-296
- Ferguson, E. (2003) Object-oriented concept mapping using UML class diagrams. *Journal of Computing in Colleges*, 18(4). 344-354.
- Lichtinger, E. & Kaplan, A. (2011) Purpose of engagement in academic self-regulation. *New Directions for Teaching and Learning, Special Issue on Self-Regulated Learning*, 2011(126). 9–19.
- Mitra, S. (2015). Minimally invasive education: Pedagogy for Development in a Connected World. In Rothermel, P. (Eds.), *International Perspectives on Home Education* (254-277). New York: Palgrave-McMillan.
- Novak, J. & Gowin, D.B. (1984) *Learning how to Learn*. Cambridge University Press.
- Robillard, P.N. (1999). The role of knowledge in software development. *Communications of the ACM*, 42(1), 87-92.
- Sanders, K., Boustedt, J., Eckerdal, A., & McCartney, R. (2008) Student understanding of object-oriented programming as expressed in concept maps. *ACM SIGCSE Bulletin* 40(1). 332-2336.
- Sun Microsystems Inc. (2008). *Shell Sort Implementation in Java*, Retrieved May 4, 2015 from <http://www.java-tips.org/java-se-tips/java.lang/shell-sort-implementation-in-java.html>
- Tabrizi, M.N.H., Collins, C., Ozan, E., & Li, K.(2004) Implementation of object-orientation using UML in entry level software development courses. *CITC5 '04 Proceedings of the 5th conference on Information technology education*. 128-131.
- Treude, C., Barzilay, O., & Storey, M. (2011). How do programmers ask and answer questions on the Web? *Proceedings of ICSE'11 33rd International Conference on Software Engineering*. 804-807. Waikiki: Honolulu.
- Veenman, M., Elshout, J. & Meijer, J. (1997). The generality vs domain-specificity of metacognitive skills in novice learning across domains. *Learning and Instruction*, 7(2). 187–209.
- Winne, P. (1995). Inherent details in self-regulated learning. *Educational Psychologist*, 80(4). 284–290.

EU FOUNDED TEACHER EDUCATION IMPROVEMENTS IN HUNGARY

Krisztián Pálvölgyi, Horváth H. Attila, Éva Bodnár & Judit Sass
Hungarian Institute for Educational Research and Development (Hungary)

Abstract

The developments are discussed in this paper related to the TÁMOP (Social Renewal Operational Program) 4.1.2.B Project in Hungary supported by the European Union. Our task was to facilitate the synergy between development processes of different HEI consortiums related to Central Hungarian and convergence region project components. We were in a very sensitive position: our Institute is not the leader of the project, just the responsible organization for the national coordination component. Finally five major targeted research and development activities have been initiated by our Institute. Concerning our facilitator role the expert groups of HEIs understood the importance of learning outcome based approach deeper through these peer-learning activities. Related to these R&D activities we established an e-database for teacher education researches, and analyzed the image of teacher profession in different countries as well. We also tried to strengthen the position of newly founded teacher training centres in teacher education universities. As facilitators of the interinstitutional dialogue we learned a lot about the nature and functioning of teacher education and teacher educators.

Keywords: *teacher education, learning outcome based curriculum development, teacher trainer's identity, knowledge society, coordination activity*

1. Background

Emergence of knowledge-based society and economy changed our life in many important ways. Creation of new knowledge and innovation become the main engine of economic development. These knowledge production processes require highly developed competences: different experts from different sectors of society must be able to cooperate interdisciplinary and work as a team to solve complex problems. The new knowledge for knowledge society builds upon various sources, organizational diversity and network structures. Interactions between researchers/developers and users become important part of our quality concept, which thus become less academically focused as previously. In this type of society the success and efficiency of learning and teaching is crucial (Allen and van der Velden, 2007; Santiago, Tremblay, Basri and Arnal, 2008). Therefore the emergence of knowledge-based society set a serious challenge to education systems. As we well know the quality of an education system cannot exceed the quality of its teachers (Barber and Mourshed, 2007), thus teacher education is one of the most important elements of an education system for knowledge-based society.

2. Context and strategy of the development

The developments discussed in this paper are related to the TÁMOP (Social Renewal Operational Program) 4.1.2.B Project supported by the European Union. The program itself aims to support methodological and content developments, HEI networking and cooperation in the field of teacher education (TE) as well, as to foster a productive discourse on professional practice of teacher candidates. The project has a Central Hungarian component for TE universities of Budapest and a component for universities of the convergence regions. We need to speak here some Hungary-specific conditions. Since 2010 significant changes have occurred in Hungarian education system and some of these have direct effect on Hungarian teacher training system. The previous two-cycle structure is replaced by an undivided training, which offers a master degree with an expanded, one year school practice. It is another notable change that our new legal regulations oblige higher education institutions (HEIs) with more than two accredited teacher training programs to establish a teacher training centre (TTC). Both policy decisions are now under implementation and our project aims to directly help these developments as well.

The Hungarian Institute for Educational Research and Development has the leading role in coordinating the whole project. Our task is to facilitate the synergy between development processes of different HEI consortiums related to Central Hungarian and convergence region project components. We interpreted this task as a facilitator and moderator role, which aims to make possible the participant TE institutions to share their development experiences, and to present and discuss the results together. We thus organized expert groups from representatives of the involved teacher training universities.

As the responsible for the national coordination component of TÁMOP 4.1.2B our institute has a moderate budget related to the project. We use these financial resources to organize workshops where TE institutions have opportunity to share their own development experiences. In parallel we give TE institutions clear orientations through targeted researches and developments. The mentioned workshops provide an opportunity to disseminate and discuss the results of these targeted tenders as well. This is an important element of our implementation strategy. Due to the autonomy of higher education institutions and the fact, that the consortiums lead their own, mostly independent tenders under the umbrella of TÁMOP 4.1.2B Project, as coordinators we are in a very sensitive position.

Our approach is inspired by implementation models which interpret policy change as synthesis of top-down and bottom-up processes (Sabatier, 2005, Fazekas and Halász, 2005). In this project we tried to give top-down inputs through the targeted researches and developments, but we also created and managed different professional communication forums for participating institutions to bring in and share their own developments, experiences and difficulties.

3. Theoretical consideration behind our coordination activity

Our coordination actions are based on consideration of a broader perspective of European and Hungarian higher education changes. As an EU and EHEA member state Hungary currently implements its national qualification framework. Of course the Hungarian Qualification Framework is based on learning outcome approach, which expects HEIs to apply a new understanding of teaching and learning, and related to that expects them to develop a new, complex way of curriculum design in their study programs, which is different from the traditional solution. According to Adam, learning outcomes are multipurpose tools. At the international level learning outcomes play a central role in translating the qualifications of different member states to a common language and through that help to provide real transparency. At the national level they are tools for describing the national qualification system, and to help improve quality assurance and development through level descriptor based standards. At institutional level they have a vital role in designing the learning-teaching processes, in validation procedures and in quality assurance of study programs as well. As Adam writes: *"learning outcomes are at the heart of a paradigm change that is impacting on all sectors of European education"* (Adam, 2008)

The learning outcome based curriculum design is strongly student and process centered. The first step is to describe the appropriate learning outcomes, which are *"statements of what a student is expected to know, understand and/or be able to demonstrate after completion of a process of learning"* (Kennedy, 2007). According to Biggs, it is very important to ensure the alignment between the intended learning outcomes, the learning activities and the evaluation of the students (Biggs, 2007). The study programs in this approach are aligned, constantly evolving systems with well-designed learning-teaching processes. It is a huge difference compared to a traditional, faculty and course centered approach.

Learning outcomes are usually described through competences. The – more or less fuzzy – concept of competences emerged from the world of human resource management and human resource development (Delamare le Deist and Winterton, 2005). Of course it is not a coincidence. In the knowledge based society the economy has a stronger connection with education than ever before. It means that in certain areas Education has begun to use the terms and concepts of the world of work. It is also unsurprising that in learning outcome based curriculum design the communication and cooperation with the world of work became vital. Thus – if they take the learning outcome approach seriously – HEIs must intensively cooperate with external actors.

It means that individual actors in higher education as well as the whole HE organization must act differently – much more opened and conscious – than before and it hardly affects the teacher education institutions. Therefore – wherever we could – we tried to support these changes through our coordination activity.

4. Questions and difficulties emerged during the project

Probably the first question emerges in a complex teacher education development project is related to the interpretation of teacher education itself. How can we characterize the teacher education? What should be its position in the higher education organization? As we previously mentioned the

complex knowledge production processes in our society based on interdisciplinary teamwork. The teacher education itself can also be seen as a manifestation of these processes. Teacher training is a complex task, because the teacher candidates must be prepared to work for an education system, which meets the demands of today's and even tomorrow's society and economy. Of course teacher education – besides the needs raised by wider social context – must take into consideration the professional and individual aspects as well. This task can only be solved within an intensive interdisciplinary and intersectoral collaboration.

Following from that emerges the next question: what are the main characteristics and organizational needs of a learning outcome based TE program? Teacher education meets the above described requirements only in the case, when we are able to involve other actors of society beside the existing expertise of the TE. As we discussed earlier the knowledge based social context and the learning outcome based approach generally fosters the intersectoral and interdisciplinary cooperation in curriculum design. However teacher education has a unique position regarding to interdisciplinarity. A variety of different faculties necessarily take part in TE activities of a higher education institution. Their work must be well aligned to provide a coherent learning experience for TE students. TTCs – which are according to a new Hungarian legislation operating in Hungary since September 2013 – can have an important role in that coordination. On one hand this means that a TTC needs to organize the TE activities of the concerned faculties within the university organization. On the other hand they have to integrate the knowledge of the non-academic areas which areas involve the world of primary and secondary schools and also a wide variety of affected economic and social groups. In this case these external actors represent the world of work for prospective teachers.

Drótos described the program-director model as the solution for contradiction between the traditional disciplinary oriented structure of universities and the interdisciplinary demands of the knowledge society (Drótos, 2009). The model has two main elements. First it describes a study program as a responsibility and accountability unit. It means, that resources and managerial responsibilities are assigned to program directorates, but also makes them responsible for the use of these opportunities. The second element is the matrix organization structure, which creates the opportunity for organizational units with different specialization principles - in this case for the faculties/departments and the program directorates – to cooperate as equal partners in developing and working on the study program. A Teacher Training Centre can be described as a program directorate for a really complex study program. Of course TTC needs resources, authority and autonomy to operate as equal partner for faculties/departments, and the newly formed TTCs have great issues with that. It is worth to mention here Bela Pukánszky's study (Pukánszky, 2012), who reacted quickly to the TTC establishing regulations. The study shows that a similar system was already organized in the Hungarian higher education in the Early 1900s, which could not work properly due to the lack of new authorities, which are still missing today. As the current legislation itself is quiet laconic, we can identify a variety of solutions in Hungarian HEIs for describing the role of TTCs in the structure of the university organization, but these solutions do not answer the above mentioned essential problem related to resources, authority and autonomy.

As we previously mentioned we are in a very sensitive position. the Hungarian Institute for Educational Research and Development is not the leader of the TÁMOP 4.1.2B project, just the responsible organization for the national coordination component. There is no hierarchical relationship between our institute and the participating TE institutions; we are equal partners in this project, which in our opinion is a good setting for cooperation. Of course that means that we do not have direct influence on the project processes of other participating institutions, or on their inner organizational structure. We must use softer, more sophisticated tools to orient our partners. We created an environment for continuous discussion, and to foster the participating HEIs development processes through different targeted researches and developments.

5. Targeted researches and developments conceptualized by national coordination component

Five major targeted research and development (R&D) activates have been initiated by the Hungarian Institute for Educational Research and Development related to this project. One of these (1) aims to establish and recommend operational standards for TTCs under the leadership of the Hungarian Accreditation Committee. The proposal based on the overview of related international good practices and on the analysis of Hungarian experiences. We expect that as a result of this R&D a clear set of criteria will unfold for the quality development of TTCs and TE study programs they coordinate. If this proposal can prevail, the position of TTCs in teacher education universities likely will be strengthened.

Besides the good functioning teacher education system the images in the society related to teachers and the teaching profession are also important. Thus we launched an R&D, which examined the social perception of teacher profession in different countries, and related to that revealed the strategies

these countries use for popularization of the teacher profession (2). The results can be good sources for the related Hungarian developments of the future.

We also have a leading role in the creation of an e-database for teacher education related researches (3). We would like to collect data about all study programs of Hungarian teacher training universities as well and make this information available through the e-database. The research register besides storing researchable and statistically processable contents, also offers opportunities for networking through creating research and/or training cooperation and for strengthening the relationship between public education and teacher education through the inclusion of public education related contents (e.g. practices, problems and issues).

We initiated a further R&D, in which requested TE institutions examined their own TE study program to find out how the crosscurricular areas represented in Hungarian National curriculum appear in it (4). They all develop strategic plans built upon the results of their self-evaluation, to orient their further developments. The findings and the strategies will be presented and discussed soon at a conference organized by our institute.

The latest legislative changes occurred during our project made it necessary to launch our fifth R+D at the field of vocational education TE as well (5). The initiative aims to reveal the organizational needs related to the new legislation as well as the relation of the institutional level VET curriculums to the national curriculum.

6. Results so far

The previously mentioned five targeted activities initiated by the Hungarian Institute for Educational Research and Development are progressing well. We have recently supplied the first finished background studies related to the R&D aims to establish operational standards for TTCs. The international analysis of social perception of and popularization strategies for teacher profession has been done. The online interface for the research and study program register is also ready, and the uploading with data by TE institutions is about to begin. The fourth R&D related to the appearance of the national curriculum crosscurricular areas finishes soon. The VET-related R&D is now under preparation.

In parallel with our initiatives the development processes of partner TE institutions are also progressing well, and interesting outcomes were obtained related to them. Many institutions developed actual contents. Program elements, learning materials, trainings have been developed, tested and shared through different conferences and workshops organized by the developer consortiums or by our institute.

The question of mentor teachers is a recurring issue in the projects of our partner TE institutions. The training for mentor teachers – which is a relative new TE supporting function in our public education – is required by law; however the legislation does not describe the nature of this new function in detail. Thus multiple initiatives emerged related to this topic within the TÁMOP 4.1.2B project. The experts at the University of West Hungary developed their own good practice, and they are ready to share it with other TE institutions. At the University of Pannonia a specific study program has been designed for mentor teachers as well.

Eötvös Loránd University has another interesting development related to the expanded, one year school practice. The concept they developed (*Czető et al*, 2015) presents the connection between the one year school practice at the end of the initial teacher training and the shorter practices take place earlier in TE programs. Their study highlights the problems of the current legal regulations, for example the lack of career socialization practices. They interpret the expanded practice as part of the continuous professional development of teachers. The practice in this concept is enriched with the focus on innovation, research and competence development which is consistent with the needs of the knowledge based society and the previously described learning outcome approach as well.

As we have seen the cooperation between the participating institutions was a mainly good experience for our partners. The participants gave positive feedback on our workshops, and they seemed to be excited about the new opportunities related to reconsidering their TE programs on a learning outcome based approach. Of course they identified different financial, organizational and time management difficulties related to it. For us it was a really interesting experience to work with these experts. As facilitators of the interinstitutional dialogue we learned a lot about the nature and functioning of teacher education and teacher educators. We are motivated to share our experiences on this special facilitator role as broad as possible.

References

- Adam, S. (2008): *Learning Outcomes Current Developments in Europe: Update on the Issues and Applications of Learning Outcomes Associated with the Bologna Process*, Bologna Seminar: Learning outcomes based higher education: the Scottish experience, 21 - 22 February 2008, Heriot-Watt University, Edinburgh, Scotland
- Allen, J. and van der Velden, R. (Eds. 2007): *The Flexible Professional in the Knowledge Society: General Results of the REFLEX Project*, Research Centre for Education and the Labour Market, Maastricht University
- Barber, M. and Mourshed, M. (2007): *How the world's best-performing schools come out on top* McKinsey&Company.
- Biggs, J. B. and Tang, C. (2007). *Teaching for quality learning at university*. Open University Press/Mc Graw-Hill Education.
- Delamare le Deist, F. and Winterton, J. (2005): What Is Competence? Human Resource Development International 8. 1. sz. 27-46. p.
- Drótos György (2009): *Integrált szakmai és gazdasági felelősség a felsőoktatási intézményekben – Az oktatási programigazgatói modell* In: Drótos György – Kovács Gergely (szerk.): Felsőoktatás-menedzsment, AULA Kiadó, Budapest, 109-133.
- Fazekas Ágnes and Halász Gábor (2012): *Az implementáció világa. Az európai uniós forrásokból megvalósított magyarországi oktatásfejlesztési beavatkozások empirikus vizsgálatának elméleti megalapozása*. ELTE PPK, Felsőoktatás-menedzsment Intézeti Központ, Manuscript (<http://www.impala.elte.hu/produktumok-i-munkafazis/>)
- Czető K., Orsolya K., Kopp E., Mészáros Gy., Rapos N., Tókos K., Seresné Busi E. (2015): *Javaslat az osztatlan tanárképzés gyakorlati rendszerének átgondolására és a jelenlegi gyakorlatok alapelveinek és funkcióinak meghatározására*, Manuscript (<http://www.ppk.elte.hu/wp-content/uploads/2015/04/Javaslat-az-osztatlan-tan%C3%A1rk%C3%A9pz%C3%A9s-gyakorlati-rendszer%C3%A9nek-%C3%A1tgondol%C3%A1s%C3%A1ra-%C3%A9s-a-jelenlegi-gyakorlatok-alapelveinek-%C3%A9s-funkci%C3%B3inak-meghat%C3%A1roz%C3%A1s%C3%A1ra.pdf>)
- Kennedy, D. (2007): *Writing and Using Learning Outcomes, A Practical Guide*, University College Cork (UCC)
- Pukánszky, B. (2012) *Paradigmák, viták és szervezeti legitimáció – A tanárképző központ történeti előzményei*. In: Sokszínű pedagógiai kultúra. Selye János Egyetem, Tanárképző Kar, Komarno, 132-143.
- Sabatier, P. (2005) *From Policy Implementation to Policy Change: A Personal Odyssey* In: Gornitzka, A., Kogan M. and Amaral A. (eds.): *Reform and Change in Higher Education, Analysing Policy Implementation* 17–35. p.
- Santiago, P., Tremblay, K., Basri, E., Arnal, E. (2008): *Tertiary Education for the Knowledge Society*, OECD Thematic Review of Tertiary Education: Synthesis Report, Volume 1 of 3, OECD

EFFECTS OF REAL-WORD VERSUS PSEUDO-WORD PHONICS INSTRUCTION ON THE READING AND SPELLING ACHIEVEMENT IN FIRST GRADERS

Jihan H. Khalifeh Mohamad & Ahmad Oweini

Lebanese American University, Department of Education (Lebanon)

Abstract

Use of pseudowords, such as ‘tam’ and ‘dib’, is a common method to test phonics acquisition, but rarely for instructional purposes. Hence, little is known about its effectiveness as a teaching tool.

This study compares two methods of phonics instruction: real words (the traditional approach) versus pseudo-words, on Lebanese first graders to determine the approach that will yield better reading and spelling achievements. To that end, two mixed level groups of three students each were selected. Before starting the intervention, students’ achievement in reading and spelling both real words and pseudo-words was tested (pretests) using four subtests of the Woodcock Johnson III Tests of Achievement which are: Letter-Word Identification, Word Attack, Spelling, and Spelling of Sounds tests. Posttests were administered at the end of the intervention period. Students’ performance was tracked throughout the study using CBM probes. The intervention consisted of a total of 20 sessions (30 minutes each) of phonics instruction based on the Recipe for Reading program. Both groups received the same intervention and followed the same lesson plan. The only difference was in the type of word lists provided for every group during the lesson. One group was exposed to real words only and the other group to pseudowords only. Results showed that the phonics instruction based on real words was more effective in improving decoding of real words, spelling of real words, and spelling of pseudo-words. The effectiveness of the real word method was very significant especially with at-risk students. On the other hand, the pseudo-word instruction showed slight improvement with average students in reading real words and pseudo-words, and spelling pseudo-words. This study has important implications for reading instruction to both regular and at-risk students.

Keywords: *decoding, pseudo words, spelling, first graders, Lebanon*

1. Introduction

Teaching children how to read and spell is considered a major role of educators. Well-designed and implemented reading and spelling instruction yields several benefits that students will reap throughout their schooling years, typically using a synthetic or analytic phonics approach (Moats, 2000a), which relies mostly on real words.

Recently, in the reading specialists such as Steve Dykstra, Bill Keeney, Ellen Engstrom, and others have hypothesized that teaching phonics using pseudo-words (nonsense words) may be more beneficial than using real words (SpellTalk Discussion Group, 2013). Pseudo-words are used mostly in tests that assess students’ reading and spelling achievement and are rarely considered as teaching tools.

1.1. Purpose of the Study

The aim of this study is to explore the better approach to teach reading and spelling, real-word vs. pseudowords, and make recommendations to reading instructors both in the mainstream and special education.

1.2. Research Question

Which phonics instruction method would result in more significant gains with first grade readers and spellers: real words or pseudo-words?

1.3. Hypothesis

The hypothesis of this study is that the phonics approach that is based on pseudo-words will lead to better results on both real word and pseudo-word reading and spelling tests, based on the assumption that students exposed to this approach strengthen their memory of phonics more than their memory of sight words when reading or spelling.

1.4. Significance of the Study

The utility of real words versus pseudo-words as screening and assessment tools has been extensively investigated (Byrne & Fielding-Barnsley, 1993; Pullen, Lane, Lloyd, Nowak, & Ryals, 2005). Although an earlier study claimed that students skilled at decoding pseudo-words become independent and competent readers (Byrne et al., 1993), only one study has explored the use of pseudo-word as an instruction tool. Results revealed that pseudo-word phonics instruction during one month improved students' decoding skills faster than the real word phonics instruction (Cardenas, 2009). This study makes a unique contribution to the field of reading remediation in the hope of guiding teachers to the most effective strategies to maximize their students' reading achievement.

2. Phonics Instruction

The phonics approach follows an explicit method to teaching reading and spelling skills. It teaches students phonemes, graphemes, letter-sound correspondence, spelling patterns, and blending letters into words. As a result, better decoding skills can be achieved when systematic phonics instruction is applied (Stahl, Duffy-Hester, & Dougherty Stahl, 1998). As for spelling, it was found that systematic phonics is helpful for young students, who are at grade one or below, and not older ones (Ehri, Nunes, Stahl, & Willows, 2001; NRP, 2000b).

3. Methodology

3.1. Research Design

The study is quantitative in nature and uses the quasi-experimental design. Intervention was applied to two groups: the control group which received real word phonics intervention, and the experimental group which received pseudo-word phonics intervention. The independent variable for this study is the type of phonics instruction (real word versus pseudo-word) and the dependent variable is the students' reading and spelling achievement.

3.2. Setting

The study was conducted in a middle-class private school located in the suburbs of Beirut, and uses Arabic and English as languages of instruction. The intervention sessions took place in a classroom equipped with computers.

3.3. Sampling and Participants

A purposive-convenient non-random sampling technique was adopted for this study. Participants included first graders whose reading and spelling achievements range from average to at-risk. Six first graders were selected from different sections forming 2 triads consisting of one boy and two girls. The real word group is referred to as Real1, Real2, and Real3, whereas the pseudo-word group as Pseudo1, Pseudo2, and Pseudo3.

To select the participants, the English teacher was contacted and asked to suggest the names of some students who are performing below their grade level in reading and spelling. Their present level of functioning in reading and spelling was formally assessed.

3.4. Teaching Material

The Recipe for Reading (Bloom & Traub, 2005) was used. It relies on the synthetic approach, provides multisensory, explicit cumulative instruction, and phonetically controlled sentences, with built-in evaluation modules.

3.5. Instruments

For the pre and post assessment, the following was used: The Woodcock Johnson III tests of Achievement (Letter-Word Identification, Word Attack, Spelling, and Spelling of Sounds), and Curriculum Based Measurement to monitor students' progress during intervention using the following basic skills: Word Identification Fluency (WIF), Nonsense Word Fluency (NWF), and Correct Letter

Sequences (CLS) for both real words and pseudo-words) (Hosp et al., 2007). Pre-tests and posts were administered end of April and at the middle of May respectively. Students' chronological ages ranged between 6-4 and 6-9.

3.6. Procedure

After the students' achievement level in reading and spelling of both real words and pseudo-words was established, baseline was obtained for CBM baseline data for every student in each area (reading real words, reading pseudo-words, spelling real words, and spelling pseudo-words). The word lists provided in the testing probes were selected from the phonics textbook used in class. The words were picked from the phonics lessons that were covered in class and that included short and long vowels, blends, and digraphs. After intervention sessions were initiated, CBM measures for the four areas were taken for every student at the end of the fifth, tenth, fifteenth, and twentieth session. The probes used included word lists that were limited to the lessons covered during the intervention until the date of the examination. The results were then plotted on the CBM chart. At the end, the same WJ-III subtests were administered for all the students to measure their improvement.

3.7. Intervention

This study was conducted over a period of two weeks during the third term of the 2013-2014 scholastic year. Every group received 20 intervention sessions of 30 minutes each. Students were pulled out during their English sessions. The same procedure and intervention were applied with both groups. The only difference was in the content of the word lists provided in every lesson of the *Recipe for Reading* program. For example, the short /u/ sound was illustrated with read real words like *cup* and *jump*, whereas for the pseudo-word group, letters examples were replaced with non-real words like *lup* and *kump*. Intervention for both groups was provided by one of the researchers (Khalifeh).

During these twenty sessions, students in both groups were introduced to 20 letters/sounds (one letter/sound per session). The order of presenting these letters and sounds followed the same sequence adopted by the *Recipe for Reading*. The letters taught are: c, o, a, d, g, m, l, h, t, i, j, k, p, ch, u, b, r, f, n, and e. The vowel lessons taught during the intervention included short sounds only.

At the end of every lesson, students completed some activities designed by the researchers to reinforce the concepts at hand. A review of the previous lessons was done at the beginning of every session.

4. Results and Discussion

The results of the Woodcock Johnson III subtests and CBM tests revealed that the phonics approach, regardless of the type of words used, helped students develop their decoding and encoding skills. The post-test results of the four WJ-III subtests showed that students of both groups have made good improvement in reading and spelling real words and pseudo-words as compared to pre-tests. This improvement was in many cases statistically significant. The CBM results also support this finding. All the students showed improvement, especially in spelling, and were able to outreach the performance goal. As for reading, while all students improved, not all were able to reach the desired performance goal.

The results also reveal that the pseudo-word approach was more effective for at-risk than for average students. At-risk students were able to make significant improvements ($\geq +1SD$) in the post-tests. When the intervention was initiated, most of the students were at the lower limit of the partial alphabetic level of reading and spelling development. Their knowledge of the alphabetic system was not complete, and they were incapable of decoding unfamiliar words. This can be reflected by the students' baseline scores on the Nonsense Word Fluency CBM measurement (R1=0, R2=0, R3=3, P1=1, P2=0, and P3=1). Most students were also unable to read new words by analogy to familiar words because their lexicon of sight words was limited. This can be reflected by the students' initial base line scores of the Word identification Fluency CBM measurement. During the NWF test, students were asked to read presumably familiar words selected from their phonics textbooks. Half of the students scored zero in this test. As for spelling, given students' incomplete knowledge of the alphabetic system, students used invented spelling by relying on the most salient letters in the word.

To measure the effectiveness of real word versus pseudo-word instruction, comparisons between the two groups as a whole then among students matched by level of performance are proposed.

For the former, the WJ-III results revealed that the real word group outperformed the pseudo-word group in reading real words, spelling real words, and spelling pseudo-words. The greater difference in improvement was in favor of the real word group in the Letter-Word Identification test despite the initial advantage of the pseudo-word group who scored higher in the pre-test. The results of the Letter-Word Identification test and Spelling test can be explained in terms of the reading and spelling

strategy that the students used which is decoding and encoding by sight, relying mostly on rote memory. Students in the real word group were exposed to meaningful words repeated several times during the intervention sessions. When students look at words and read them, their alphabetic system knowledge is stimulated, and in turn, they form a connection between the word's grapheme and phoneme. Reading a word several times creates an amalgam that combines a specific decoding pattern, encoding and meaning and stores it in long-term memory (Ehri, 2000).

The pseudo-word group also read pseudo-words several times, yet their performance was not up to par. A possible explanation is that pseudo-words have no meaning so the amalgam that should have been created was not complete, consequently their retrieval was faulty.

The results of the Spelling of Sounds test which taps written phonics showed that the real word group made better improvement than the pseudo-word group even though their instruction was based on real words. This was echoed by the results of the pseudo-word Correct Letter Sequence where the real word group outperformed the pseudo-word group. This pattern is consistent with the research claims that spelling is more demanding than reading. Pseudo-word group members were not able to transfer their knowledge of pseudo-word reading rules to pseudo-word spelling. As for the real word group, their higher scores on the Spelling of Sounds test may indicate that they had depended on the *analogy strategy* to spell the pseudo words. Their emergent lexicon of sight words had allowed them to derive phonics rules for encoding.

When comparing the results of students matched by performance between the two groups, we find that the at-risk student in the real word group outperformed his peer in the pseudo-word group in all skills except Word Attack. The difference in improvement is recognizable. This implies that the pseudo-word instruction is not effective with struggling readers and spellers who are at the lower limit of the partial alphabetic level of reading and spelling development where the learner needs to build a repertoire of words in their lexicon so that they can refer to when reading or spelling new words (Ehri, 2005). Since pseudo-words are meaningless, their encoding in long-term memory seems inadequate relative to that of real words. However, if we compare the results of average students across groups, we find that the pseudo-word group made better improvement in all areas except spelling. The difference of the level of improvement between both students in the average group was minimal (maximum 2 SS) compared to that of the below average students (maximum 11 SS). The average students have developed a good knowledge of the alphabetic system and letter-sound correspondence and already have a good repertoire of words to refer to. This repertoire of words helps average students read or spell analogous words. However, if they encountered unfamiliar words which do not have a specific match in their lexicon, they fail at the task (Ehri, 2000; 2005).

In sum, phonics instruction based on real words was more effective in reading real words, spelling real words, and spelling pseudo-words. The effectiveness of the real word method was more evident with at-risk students. On the other hand, the pseudo-word instruction was slightly more effective with average students in reading real words and pseudo-words, and spelling pseudo-words. Thus, the hypothesis of this study was validated only for average students, but not for struggling readers and spellers.

Hence, based on the findings, teachers are urged to avoid using pseudo-words in their phonics instruction for at-risk students, and focus instead on real words, while continuing to use nonwords in progress monitoring and other assessment activities. For other students, including pseudo-words occasionally in their reading and spelling instruction can help reinforce decoding and encoding skills, and strengthen their knowledge of phonics rules.

References

- Bloom, F., & Traub, N. (2005). *Recipe for reading*. Cambridge, MA: Educators Publishing Service.
- Byrne, B., & Fielding-Barnsley, R. (1993). Evaluation of a program to teach phonemic awareness to young children: A 1-year follow-up. *Journal of Educational Psychology*, 85, 104-111.
- Cardenas, J. M. (2009). *Phonics instruction using pseudowords for success in phonetic decoding* (Doctoral dissertation). Retrieved from ProQuest Digital Dissertations. (ED513970)
- Dykstra, S. (2013, December 11). Nonsense words. Retrieved from <http://mailman.listserv.com/listmanager/listinfo/spelltalk>
- Ehri, L. C. (2005). Learning to read words: Theory, findings, and issues. *Scientific Studies of Reading*, 9(2), 167-188.
- Ehri, L. C. (2000). Learning to read and learning to spell: Two sides of a coin. *Topics in Language Disorders*, 20(3), 19-36.
- Hosp, M., Hosp, J., & Howell, K. (2007). *The abcs of CBM: A practical guide to curriculum-based measurement*. New York, NY: The Guilford Press.

LANGUAGE MAINTENANCE AND STUDENTS' IDENTITIES IN ENGLISH MINORITY LANGUAGE SCHOOLS IN QUÉBEC

Diane Gerin-Lajoie¹, Max Antony-Newman¹ & Pierre-Olivier Bonin²

¹OISE, University of Toronto (Canada)

²Department of Political Science, University of Toronto (Canada)

Abstract

For linguistic minorities around the world, the school plays an essential role in the maintenance of the minority language and culture and becomes, then, a linguistic “community”, where parents, students and members of the minority at large share common values. In addition, the educational institution has often for mission to contribute to the development, within students, of a strong sense of identity to the linguistic minority group. Indeed, expectations are often high in regards to the reproduction of the minority language and culture. The proposed paper looks at the preliminary results of an ongoing study that examines how students enrolled in these schools live their daily experiences in a context where the linguistic minority school population is increasingly diversified. More specifically, the paper examines the case of students from the official linguistic minorities in Canada, which consist of the Francophones outside of Quebec and the Anglophones in Quebec, who have the legal right to receive instruction in their minority language, focusing mainly on Anglophones in Quebec, where the school constitutes a vital institution for its students, especially for those living in areas of the province where Anglophones are in small minority. Students enrolled in English minority language schools in Québec develop a *rapport* to language which brings them inevitably to live at the border of two languages, and sometimes three languages in the case of ethnic minorities. In this context, how do they define their linguistic identity? How do these high school students perceive themselves? Do they consider themselves Anglophones, members of the Francophone majority group, individuals with a bilingual identity? How does the school contribute to these identity choices? Our discussion is based on an ongoing qualitative study of the life trajectories of 20 students enrolled in two English minority language high schools in rural Québec. The empirical study is based on a series of in-depth individual interviews with these students. Members of their family, their friends, as well as their teachers are also interviewed in the context of the 3-year study, allowing for a better understanding of the students lived experiences with language, culture and identity in the school setting. So far, results show that, in the students’ discourse, identity represents a complex entity. Furthermore, students live in two linguistic worlds, where the school plays an important role in one of them as an agent of linguistic (re)production.

Keywords: *Linguistic minorities, identity, diversity, life trajectories, minority education.*

1. Introduction

For linguistic minorities around the world, the school plays an essential role in the maintenance of the minority language and culture, and becomes, then, a linguistic “community”, where parents, students and members of the minority at large share common values. In addition, the educational institution often has a mission to contribute within students to the development of a strong sense of identity to the linguistic minority group. Indeed, expectations are often high in regards to the reproduction of the minority language and culture. The proposed paper looks at the preliminary results of an ongoing study that examines how students, enrolled in these schools, live their daily experiences in a context where the linguistic minority school population is increasingly diversified. More specifically, the paper examines the case of students from the official linguistic minorities in Canada, which consist of the Francophones outside of Quebec and the Anglophones in Quebec, who have the legal right to receive instruction in their minority language. It focuses mainly on Anglophones in Quebec, where the school constitutes a vital institution for its students, especially for those living in areas of the province where Anglophones are in small minority. Students enrolled in English minority language schools in Québec develop a *rapport* to language which brings them inevitably to live at the border of two, and sometimes three languages, in the case of ethnic minorities. How do they define their linguistic identity in this

context? How do these high school students perceive themselves? Do they consider themselves Anglophones, members of the Francophone majority group, individuals with a bilingual identity? How does the school contribute to these identity choices? Our discussion is based on an ongoing qualitative study of the life trajectories of 20 students enrolled in two English minority language high schools in rural Québec. The empirical study is based on a series of in-depth individual interviews with these students. Members of their family, their friends, as well as their teachers are also interviewed in the context of the 3-year study, allowing for a better understanding of the students' lived experiences with language, culture and identity in the school setting. So far results show that, in the students' discourse, identity represents a complex entity. Furthermore, students live in two linguistic worlds, where the school plays an important role in one of them functioning as an agent of linguistic (re)production.

2. The context

Anglophones in Québec represent one of the two official linguistic minorities in Canada. The other minority is the Francophones that are scattered across the Canadian provinces and territories. According to the 2011 Census, the Anglophone population of Québec is 1,058,250 (13.5% of the total population). This number is based on the first official language spoken data, which is derived successively from questions about knowledge of official languages, mother tongue and language spoken at home most often. The province has close to 400 public schools which have English as their language of instruction, and they are under the administration of nine English-speaking school boards. According to the 2011 Census data, about 80% of Anglophones in Québec live in the Montreal area (Statistics Canada 2011; Corbeil et al., 2010; Gérin-Lajoie, 2011). The situation outside of Montreal is very different; Anglophones represent a very small proportion of the general population in these regions. Services and resources in English are difficult to find; the number of exogamous couples (one Anglophone and one Francophone), is higher; and linguistic transfers from English to French are more frequent. This is the context in which the participants in our study live.

Since the enactment of the Charter of the French Language in 1977 (better known as Bill 101), the Québec English minority language school system has gone through significant changes. The English minority language schools in Québec are not open to everyone anymore. According to the Québec Ministry of Education, Sports and Leisure (2010), referring to the Québec Charter of the French Language, children in the following three categories may be enrolled in English minority language schools: 1) children who are permanent residents of Québec and who qualify for a certificate of eligibility for instruction in English; 2) children who are permanent residents of Québec and who are entitled to receive instruction in English under a special authorization; 3) children who are living in Québec temporarily and who qualify for a temporary authorization to receive instruction in English. The certificate of eligibility referred to in the Ministry's statement is generally delivered to children who (a) received most of their elementary or secondary instruction in English in Canada; (b) or whose brother or sister received most of his or her elementary instruction in English in Canada; (c) or whose father or mother received most of his or her elementary instruction in English in Canada; (d) or whose father or mother attended school in Quebec after August 26, 1977, and could have been declared eligible for instruction in English on that date. In the first two cases, the child's father or mother must be a Canadian citizen. In the third case, the child's father or mother must be a Canadian citizen unless he or she was educated in Quebec. The MELS (2010) goes on to state that the certificate of eligibility for instruction in English is permanent. When a child is declared eligible for instruction in English, his or her brothers and sisters may also be declared eligible.

Declining student enrolment, school closures, and a more diverse student population (immigrant as well as Francophone) are some of the problems, to name but a few. For example, the number of students has decreased significantly overtime and according to the Québec Ministry of Education, Sports and Leisure and the Ministry of Higher Learning, Research and Technology (2011), there were 110,154 students enrolled in English minority language schools in the province of Québec in the school year 2009-2010, compared to 272,000 in 1971-1972. On December 3, 2013 the Québec English School Board Association reported on its website that the total number of students was now 105,000.

The Government of Québec's 1992 Task Force on English-Language Education in Quebec—or the Chambers Report named after the chairwoman of the task force on English minority language education—painted an alarming portrait of English minority language education in Quebec. This report, and the task force that produced it, have played a key role in English minority education in Quebec. The report insisted on the importance of the schools contributing to the vitality of the Anglophone community, especially in regions of Québec other than Montréal. However, no other government document refers to this fact, which is an intriguing finding. Contrary to the French minority language schools outside Quebec, in particular those in Ontario, which have an explicit, official mandate to safeguard the French

language and culture, the Quebec government has not conferred this mandate on Quebec's English minority language schools (Gérin-Lajoie, 2003). In practical terms though, the English minority language schools located outside of Montréal do act as safeguards of the English minority language in those communities.

3. The study

The objective of the study (2013-2016) is to examine closely, from a sociological lens, the process of identity construction in our participants. The conceptual framework is based on a sociological understanding of the notion of identity, where it is perceived as a dynamic process, never fixed in time, as well as a very complex one (Gérin-Lajoie, 2011; Hall, 2006; Woodward, 2002). The study is designed using a postmodern understanding of the notion of identity, where this concept is not understood as essentialist, but is rather viewed as an evolving phenomenon. Starting from the point of view that identity is not automatically inscribed at birth, but rather is the result of a social construction, the objectives of the study are: 1) to better understand how adolescents in English speaking schools in Quebec outside of the Montreal area make sense of their identity, and how they define themselves as individuals belonging to a particular linguistic group; 2) to analyze the paths that lead them to these choices; and 3) to compare the discourse of the Anglophone youth living outside of Montreal with the one held by the adolescents from the Montreal area, as well as the discourse of Francophone youth in Ontario. The comparison will be based on results from two previous programs of research funded by SSHRC (Gérin-Lajoie, 2003, 2011), as well as on existing studies on Anglophones (Pilote, Magnan and Groff, 2011), and on Francophones outside of Québec (Gérin-Pilote, 2006; Dallaire, 2003; Breton, 1994). In the context of this paper, only the first objective, that of how the youth perceived their own identity, will be discussed in order to more clearly understand its significance for this particular group of young people. The notion of multilingual identities (mostly bilingual, as will be seen in the presentation of the results) is at the core of our analysis.

The study is mostly qualitative. It uses in-depth interviews with a small group of selected youth (a total of 20 participants, as well as semi-structured interviews with the members of their family, their friends and their teachers. We are in the second year of the ongoing study. During the last year group discussions with the selected youth will be performed in each school. First, a brief survey questionnaire on the youth's linguistic practices was administered in order to: 1) gather demographic and linguistic information from adolescents enrolled in two Anglophone schools located in two Anglophone school boards in Quebec, outside of Montreal; and, most importantly, 2) select 20 participants for the qualitative component of the study, which consists of conducting several in-depth interviews and semi-structured interviews with the selected participants, members of their family, friends and teachers. In Year 1 of the study the first slice of the youth's life trajectory was about their childhood within their family and their life in school. In Year 2 of the study we have discussed the youth's sense of identity and belonging as well as friendships. Semi-structured group interviews took place with the members of their family to discuss language practices within the family, the notion of identity, language and culture. Individual semi-structured interviews were also conducted with their teachers. Next year, we plan to meet the participants with their friends and discuss linguistic practices, identity and sense of belonging. Finally, we intend to have group discussions in each school with the respective students to reflect on the research process and their experience as participants.

Participants are students aged 14 or 15 enrolled in Secondary 3 (Grade 9) in two English minority language schools located in two different school boards outside of the Montreal area. The first one is located north of Montreal and the second one in central Québec. Those schools are small with less than 500 students in each. The 20 participants for the life trajectories component were selected based on the following criteria: at least 10 students coming from families where at least one of the parents has English as mother tongue; a selection of families from the province of Quebec, from Canada and from outside of Canada; with at least one sibling; an equal number of male and female students.

4. A few results

The majority of our 20 participants have told us that they have a bilingual linguistic identity. Most of them live in an Anglophone environment at school and in French at home. A small number use a third language at home. As a result, students from the two schools live in two worlds (sometimes three) at once and cross linguistic borders regularly. For a majority of our participants, to declare a bilingual linguistic identity means that they are going to an English minority language school, as expressed by a few of them:

“I would say that I am mostly Francophone. Because I speak a lot of French with everyone. And English, like, I speak English some, like, let's say, to talk to you, with my teachers. But outside of that we usually talk a lot in French” (John, Central Québec School).

“I'm bilingual, yes I love English, but sometimes I'll be more inclined to being Francophone. I'm really Quebecoise. I love Canada and I love the English language but Quebec is my home” (Clara, North of Montréal School).

Others, who claim an Anglophone linguistic identity, base it mostly on the type of activities they pursue:

“I think I am more Anglophone, because usually, I like speaking French, because it's my first language and everything, but I like other things in English like movies, like American movies are better in English, American shows are better than, like, French shows and like the expressions in English are better to make than expressions in French” (Mark, Central Québec School).

In this quote, Mark acknowledges his French mother tongue, but declares being more comfortable in English. Claiming a specific form of linguistic identity remains an individual choice and does not mean the same thing for everyone. For example, in the present study the results show that in their process of identity construction each participant is influenced differently and, as a result, position themselves differently. Their discourse shows the complexity of their *rapport to* language and identity. This complexity was already noticed in previous studies. Linguistic minority groups, like other minorities, are not homogeneous groupings. Factors such as race, gender, social class and geographical space shape a community. For those reasons individuals do not always feel that they belong to a single group (Lamarre, 2007). Anglophones who live outside of Montreal might have more in common with Francophones outside of Québec than with Anglophones from Montreal (Gérin-Lajoie, 2011, 2014). Access to English resources and services is more of a challenge outside of Montreal.

As stated previously, outside of the school (and the home for some participants), linguistic practices take place in French. In the public sphere these students have few opportunities to use the English minority language. The role of the school in the maintenance of the English minority language is then viewed as essential in this social context. As explained by Breton (1968), for linguistic minority groups the role played by the school in social, linguistic and cultural reproduction, and the potential influence of the school on the identity construction of students become important considerations. This is especially true in the absence of institutional completeness, i.e. when the school is the only institution, or one of very few institutions available to the minority group, like in the case of the school population of the present study.

Our participants see their schools as safe places, where teachers care about them and where their friends are mostly found. Some of the participants have been with the same students since their first day in school as they have always been in the English minority language school system. Our participants describe their schools in the following ways:

“the teachers are awesome. All of the secondary teachers are awesome.” (Carl)

“I feel that is funny, because in other schools there is a lot more people in elementary and secondary and they change every class, almost every year they change class, so me I like it better, 'cause I know my friends and I like ... There is a group of friends”. (Thierry)

“Well, here, there is no bullying, like, everybody gets along. The teachers are nice. Sometimes there are students that aren't very good. So, teachers are like more tough with them, sort of. But, in general they are nice. So, almost every student doesn't like to fool around. So, it always goes well in class”. (Luis)

“Well, the school is pretty much like, pretty much a big family, because it's such a small school. So, I know pretty much everybody's name in the school”. (David)

“I like the school, 'cause it's small, so you, like, everybody knows each other and... like, there's... not ... much bullying, I haven't, like, a little bit, but, I mean, I try to watch out for those persons and like, help them there, but, they don't get bullied that much”. (Melanie)

This feeling of being part of a family is not specific to these participants. The same sense of security and being friends with the students have been documented in previous studies (Gérin-Lajoie, 2011, 2003). The fact that teachers have known the students since day one contributes to this feeling of being a whole individual and not a number, as it is often the case in large linguistic majority school settings. For the youth, their school is important in their lives, not so much because they learn in the minority language, but because they like the social environment of learning.

5. Concluding remarks

The late sociologist Roger Bernard (1998) talked about the specific notion of bilingual identity in the Francophone communities outside of Quebec in those terms:

“The scope of the phenomenon demonstrates that a dual linguistic status is taking shape—one that is no longer a marginal reality. This dual linguistic status is a characteristic of Ontario’s Francophone community. This is not community dualism; it is a new form of individual bilingualism and biculturalism that is developing within Canada’s Francophone community”. (Translated from French) (p. 82)

Today the reality described by Bernard applies beyond Francophones living outside of Quebec. Our emerging analysis demonstrates that different forms of linguistic identity are also very much alive in the discourse of our Quebec’s English minority language participants. In their discourse on identity, language is prevalent and there is a focus on ability to communicate in one or more languages. However, in discussing language issues, they also reflect on identity and a sense of belonging, especially when they discuss their school life. Language remains central to an individual’s identity. It influences the ways in which one develops a *rapport to* identity.

Clearly the lines between languages are increasingly difficult to draw in linguistic minority settings, and it is impossible, of course, to ignore the influence of the linguistic majority on the minority group. This influence often puts pressure on the minority group in its efforts to keep its language and culture alive. This is certainly the case for Francophones living outside of Quebec, for whom the English language and culture are omnipresent (Gérin-Lajoie, 2003). This is also true for members of the Anglophone minority living outside of the Montreal area. French majority language and culture have a significant impact on their lives, which manifests itself in different ways, when we compare this situation to the situation of other linguistic minorities in the world. English is still the language of globalization after all. Through the emerging life trajectories of our participants it is a fact that linguistic and cultural border-crossing is commonplace.

As for the role of the school in these minority settings, it is obvious that they are instrumental in keeping the English minority language alive, even though these communities have gone through significant changes since the middle of the 1960s, especially with the enactment of Bill 101 in 1977.

References

- Bernard, R. (1998). *Le Canada français: Entre mythe et utopie*. Ottawa: Éditions Le Nordir.
- Breton, R. (1994). Modalités d'appartenance aux francophonies minoritaires: Essai de typologie. *Sociologie et sociétés*, 26(1), 59–69.
- Breton, R. (1968). Institutional completeness of ethnic communities and the personal relations of immigrants. In B.R. Blishen (Ed.), *Canadian society: Sociological perspectives*, (pp.77-94). Toronto: MacMillan du Canada.
- Corbeil, J. P., Chavez, B., & Pereira, D. (2010). *Portrait of Official-Language Minorities in Canada – Anglophones in Quebec*. Ottawa: Statistics Canada.
- Dallaire, C. (2003). Not just Francophone: The hybridity of minority Francophone youths in Canada. *International Journal of Canadian Studies*, 28, 163–199.
- Gérin-Lajoie, D. (2014). Identité et sentiment d'appartenance chez les jeunes anglophones de Montréal. *Recherches sociographiques*, LV, 3, pp. 467-484.
- Gérin-Lajoie, D. (2011). *Youth, language and identity: Portraits of students from English-language high schools in the Montreal area*. Toronto: Canadian Scholars’ Press.
- Gérin-Lajoie, D. (2003). *Parcours identitaires de jeunes francophones en milieu minoritaire*. Sudbury: Les Éditions Prise de parole.
- Hall, S. (2006). The future of identity. In S.P. Hier & B. S. Bolaria (Eds.), *Identity and belonging: Rethinking race and ethnicity in Canadian society* (pp. 249-269). Toronto: Canadian Scholars’ Press.
- Lamarre, P. (2007). Anglo-Quebec today: Looking at community and schooling issues. *International Journal of the Sociology of Languages*, 185, 109-132.
- Pilote, A., Magnan, M.O., & Groff, C. (2011). Education and linguistic boundaries in Quebec: Student representations and pedagogical reflections from a critical perspective. *Bellaterra Journal of Teaching & Learning Language & Literature*, 4(3), 1-23.
- Québec Ministry of Education, Sports and Leisure (2014). *Instruction in English in Quebec*. Retrieved June 14, 2014, from: www.mels.gouv.qc.ca/daasa/rens/banque/Fiches/F95a.htm
- Québec Ministry of Education, Sports and Leisure and the Ministry of Higher Learning, Research and Technology (2011). *Statistiques de l'éducation : Enseignement primaire, secondaire, collégial et universitaire*. Québec City: Government of Québec.
- Statistics Canada (2011). *Geographical Perspective, 2011 Census – Province of Quebec*. Ottawa: Government of Canada.
- Woodward, K. (2002). *Understanding Identity*. Great Britain: Hodder Education. *Linguistic minorities, identity, diversity, life trajectories, minority education*

THE DEVELOPMENT OF THE PERSONAL AND PROFESSIONAL VALUES FRAMEWORK AS AN AID TO ETHICAL DECISION-MAKING

Hua Hui Tseng

Music Department, Tainan University of Technology (Taiwan)

Abstract

Ethical analysis frameworks can help to identify the ethical dimensions to academic discipline and provide a method for justifying ethical decisions. Published frameworks, however, have some limitations to easy, practical use. The purpose of this paper is to use the five sources of ethical standards identified by the Markkula Center for Applied Ethics (2006) to describe and explore consequentialist and deontologist forms of ethical reasoning for deciding matters of morality in education. A literature search identified published frameworks that define the components of ethical decision-making. On this basis, a new framework, the 'Personal and Professional -Values integrated' was constructed. Consideration will be given to areas and practices in the guidelines or rules for the process of forming ethical reasons and variations that are less easily accommodated by these ethical frameworks. The ideas of Will as described by Chinese philosopher Mencius (371-289 BC) are used to gain insight into some of the implications of ethical decisions. It is demonstrated that leadership rules in education are realized by acknowledging the reasons for an action, and ethical decision making is defined as conforming to the criteria pertaining to these considerations as well as the professional conduct expected.

Keywords: *Ethical decision making, behavior, values*

1. Introduction

Within education ethics, the analysis of the ethical decision-making process has gained importance because a better understanding of this process may more accurately identify factors that facilitate ethical behavior (Ametrano, 2014). Research about the process by which individuals behave unethically has provided inconclusive results (Marquardt, 2010; Marquardt & Hoeger, 2009; O'Fallon & Butterfield, 2005; Watson, Berkley, & Papamarcos, 2009). It has been argued that no existing framework is robust enough to explain the complexity of the human ethical decision-making process (Craft, 2013; O'Fallon & Butterfield, 2005). Teaching ethics might involve providing students with exposure to multiple ethics theories that can provide a framework for decision-making in order to ensure "increased awareness of ethical issues and enhanced decision-making skills" (Dzurinin, Shortridge, & Smith, 2013, p. 102).

Ametrano (2014) described becoming an ethical professional as a developmental process (Neukrug, Lovell, & Parker, 1996) that involves movement from memorizing standards toward learning to integrate professional ethics with personal values (Handelsman, Gottlieb, & Knapp, 2005). The ethical norms/incentives factor had a highly significant effect on measures of behavioral intent. Specifically, an organizational culture that emphasizes and rewards ethical behavior, and in which organizational leaders serve as positive role models, reduces the likelihood that tax practitioners will engage in overly aggressive actions.

K. D. Walker and Donlevy (2009) argued that personal conscience, relational reciprocity, common ethical principles, and professional convictions with constraints form a multi-frame analysis. They provided the facts and decisions of a Canadian legal case to demonstrate how such an ethical analysis is best suited for the attainment of personal and professional integrity amongst educational decision-makers. Joy (2007) stated that causes of wrongful convictions should be addressed rather than hoping and waiting for the existence of systemic change in legislation. Legal self-help remedies are outlined to prevent wrongful convictions. Smith (2010) noted that while there is a feeling of gratification for a conviction, representing the best ideas in making political decisions, there are dangers in assuming the rightness of one's conviction at all costs and being blind to any evidence to the contrary of that conviction. It mentions on U.S. President Woodrow Wilson's fourteen points the insisted Europe follow

the end of World War I. Beckner (2004) noted that students need good leaders in education, professionals who show, through example, that they follow a system of personal and professional ethics consistent with the best social and personal convictions. Educational leaders are often faced with ethical dilemmas in the course of their daily work; they are required to make complex decisions in the best interests of their students and schools.

Bennis and Thomas (2002, as cited in Huppert, 2003) pointed out that the ability to overcome adversity and learn from passion in both work and life has been linked to leadership ability in managers in various fields. The decision makers' thinking processes included vision, political astuteness, being tactical, being strategic, due diligence, and risk management; the ethical processes included respect for diverse opinions, integrity and trust, democracy, impact of policies, passion for public service, and intuition about doing the right thing (Jiwani, 2011).

Chinese philosopher Mencius (371-289 BC) drew attention to the innate goodness of human nature; the chief constituent of human nature is the Will, the outer acting nature through which appetites arise, develop, and are fulfilled. According to Rowe (2012), Socrates acknowledged the role of 'appetites and passions' as affecting human behavior (p. 310). Reshotko (2006) noted that appetites are like sense impressions: they are phenomena that help people form judgments, but they do not interact with judgments that have already been formed. Mencius suggested that ethical behavior maintained a firm Will without doing violence to the passionate nature of individuals (Legge, 2013). What Mencius pointed out is important for understanding ethical behavior in education. According to Rowe (2012), Brickhouse and Smith in 2010 noted that Socrates holds that "passions such as pride, humiliation and anger [and also 'nonrational desires' like hunger, thirst, or sexual passion] explain nothing about how human beings behave except perhaps as sources of information" (p. 310) used by reason in order to determine its view of what is best.

In this study, an integrated ethical decision-making model, which was reviewed by Crossan, Mazutis, and Seijts (2013) will be used. The model includes the steps decision makers must consider with respect to personal values and/or their beliefs about the ethical principles of autonomy, awareness, beneficence, justice, and judgment. Ethical decision-making is a process constituted by all the stages an individual has to go through from the moment a moral problem arises until he or she engages in a given behavior. In this study, the task of ethical reasoning (or of the norms or moral evaluation) and the basic problem of the level of reflection typically labeled as "normative" are reviewed. The study illustrates different attitudes with which to seek to clarify "the why" of moral phenomenon, following a classification based on the distinction between empiricism (related to consequentialism) and a priorism (at some point linked with deontology). Knowing how to make ethical decisions that are aligned with legal parameters and specific school policies might enhance understanding of the meaning of educational ethics, and using ethical decision-making models to understand educational ethics might offer insight into how to make ethically sound decisions in the educational context.

2. Ethical Decision Making

In the education field, it is important that each individual feel personally and ethically responsible. The development of ethical decision making prevents the attribution of blame to someone else or some other department for one's own ethical transgressions, thus encouraging one to take responsibility of one's decision. Making decisions that are ethical requires the ability to make distinctions among competing choices. Ethics elucidates how a conscientious person should behave by providing a way to choose among those competing options.

3. Ethical Decision Model

The Markkula Center for Applied Ethics (2006) offers one suggested model for assessing the ethical nature of a decision. Ethical decision-making should apply at least five different understandings of ethical standards. These five understandings of are the utilitarian approach, which deals with consequences; the rights approach, which implies particular duties to be fulfilled; the fairness or justice approach, in which equals should be treated equally; the common good approach, with interlocking relationships in society as the basis of ethical reasoning; and the virtue approach, which implies acting according to the highest potential of one's character and on behalf of values like truth and beauty.

4. Consequentialism

The word “consequentialism” identifies a general approach to moral reasoning within which there are several somewhat similar moral theories, each with variations (Keith, 2005). Grayson (2007) claimed consequentialism is about the moral rightness of acts and the embodiment of the idea that the “ends justify the means” (p. 2-2). The only attribute that determines the morality of an action is its results or consequences. Consequentialism holds that whether an act is morally right or not depends only on the consequences of that act or of something related to that act, such as the motive behind the act or a general rule pertaining to acts of the same kind. Consequentialism has its roots in the work of John Stuart Mill (1806-1873); Mill espoused the idea of utilitarianism. The permissibility of actions is determined by examining the situation’s outcomes and comparing those outcomes with what would have happened if some other action had been performed.

Consequentialism holds to the utilitarian approach; it deals with consequences: “Actions, including institutions, laws and practices are to be justified only by their references to consequences” (Smart & Williams, 1997, p.79). In the Encyclopedia Britannica (2006), however, it is pointed out that consequentialists also differ over whether each individual action should be judged on the basis of its consequences or whether general rules of conduct should be judged in this way and individual actions judged only by whether they accord with a general rule. The former group hold to “act-utilitarianism” and the latter “rule-utilitarianism.”

4.1. The rules for consequentialism

Happiness is good in the eyes of consequentialists. For example, Jeremy Bentham’s (1748-1832) act-utilitarianism considered the quantity of pleasure, and Mill’s rule-utilitarianism considered the quality as well as quantity of pleasure. If the act is right, it creates good consequences that are good for everyone affected. Good consequences must be impartial, in so much as oneself or family members should not count more (or less) than anyone else.

4.2. Problems with consequentialism

One problem with consequentialism, as a theory of the right, for the moral status of an action, is it is neutral with respect to a theory of the good or the value of a state of affairs or outcome. Humans do not all share common goals, so what is good for one may not be the good for another. Another problem pertains to doing versus allowing an action to happen, and a third is the double effect mentioned by Gary Watson (2004), who distinguishes what he calls the two faces of responsibility. The first, which he calls the aretaic or the attributability aspect of responsibility, is intimately linked to a self-disclosure view of moral responsibility. Someone is responsible, in this sense, if his or her action is expressive of who he or she is and where he she stands on questions of value. The second face of responsibility Watson called the accountability aspect. Watson argued that someone is accountable for an action if sanctions or benefits are fairly applied to him or her as a consequence of his or her action.

5. Deontology

If one subscribes to the objective approach to ethics and moral action, the system used to determine and evaluate actions is one that may be described as “non-consequential,” in other words, deontological (Beckner, 2004, p. 52). Deontology is duty ethics. Deontology is a rights approach, in so much as rights imply particular duties. According to Griener (2005), deontologist ethical decision-making rules may be: (a) Universal, or impose obligations on everyone, or (b) role specific, or impose obligations only on people who hold certain positions (e.g., professional). Deontology is critical of all utilitarian approaches because utilitarianism fails to recognize certain central feature(s), such as the obligation to respect the essential autonomy of all human beings.

5.1. The rules for deontology

Deontology is a kind of ethical theory that puts its emphasis on universal imperatives like moral laws, duties, obligations, prohibitions, and so on, and is sometimes called “imperativism” (Terravecchia, 2001). A good will is intrinsically good—good in and of itself, not just instrumentally good. Immanuel Kant’s (1724-1804) deontology considered moral value, which depends on the will, which means the end results cannot justify the means. Morality is a system of categorical imperatives; there are no ‘ifs’ about them. Ultimately, there is just one basic law: The categorical imperative, which consists of three formulations. These are the following: (a) “Act as if the maxim of your action were to become by your will a Universal Law of Nature,” which is the “universalizability” law; (b) “Act in such a

way that you always treat humanity, whether in your own person or in the person of any other, never simply as a means, but always at the same time as an end,” and (c) “Act always on the maxim of there being such a will in us that can at the same time look upon itself as making universal law” (adapted from Field, 1996, p. 3).

5.2. Problems with deontologism

There is a major problem in deontologism as well, namely, the problem of identifying the absolute, self-attesting moral principles. Kant tried to establish his catalogue of duties by the logical analysis of ethical concepts. Obviously, deontologism looks at the principle of good intentions. Problem 1 is how does one know what is right? Problem 2 is what is to be done about conflict between two ‘duties’?

6. Conclusion

Since universities can foster integrity by developing academic programs that deal directly with ethical issues and aim to both criticize and improve practice, the conclusion is that the integrity of subtle ethical choices in education should be promoted. Efforts should be made to provide exception-free rules, but often rules are not sufficient for ethical decision making and sometimes make ethical outcomes less likely. It is not enough to teach rules; it is necessary that professionals are sensitive to the reasons for these rules and thus to what are really expectable exceptions. It is in the role of the professional to make the complex ethical judgments as part of his or her everyday work. In short, when one hires a professional, one hires his or her morality.

Consequentialism has two parts of characterization: (a) A definition of rightness in terms of bestness, and (b) a definition of bestness in terms of neutral value realized. Deontologism adds to consequentialism a possible explanation for why there should be an understanding of the diversity of moral values, namely, people’s circumstances may differ.

When making ethical decisions within an educational institution, the relevant facts need to be determined. The ethical principles involved (the standards at risk, the consequences, etc.) must be identified and which principles are most important determined. In the end, the goal of ethical decision-making is to discover whether there are other ways to see the situation and understand the view of stakeholders, professionals, and society.

References

- Ametrano, I. M. (2014). Teaching ethical decision making: Helping students reconcile personal and professional values. *Journal of Counseling & Development*, 92(2), 154-161. doi:10.1002/j.1556-6676.2014.00143.x
- Beckner, W. (2004). *Ethics for educational leaders*. Boston, MA: Pearson Education.
- Brickhouse, T. C., & Smith, N. D. (2010). *Socratic moral psychology*. Cambridge: Cambridge University Press.
- Encyclopedia Britannica*. (2006). Consequentialism. Retrieved from <http://www.answers.com/topic/consequentialism>
- Carroll, R. F. (1996). *Integrity: The organizing principle*. Retrieved from <http://web.utk.edu/%7Eunistudy/ethics96/rfc.html>
- Craft, J. (2013). A review of the empirical ethical decision-making literature: 2004-2011. *Journal of Business Ethics*, 117(2), 221-259. doi:10.1007/s10551-012-1518-9
- Crossan, M., Mazutis, D., & Seijts, G. (2013). In search of virtue: The role of virtues, values and character strengths in ethical decision making. *Journal of Business Ethics*, 113, 567-581. doi:10.1007/s10551-013-1680-8
- Dzurainin, A. C., Shortridge, R. T., Smith, P. A. (2013). Building ethical leaders: A way to integrate and assess ethics education. *Journal of Business Ethics*, 115, 101-114. doi:10.1007/s10551-012-1371-x
- Dostoyevsky, F. (1880). *The brothers Karamazov* (C. Garnett transl., 1957). New York, NY: Penguin Classics.
- Dworkin, R. (1978). *Taking rights seriously*. Cambridge, Territory/Country: Harvard University Press.
- Field, D. (1996). *Introduction to Christian ethics—Non-Christian ethical frameworks*. Retrieved from <http://davidpfield.com/oak-hill-notes/Ethics-011.htm>
- Flores, G., & Porta, L. (2012). The ethical dimension in the passion for teaching. A biographical-narrative perspective in higher education. *Praxis Educativa*, 16(2), 52-61.

- Griener, G. G. (2005). *Public health ethics*. Retrieved from www.phs.ualberta.ca/documents/PHS505ethics.ppt
- Grayson, M. A. (2007). The means to an end. *Trustee*, 60(10), 2-2.
- Handelsman, M. M., Gottlieb, M. C., & Knapp, S. (2005). Training ethical psychologists: An acculturation model. *Professional Psychology: Research and Practice*, 36, 59-65. doi:10.1037/0735-7028.36.1.59
- Huppertz, J. W. (2003). Passion vs dispassion. *Marketing Research*, 15(2), 16-21.
- Jiwani, G. (2011). Uncovering the unknown of government policy decision-making process at senior levels. *International Journal of Science in Society*, 2(3), 309-322.
- Joy, P. A. (2007). Brady and jailhouse informants: Responding to injustice. *Case Western Reserve Law Review*, 57(3), 619-650.
- Keith, K. T. (2005). *Consequentialist ethics*. Retrieved from http://sufficientscruples.com/blog/?page_id=56
- Legge, J. (2013). *Life and works of Mencius* (Book II, pp. 164-165). London, UK: Forgotten Books. (Original work published 1875)
- Markkula Center for Applied Ethics. (2006). A framework for thinking ethically. Retrieved from <http://www.scu.edu/ethics/practicing/decision/framework.html>
- Marquardt, N. (2010). Implicit mental processes in ethical management behavior. *Ethics and Behavior*, 20(2), 128-148. doi:10.1080/10508421003595950
- Marquardt, N., & Hoeger, R. (2009). The effect of implicit moral attitudes on managerial decision-making: An implicit social cognition approach. *Journal of Business Ethics*, 85, 157-171. doi:10.1007/s10551-008-9754-8.
- Moberg, D. J., & Meyer, M. J. (1990). A deontological analysis of peer relations in organizations. *Journal of Business Ethics*, 9, 863-877. Doi:10.1007/BF00382910
- Neukrug, E. S., Lovell C., & Parker, R. J. (1996). Employing ethical codes and decision-making models: A developmental process. *Counseling and Values*, 40, 98-106. doi:10.1002/j.2161-007X.1996.tb00843.x
- O'Fallon, M. J., & Butterfield, K. D. (2005). A review of the empirical ethical decision-making literature: 1996-2003. *Journal of Business Ethics*, 59, 375-413. doi:10.1007/s10551-005-2929-7.
- Reshotko, N. (2006). *Socratic virtue: Making the best of the neither-good-nor-bad*. Cambridge: Cambridge University Press.
- Rowe, C. (2012). .Socrates on reason, appetite and passion: A response to Thomas C. Brickhouse and Nicholas D. Smith, Socratic moral psychology. *Journal of Ethics*, 16(3), 305-324. doi:10.1007/s10892-012-9130-x
- Smart, J., & Williams, B. (1973). *Utilitarianism for and against*. Cambridge, England: Cambridge University Press.
- Smith, A. (2010). On the epistemic incentives to deliberate publicly. *Journal of Social Philosophy*. 41(4), 454-469. doi: 10.1111/j.1467-9833.2010.01510.x
- Terravecchia, G. P. (2001). *Deontologism*. Retrieved from <http://www.swif.it/foldop/dizionario.php?find=deontologism>
- Walker, N. (1991). *Why punishment?* Oxford, Territory/Country: Oxford University Press.
- Walker, K. D., & Donlevy, J. K. (2009). The four ethical commitments in educational administration. *Journal of Educational Thought*, 43(2), 109-131.
- Watson, G. (2004). *Two faces of responsibility in agency and answerability*. Oxford, Territory/Country: Clarendon Press.
- Watson, G. W., Berkley, R. A., & Papamarcos, S. D. (2009). Ambiguous allure: The value-pragmatics model of ethical decision making. *Business and Society Review*, 114(1), 1-29. doi:10.1111/j.1467-8594.2009.00333.x.

SOCIAL NETWORK ADDICTION

Júlia Hong Ventayol Alsina

Facultat de Psicologia, Ciències de l'Educació i de l'Esport Blanquerna, Universitat Ramon Llull (Spain)

Abstract

Introduction: My aim for the project I did in 2011 was to prove that students who are addicted to social network on Internet can possibly fail their annual exams.

It all started when I realized teenagers often used their smart phones, which means they can be online wherever they are. As a consequence, I decided to find out if being addicted to social network has its disadvantages or if there is no bad consequence about it.

For this reason, my objectives were to inform the symptoms of any kind of addiction, to prove if it is true that if you are addicted (I considered that being addicted was to be online for three hours per day) to social network it is more probably that you fail your exams and to know which percentage of probability you are aware to fail and to find out what can influence adolescents to get addicted to social network.

Methods: I created a survey in order to make students (from the first -12 and 13 years old- and the third year -14 and 15 years old- of High School and from the first year -16 and 17 years old- of Bachiller from three different institutions from Barcelona) complete it so as to calculate the percentage of probability to fail an annual course in school.

The most crucial patterns about the social network addiction are: the students age, using your own computer and/or mobile phone and having failed a year already.

Results and Conclusion: After having had all the completed surveys (a total number of 417), I validated that students who are addicted to social network can fail a year in school 2.5 times more than students who are not addicted to this. Moreover, the most influential pattern that might make a teenager addicted to social network is using your own computer/laptop and/or smart phone.

Keywords: *addiction, social network, Internet, adolescent, failure.*

1. Introduction

This project was made in 2012 when teenagers began to use social networks thanks to their smart phones and computers/laptops. It all started when I was worried about the consequences of being addicted to social networks. So my aim was to prove that students who are addicted to social network on Internet can possibly fail their annual exams.

According to Dictionary.com, an addiction is the state of being slaved to a habit or practice or to something that is psychologically or physically habit-forming, as narcotics, to such an extent that its cessation causes severe trauma.

There are two types of addictions that are:

- Drug addiction: the individual is addicted to a substance, which means it is a dependence on a legal or illegal drug or medication. That person is not able to control the drug use and may continue using the drug despite the harm it causes.

- Behavioral addiction: it is similar to a drug addiction except that in the former, the individual is not addicted to a substance but the behavior or the feeling brought about by the relevant action. Social network addiction could be considered a behavioral addiction.

Joaquim González, a psychologist who was interviewed in order to do my researching, affirmed that an individual is addicted to social network when he spends three hours or more using social networks per day.

2. Methods

I first did a survey in September 2011 to 417 adolescents from three different high schools from Barcelona. The teenagers were from the first -12 and 13 years old- and the third year -14 and 15 years old- of High School and from the first year -16 and 17 years old- of Bachiller.

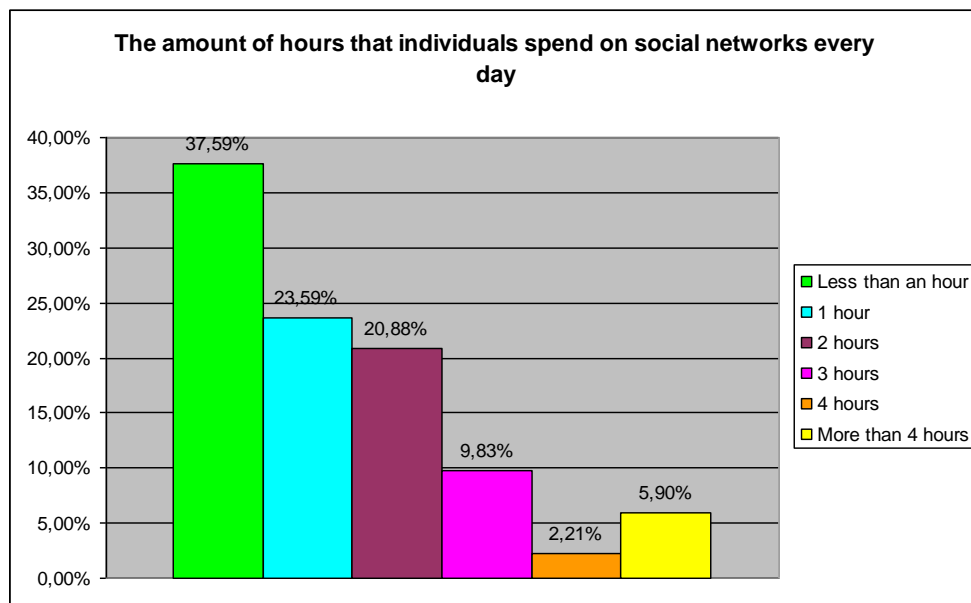
The survey contained 35 questions in total. The most crucial patterns about the social addiction, though, are: the students age, using your own computer/laptop and/or smart phone and having failed a year already.

I did not only use these patterns, but other ones that are not significant due to the lack of enough amount of the results. Microsoft Excel 2003 programme was used in order to do graphics and statistics of the results.

3. Discussion

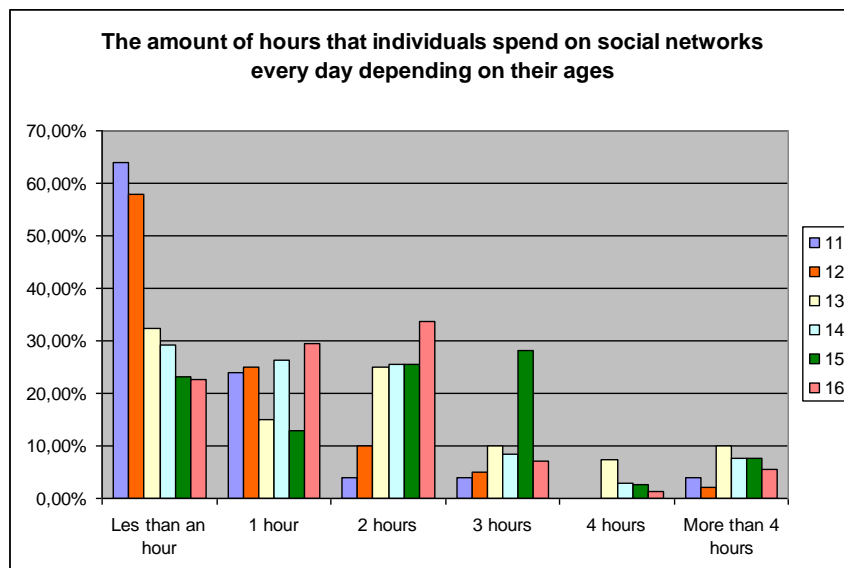
Firstly, I found out the percentage of students that were addicted to social networks, considering being addicted when the individuals spent three hours or more every day, according to the psychologist Joaquim González. It is shown in this graphic the amount of hours that individuals spend on social networks every day. Fortunately, the percentage of students that are addicted is less than the ones who are not.

Figure 1. The amount of hours that individuals spend on social networks every day.



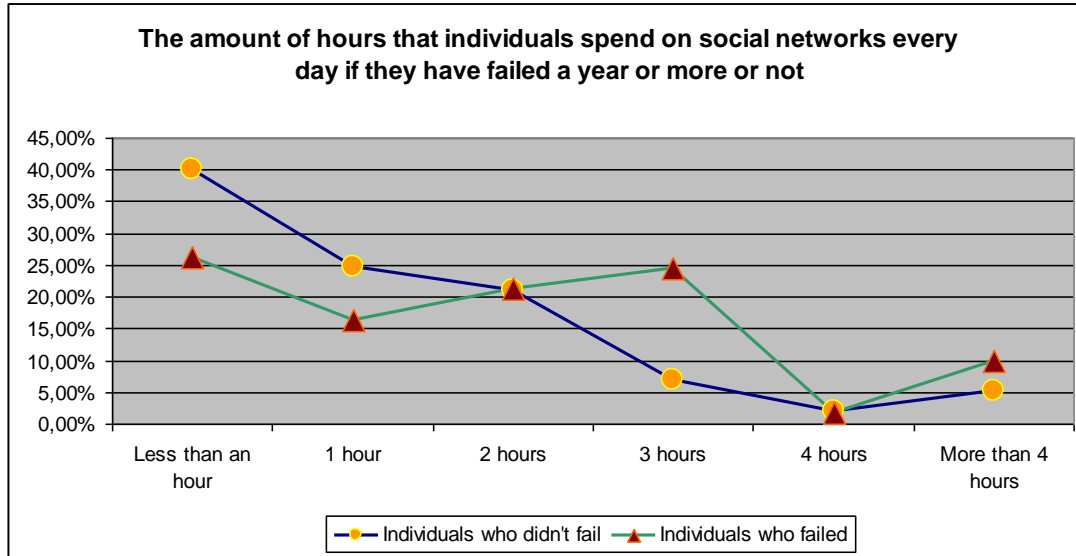
Secondly, it is shown in this graphic the amount of hours that individuals spend on social networks every day depending on their ages, on which is it clear that the most addicted ones are the adolescents who are 15 years old.

Figure 2. The amount of hours that individuals spend on social networks every day depending on their ages



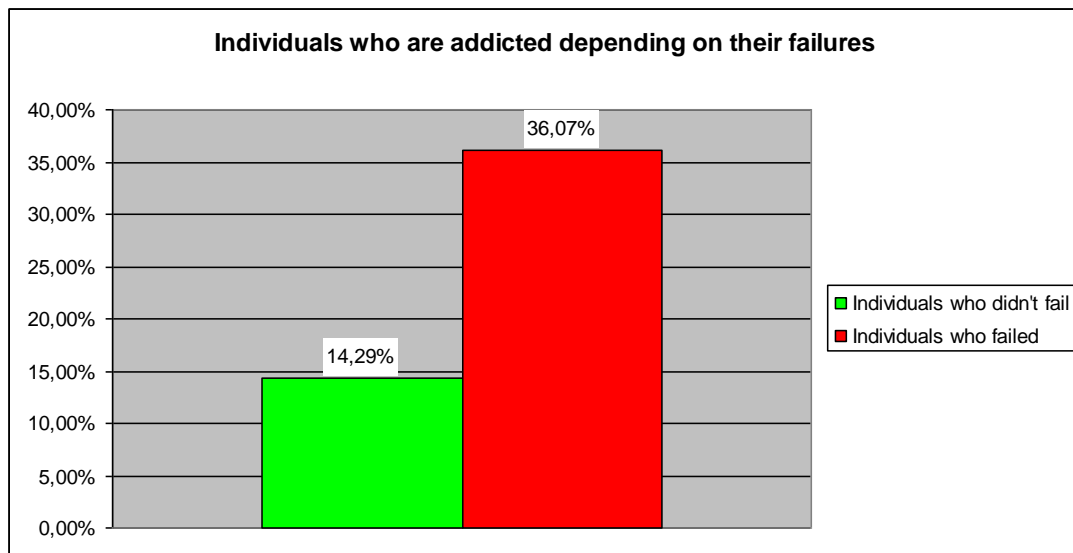
Thirdly, it is shown in the next graphic the amount of hours that individuals, who did not fail and who did fail a year or more in school, spend on social networks every day. It is proved that the amount of addicted adolescents who failed a year or more is bigger than the amount of addicted students who did not fail any year.

Figure 3. The amount of hours that individuals spend on social networks every day if they have failed a year or more or not



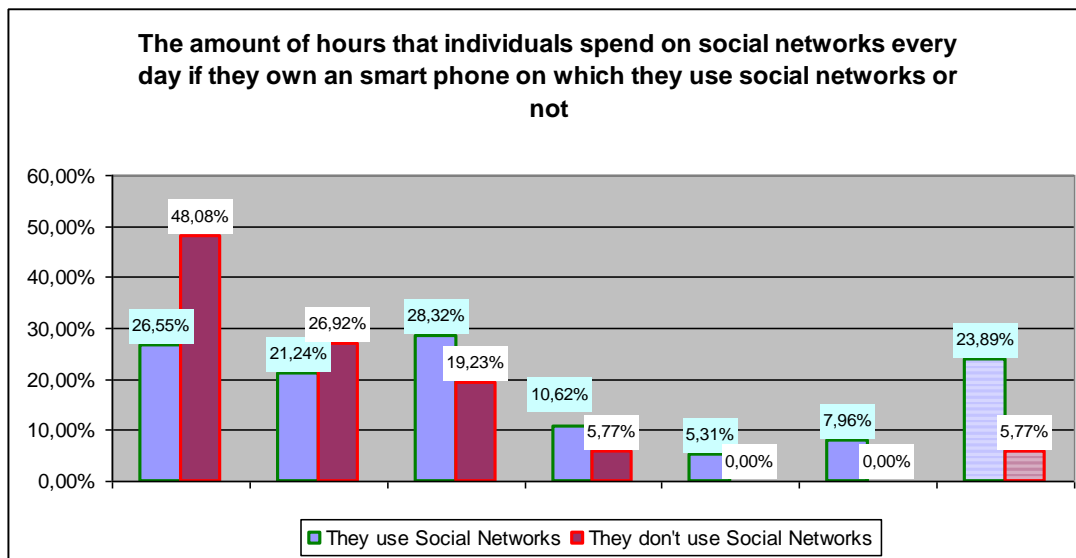
Fourthly, the amount of addicted students who failed is bigger than the ones who did not fail and it is shown in the next graphic in order to see it clearer than in the previous graphic.

Figure 4. Individuals who are addicted depending on their failures



Fifthly, it is shown in this graphic the amount of hours that students spend on social networks every day by using their smart phones as a social tool. It is clear that the ones who use their smart phone as a social network tool are more addicted than the ones who do not use it for a social reason. The two bars that are on the right prove the individuals who are addicted and use their smart phones as a social tool, whereas the other bar proves the ones who are addicted, even though they do not use their smart phones as a social tool.

Figure 5. The amount of hours that individuals spend on social networks every day if they own an smart phone on which they use social networks or not



References

- Alavi, S.S.; Ferdosi, M.; Jannatifard, F.; Eslami, M.; Alaghemandan, H., and Setare, M. (April, 2012). Behavioral Addiction versus Substance Addiction: Correspondence of Psychiatric and Psychological Views. Retrieved April 11, 2015, from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3354400/>
- Dictionary.com. (n.d.). Addiction. Retrieved April 11, 2015, from <http://dictionary.reference.com/browse/addiction>.
- Mayo Clinic Staff. (5th December in 2014). Diseases and Conditions: Drug Addiction. Retrieved April 11, 2015, from <http://www.mayoclinic.org/diseases-conditions/drug-addiction/basics/definition/con-20020970>.

ENHANCING ACTIVE LEARNING IN THE MODERN BIOLOGY CLASSROOM

George M. Malacinski. Ph.D.

Department of Biology, Indiana University, Bloomington, IN 47405 (USA)

Abstract

In large research-oriented universities the typical biology classroom experience is organized around Power Point presentations (PPtPs) that emphasize “information content”. That emphasis on factual content is easily adaptable to courses in “modern biology” which emphasize molecular biology (vs. organismal biology, which emphasizes holistic features, including anatomy, physiology, interspecies relationships, etc.). The reductionist approach of molecular biology, with its focus on details such as nucleotide sequences of nucleic acids, is especially amenable to PPtPs. That type of classroom lecture presentation essentially serves as an “electronic textbook” and thereby replaces the need for expensive conventional printed textbooks, and permits the transfer of large (excessive?) amounts of information from instructor to student during each lecture.

Students usually cope with the enormous amounts of information included in typical PPtPs by using their rote-memorization skills. As well, teachers/professors who have limited time for designing classroom lessons and for personal interaction with students often prefer the formality associated with PPtPs. Frequently, appropriate slides can be downloaded from a variety of internet sites, therefore minimizing lecture-preparation time for the professor.

In order to enhance the classroom learning experience in molecular biology for both high school and university students, a variety of active-learning exercises will be described. These include 3-D model kits, writing exercises, paper cut-outs, etc. Each will be demonstrated, and their advantages explained for generating an active student-oriented learning experience. Enhanced active learning in the classroom permits the design of quizzes and examinations that emphasize analytical, creative thought processes. Such exams supercede conventional “information content” (e.g., multiple choice format) approaches and thereby lead to higher levels of student achievement.

Keywords: *Active learning, Biology classroom, 3-D models*

1. Introduction

Traditionally, high school and college biology courses have been based on “holistic” reviews of the subject. That is, topics and concepts have usually been presented to students in “descriptive” terms. For example, areas such as cell biology, evolutionary biology, transmission genetics, anatomy, physiology, neurology, etc., have been reviewed in the classroom by explaining them in the context of the whole organism, or in groups of organisms.

In contrast, modern approaches to the teaching and learning of biology emphasize understanding, one by one, the various specific processes, structures, and biochemical functions that comprise a fully functional organism. Typically, this modern format utilizes “information flow” (from DNA to protein—i.e., “gene expression”) as the paradigm for learning the similarities and differences among organisms, and their physiological and genetic properties.

It is, of course, assumed that “the whole equals the sum of its parts”. That assumption was long ago challenged (e.g., Wilkins, 1985). Nevertheless, with the advent of routine genome sequencing, the “information flow” teaching/learning paradigm has come to dominate modern ways of researching biological phenomena (e.g., human genetic diseases, molecular evolution, physiology, etc.) and hence, the teaching and learning of biology in the classroom.

This report provides a review of a teaching strategy designed to generate so-called *high-impact educational practices* (<http://www.aacu.org/leap/hips>) in the modern biology classroom. The goal of this strategy is to enhance student engagement (as described by Knight, 2013) and help students better learn about themselves (e.g., Loehr, 2007). That is, the goal is to keep students on task in the classroom (rather

than permitting them to daydream, use social media, skip class altogether, etc.). With this strategy, higher levels of concentration (i.e., deeper thinking) provokes students to engage in “inquiry thinking” (e.g., Walsh and Sattes, 2005), a major goal of science education.

In modern biology (e.g., molecular biology) the information content often appears abstract to high school and beginning college students. Despite the availability of several large format textbooks (e.g., Alberts et al., 2014: 1,464 pages), elaborate colored illustrations (Alberts et al., 1,492 illustrations), and internet animations (e.g., <http://www.dnalc.org/resources/animations/>) some instructors at Indiana University (~ 45,000 total students) have recognized the limitations of “detailed-oriented” biology courses which rely on traditional “transfer of information from the lecturer to the student (so-called “sage on stage” classroom model [e.g., <http://educationnext.org/sage-on-the-stage/>]). Table 1 includes examples of details of biological phenomena which often appear abstract, and therefore difficult to learn in traditional classroom lectures (Shim and Malacinski, 2011).

Table 1. Examples of complex (abstract) phenomena of modern molecular biology

Major and minor grooves of DNA, showing right vs. left handed helix
Protein alpha helix vs. beta pleated structure
Antibody 3-D structure
DNA replication (the most complex process in the living cell)
Role of histones in gene expression

2. Objective

For effective (“long-lasting”) learning strategies for the molecular biology classroom, multiple learning modes/skills are required, including – in addition to at least some rote memorization skills-- a basic knowledge of chemistry, and a capacity for abstract thinking. In order to assist beginning molecular biology students to cope with visualizing and understanding abstract features of the structures and network functions of complex macromolecules such as DNA, RNA, and proteins that comprise information transfer in the living cells, various inexpensive learning tools (Malacinski and Zell, 1996) will be demonstrated. The objective of this learning strategy is to reduce abstract phenomena (e.g., forces that generate protein shape) to more concrete, easier to comprehend visual and tactile explanations. In subsequent (advanced) biology courses students can be expected to be better equipped to upgrade their knowledge with a clear understanding of the basics of information transfer.

These learning tools are inexpensive and therefore can be provided (free of charge) to pairs of students as keepsakes. They have been shown at Indiana University to greatly increase the impact of the learning experience for beginning students.

3. Methods

High-impact educational practices (HIP) are very helpful for some students and even necessary for other students. Some of the ways in which HIP can be built into an updated biology curriculum include the following:

Table 2. Examples of HIP learning aids for generating long-lasting learning experience in modern molecular biology courses

3D cut-out models (e.g., to demonstrate phenomena in Table 1)
Modeling clay to show enzyme shape change
DNA replication kit
Splicing of long “pre-mRNA”
Teamwork poster presentations

4. Discussion

Several advantages accrue to employing simple models in the classroom. Perhaps the most important is the realization (by students) that they have actively engaged in an authentic learning experience. They recognize that their understanding will be soundly based on real and legitimate classroom exercises and thus will likely be long-lasting. Such experiences with HIP will provide a stark contrast to passively taking notes as an instructor lectures in the “sage on stage” mode. Furthermore, observing and interacting with the instructor—as he/she deviates from a prepared script when twisting and turning a model simultaneously as students do the same, provides the additional benefit that the

instructor becomes “personalized”. That “revealing” of themselves by the instructor serves to close the hierarchy gap with students and likely will result in additional class discussion and more frequent office visits with the instructor.

Finally, these classroom exercises should provide students with an intellectual template for preparing their own (creative) 3-D models of one or another molecular process (e.g., protein synthesis, membrane structure, etc.) as they progress through future years of their academic program.

References

- Alberts, B.A., Johnson, A., Lewis, J., Morgan, D., Raff, M., Roberts, K., and Walter, P. (2014) *Molecular Biology of the Cell*. Garland Science: New York.
- Knight, J. *High-Impact Instruction*. Corwin Press: Thousand Oaks, CA.
- Loehr, J. (2007) *The Power of the Story*. New York: Free Press.
- Malacinski, G.M., and Zell, P.W. (1996) *Manipulating the "invisible": Learning molecular biology using inexpensive models*. *Amer. Biol. Teacher*: Vol. 58 (10): 428-432.
- Shim, Y.-H., and Malacinski, G.M. (2011). *Modeling creative approaches to learning complex and difficult phenomena in the university science and technology classroom*. *Intl. J. Arts & Sciences*. Vol. 4 (16): 261-282.
- Walsh, J, and Sattes, E. (2005). *Quality questioning: Research-based practice to engage every learner*. Corwin Press: Thousand Oaks, CA.
- Wilkins, A.S. (1985) *The limits of molecular biology*. *BioEssays*: Vol. 3 (1): 3.

KNOWLEDGE AND RESULT

Eszter Gombos¹ & Maria Csernoch²

¹*University Practice Secondary School, University of Debrecen (Hungary)*

²*Faculty of Informatics, University of Debrecen (Hungary)*

Abstract

Tertiary computer science education has a high attrition rate in Hungary. Students are not able to finish their studies, floating in the system, wasting and using up state and university resources, supporting them in their failure. However, by analyzing multiple sources which would lead to the students' unsatisfactory results, we have discovered that our tertiary education does not fully support students finishing their studies in time. In our analyses we compared the students' acceptance results to tertiary education, their disciplinary knowledge brought from secondary education, and their progress in tertiary education. Our results suggest that there is no direct connection between the students' acceptance results and their disciplinary knowledge, and tertiary education in computer science is not aware of this gap. This lack of understanding between the two levels of our education system would definitely explain the students' high attrition rate in computer science education.

Keywords: *effectiveness, quality teaching in computer science education, attrition rate, standards.*

1. Introduction

In computer science education we are faced with an extremely high attrition rate. Students do not finish their studies, others spend a high number of additional semesters in the hope of achieving their diplomas, and only a very few students finish their studies in time. The reasons which have led us to this very unfortunate situation are many folded but it is obvious that we have reached a stalemate situation in computer science education. In our studies we want to find those quantitative measures which provide background information on how to measure the students' problem solving skills and how to improve effectively their computational thinking and their algorithmic skills, which are necessary to absolve the requirements of these studies.

In the 2011/2012 academic year we have launched the Testing Algorithmic and Application Skills (TAaAS, Csernoch & Biró, 2013) project at the Faculty of Informatics at University of Debrecen, Hungary. The primary aims of the project were to test the level of the freshmen's algorithmic skills, digital literacy, their problem solving approaches, and how they would transform knowledge between traditional and non-traditional programming environments. In the 2014/2015 academic year, when the first tested students reached the official end of their studies, we have extended our project to the TAaAS+ project. Within the frame of this extension we have compared the students' progress during their studies, their acceptance grades to the university, their results in the Informatics and Mathematics graduation exams, and their results in the TAaAS tests.

2. State-of-the-art

According to the expectations of the European Union at least until 2020 we are about to accept an increasing number of students in the Hungarian tertiary education. However, if we would not be able to increase the issuing ability of the universities, the students would be stuck in these institutes, and consequently, increase the teaching load. These "lost" students float in the system being a burden, using up their financial support, and after a while just disappear, without gaining any diploma. It is clear that not the number of students should be increased but the number of graduated students, the number of diplomas (Palkovics, 2015). It was found that one of the reasons for this failure is the low level of general competence of the students accepted into tertiary education, proved by the competence tests administered in recent years. Considering these facts, a new tertiary education strategy is planned to be introduced in the not very far future, which requires further competence analyses (Palkovics, 2014).

3. The sample

Beyond the general incompetence of the Hungarian university students, students of computer sciences perform even worse. In our project, based on the official Hungarian student management system (NEPTUN), we analysed the progress of the Software Engineering (SOE) BSc students of the Faculty of Informatics starting their studies in the 2011/2012 academic year. According to the sample curricula of the SOE BSc, this course is planned to be covered in six semesters.

Data gained from the NEPTUN are compared to the result of the TAaAS tests, administered on the first week of the students' tertiary studies, and to the students' results from secondary education, used in the acceptance process. The comparison of the TAaAS tests and the acceptance points plays crucial role in our analyses, since the TAaAS tests focus on the students' knowledge in computer science, on their level in digital literacy and computational thinking, while the acceptance points rather show the students' general intelligence and their social background. The question was which measurements would predict a successful progress in tertiary computer science education.

For the present studies the NEPTUN was downloaded October 18, 2014, after finalizing the 2013/2014 academic year.

3.1. The calculation of the acceptance level

In the Hungarian education system to enter tertiary education there are no entering exams. Students finish their secondary education, and following it, they pass their graduation exams, which can be done on two levels – intermediate and advanced. There are two ways to calculate the acceptance point to tertiary education. (1) The points arrive from the students' marks from secondary education in five subjects – Hungarian, Mathematics, History, a foreign language, and one selected subject –, 200 points, and from their results in the graduation exams, where the compulsory subjects are the same, only the selected subject can be different, another 200 points. (2) If the students think their marks in secondary education are not satisfactory they can double their results from the graduation exams, consequently 400 points. Beyond this semi-disciplinary calculation extra 80 points can be gathered from passing the advanced level graduation exams, foreign language exams at least on level B2, finishing in the top ten in the national disciplinary competitions, being pregnant and/or having children, being disabled, coming from a disadvantageous family and social background, or arriving from outside of Hungary with a Hungarian nationality. Institutes in tertiary education – referred to personality rights – do not have information which calculation is applied to the students, how they gain their acceptance points. Altogether, 480 points can be collected from previous studies and social background. In addition, the calculating algorithm is under a continuous change, so students in consecutive years enter tertiary studies in different conditions. In the analysed year 200 points were the acceptance level, which means that only 47.1% of the available points were enough to start tertiary education.

We have to emphasize here that starting tertiary education in computer studies neither requires formal studies in informatics nor passing a graduation exam in the subject.

3.2. The TAaAS tests

The TAaAS tests are administered on the first week of tertiary studies in computer sciences and informatics (Csernoch & Biró, 2013). At the Faculty of Informatics we have three BSc courses. In this study we focus on the results of the SOE students entered tertiary education in September 2011, whose sample curricula is planned for six semesters. Consequently, they are the first students who took the TAaAS test and finish tertiary studies officially. The other two courses are planned for seven semesters, and their first results will arrive in the next semester. Considering the timing, from now on in each semester we will be provided with the progresses and results of the students of the following years, which can be compared to the results of the TAaAS tests.

The TAaAS tests consist of tasks considering the students' level of computational thinking in general, their terminology use, and their algorithmic skills. For testing the students' algorithmic skills we have selected two tasks from the national programming contests planned for 5–8th graders. The tasks contain four programs in pseudo code. One is different from the other three in its nature. In this task the output is limited to four possible choices, while the other three tasks are "What do the programs do?" kind, where the students had to explain the programs in natural language sentences.

3.3. The characteristics of the different measures

In *Table 1* we list the major characteristics of the retrospective (prerequisites), the discipline specific in-progress and the closing requirements. The retrospective results are calculated from the students' secondary studies, from their graduation exams, and from their social background (Secondary education, Graduation exam, Social background, SGS). The in-progress results and requirements of

graduation are recorded in the university e-progress book (NEPTUN), entitled Students' Result Assessment (SRA). The third group contains the discipline specific results gained from the TAaAS project (Csernoch & Biró, 2013).

Table 1. Comparison of the different premises during tertiary computer science studies

prerequisites		
SGS	SRA	TAaAS
<ul style="list-style-type: none"> – results from secondary studies – results from graduation exams – extracurricular results – social background 		<ul style="list-style-type: none"> – graduation results in Informatics and Mathematics – TAaAS results in traditional programming – TAaAS results in non-traditional programming
in-progress results		
	<ul style="list-style-type: none"> – the examination of study-paths – length of study – results in exams – results in labs and seminars – discipline specific, crucial subjects and exams – comparisons of the results of the subjects 	<ul style="list-style-type: none"> – post- and delayed post-tests in non-traditional programming environments
closing tertiary education		
	<ul style="list-style-type: none"> – the output of studies – successful, semi-successful results: absolutionarium, closing exam, diploma – time frame – results 	

4. Research questions

- How the acceptance points are related to the in-progress and to the closing results in tertiary education?
- How the acceptance points are related to the discipline-specific knowledge?
- How much tertiary computer education would rely on knowledge built up in secondary education?
- How the graduation exams in informatics affect studies in tertiary education?

5. Results

In the 2011/2012 academic year 120 SOE students started their studies in tertiary computer science education, and 115 students completed the TAaAS test. The section of the two sets consists of 113 students. The NEPTUN downloaded in 2014 October would provide information on the students' current statuses at the university (*Table 2*). Based on these data we have defined three groups of the students:

- finished studies in time (finished),
- left the university earlier, previous to the predicted time (deleted),
- still at the university (active).

Table 2. Students' classification based on their statuses after seven semesters

status	frequency	percent
active	47	41.6
deleted	53	46.9
finished	13	11.5

It is clear from *Table 2* that only very few students (11.5%) were able to finish their studies in time, almost half of them left their studies earlier, and more than 41% of them is still in the education system.

In the following analyses we compare the students' results from secondary education (*Table 3*) and from the TAaAS project (*Table 4*). The acceptance points (AP) are retrieved from NEPTUN, the graduation exam results in Informatics and Mathematics at intermediate and advanced levels (GEII, GEMI, GEIA, GEMA, respectively) from the TAaAS project. The acceptance points show significant differences between the groups (*Table 3*, AP) (Kruskal-Wallis-test, $p = 0.005$). However, the paired comparison reveals that there is only difference between the active and the deleted groups. This means that the acceptance points are not able to distinguish between the finished and the other two groups. This finding is supported by the analyses of the students' results in the TAaAS tests, where their knowledge in programming was tested (*Table 4*).

Considering the results of the graduation exams both in informatics (*Table 3*, GEII and GEIA, at intermediate and advanced level, respectively) and mathematics (*Table 3*, GEMI and GEMA, at intermediate and advanced level, respectively) no significance difference was found at either levels. This means that tertiary education accepts students whose knowledge in the two most important subjects is not clear, and institutes are not prepared for the students' lack of knowledge.

Table 3. Students' results from secondary education

	AP	GEII	GEIA	GEMI	GEMA
max	480	100	100	100	100
active	376.62	85.67	77.14	81.32	87
deleted	350.71	84.95	68.87	74.85	–
finished	383.85	83.50	80.00	83.78	–

Among the traditional programming tasks of the TAaAS project a 4-output task (*Table 4*, 4O) and three "What do the programs do?" type of tasks (*Table 4*, WA, WB, and WC) were included. In the 4-output task no significant different was found between the three groups of students (Kruskal-Wallis-test, $p = 0.3694$). However, all the WA, WB, and WC tasks show significant differences (Kruskal-Wallis-test, $p = 0.0035$, $p = 0.0044$, and $p = 0.0024$, respectively). The paired comparison revealed that these differences are clearly detectable between the finished and the deleted groups in all the three tasks.

Table 4. Students' results in traditional programming environments in the TAaAS project

	4O	WA	AB	WC
active	68.32	68.62	52.13	46.28
deleted	66.67	47.64	39.15	30.19
finished	86.32	86.54	82.69	71.15

The active students seem being those who can learn anything, hopefully, also programming, but it takes longer. The finished students were no better in the general subjects than the others, but arrived with higher level of programming knowledge. It can also be predicted that our education system in computer science is not prepared for students who are well educated in any other subject except programming. This finding suggests that we can succeed only in teaching those students who arrive ready-made, and in any other cases both students and tertiary education struggle. We have to be faced with the fact that secondary education does not develop the students' computational thinking and algorithmic skills to the level which is required in computer science education. It is the responsibility of tertiary education to apply proven effective methods (Mayer, 1981; Kirschner, 2006; Hattie, 2012) to prepare students for high level programming.

6. Conclusion

In the TAaAS+ project we compare the different sources of students' measurement in tertiary computer science education. The reason of our doing is to find explanation for the high attrition rate of computer science students. In the 2014/2015 academic year we have reached the first possible finishing students participating in the TAaAS project, launched in September 2011.

The results of the analyses clearly present that those students who finished their studies according to the prescheduled curricula, arrived into tertiary computer science education with firm knowledge in programming. It has also been found that this result is neither predictable from the students' acceptance grades nor from their results in the graduation exams in Informatics and Mathematics. Being aware of these findings we can conclude that both students and tertiary education are unprepared for students with high level intelligence but low level programming knowledge, and this shortage definitely would explain the extremely high attrition rate in computer science education.

Acknowledgement

The research was supported partly by the TÁMOP-4.2.2.C-11/1/KONV-2012-0001 and TÁMOP-4.1.2.B.2-13/1-2013-0009, SZAKTÁRNET projects. The projects have been supported by the European Union, co-financed by the European Social Fund. The research was supported partly by the Hungarian Scientific Research Fund under Grant No. OTKA K-105262.

References

- Biró, P. & Csernoch, M. (2013). Deep and surface structural metacognitive abilities of the first year students of Informatics. In: *4th IEEE International Conference on Cognitive Infocommunications. 2013 Proceedings*. IEEE, Budapest, pp. 521-526.
- Hattie, J. (2012) *Visible Learning for Teachers*. Routledge.
- Kirschner, P.A., Sweller, J., Clark, R.E. (2006) Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching. *Educational Psychologist*, 41(2), pp. 75–86.
- Mayer, R. E. (1981). The Psychology of How Novices Learn Computer Programming. *ACM Computing Surveys*, vol. 13 (1), pp. 121–141.
- Palkovics, L. (2014) Nem a bolognai rendszer rossz, hanem a magyarországi megvalósítása. <http://www.hirado.hu/2014/10/18/palkovics-nem-a-bolognai-rendszer-rossz-hanem-a-magyarorszag-megvalositasa/>, retrieved February 2, 2015.
- Palkovics, L. (2015) Nem egyetemistából, hanem diplomásból kellene több az államtitkár szerint. http://eduline.hu/felsooktatas/2015/1/13/Palkovics_nem_hallgatobol_kell_tobb_hanem_d_L5D20M, retrieved February 2, 2015.

ENABLING AND DISABLING ENVIRONMENT INFLUENCING LEARNERS' LEARNING EXPERIENCES

Soane Joyce Mohapi

*Centre for Continuing Education and Training (CCET)
College of Education, University of South Africa
(South Africa)*

Abstract

The study examined the enabling and disabling environment influencing learners' learning experiences of grade 3 learners from three primary schools in rural area of Mpumalanga province; South Africa. Thirty learners from were purposively selected from the area of study; ten learners from each school. Three focus group discussions were used one per school, to collect data on supply of text books, teachers' teaching strategies and role of parents in the education of their children, schools' location and physical infrastructure. Detail analysis of enabling and disabling home and school environment underpins an investigation of how environment is linked to learners' learning in the three selected primary schools. The study recommends three factors to be considered to create enabling environment for learners' learning.

Keywords: *Grade 3 learners, rural, environment*

1. Introduction

Following the increased focus on community engagement approaches to teaching, in this article the researcher examines enabling and disabling environment influencing learners' learning experiences using data from the community engagement project which was the initiative of the College of Education at the University of South Africa (Unisa), the project aimed at understanding what learners are saying about their learning through the processes of participation and learner affirmation. Learner-centred approaches consider learners as central to the lesson content (Evenson et al 2008). The researcher wanted to explore this further by investigating enabling and disabling environment and how it influence learners learning experiences.

There are two types of learner-centred approaches, namely task-based learning (TBL) and project-based learning (PBL). In TBL the central focus of the lesson is the task itself; the objective is to complete the task, not to learn the structure of the lesson. To complete the task successfully, learners have to communicate their ideas. TBL allows learners to communicate before performing the task. In the context of this article the PBL approach takes learner centeredness to a higher level. Four elements are regarded as being vital for PBL (Evenson et al 2008): a central topic from which all activities derive and which drives the project towards a final objective; access to means of investigation in order to collect, analyse and use information; plenty of opportunities for sharing ideas, as collaborating, communicating and interacting with other learners is fundamental to PBL; and the freedom to talk about learning. In adopting the PBL perspective in the study we focused on the principles of collaboration, communication and generating new knowledge project. New knowledge from the project gave learners an awareness of their learning needs.

2. Theoretical framework

The pedagogical theories of philosopher John Dewey were introduced much earlier in the twentieth century, and within a more traditional academic context, but they share a similar focus on making education a transformative experience. Dewey (1978) believed that the ideal classroom would be a place where learners used trial and error to develop needed skills for engaging in genuine or "ethical" democratic citizenship. The engagement of learners in their own learning in the sampled schools is in line with the transformation processes in the country. Learning is a process whereby knowledge is created through the transformation of experience (Kolb 1984); in other words, engagement and involvement of

learners in their learning is unavoidable. The 500 schools' project was an engagement with grade 3 learners, the data from the project motivated the researcher to further investigate on how enabling and disabling environment influence learners' learning.

3. Literature review

3.1. Enabling and disabling learning environment

Learning environment is related to supply of text books, teachers' teaching strategies and role of parents in the education of their children, schools' location and physical infrastructure. Learning environment can be positive or negative; a positive environment will enabling learning to take place while in disabling environment will make it difficult for learning to take place. Positive learning environment is a physical and emotional environment that encourages learners' learning (Killen 2000). The learning environment includes provision of resources, infrastructure, and immediate neighbourhood of the school. For learning to take place, the physical environment must be supportive; learners need to be comfortable before they can learn. Every learner must be able to sit down and write where a chalkboard is more visible.

4. Methodology

The study was conducted as a qualitative inquiry using focus group data. A number of ethical issues were considered: confidentiality, anonymity and privacy were respected, the consent of all participants was sought, the researcher explained the aim and purpose of the research to all participants, and feedback was given to participants, both to verify data used for analysis and to comment on interpretation.

4.1. Sampling

The sampling strategy was purposive. Thirty grade 3 learners from three rural primary schools were selected. Following concerns raised by university researchers who contact the 500 schools' project, it became evident to investigate enabling and disabling learning environment in the schools selected to find out the effect of this environment on learners' learning experiences and the extend which the home and school environment influence learners' learning experience.

4.2. Data collection and analysis

Data was collected through three focus group discussions with thirty rural Grade 3 learners, one at each school. The researcher interacted with thirty grade 3 learners from three primary schools form a rural community in Mpumalanga province South Africa. The study adopted Inductive analysis of data. The data was organised into categories and later identified patterns to find out the relationships among the categories. Significant events in the raw data emerged and were grouped into theme

5. Discussion of findings

During the discussion, learners were given the freedom to discuss their learning under two aspects:

When they learn best

When they learn with difficulty

Learners reported that they are finding it difficult to learn if teachers are emotional; in the words of one of the learners:

"I cannot learn when a teacher is angry"

It is evident that a school environment especially a classroom environment should be inviting. A grade 3 learner is still trying to find his/her foot in a school, the teacher represent his/her mother. If a teacher is angry she portrays an environment of fear which is not good for learners' learning.

From the data analysed, it was clear that teachers' inability to explain mathematical operations and their application disable learners' learning. In this regard, a learner asserted that:

"It is impossible to learn mathematics if the teacher is not explaining how to multiply big numbers"

From the discussion held with learners, two categories of responses could be identified:

Things that make learners to learn best and things that make it difficult for learners to learn

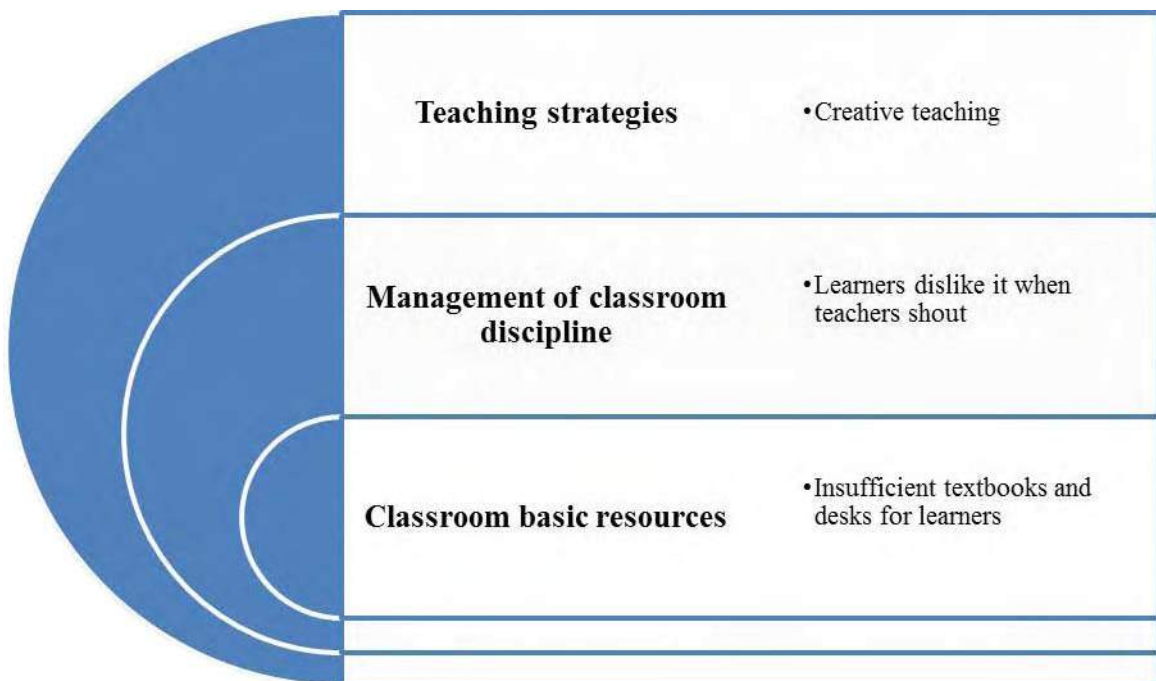
6. Conclusion

The study has found that there are things that contribute towards enabling and disabling learning environment. The three schools participating in this study lack teaching resources, teachers are failing to explain the subject content to learners and are unable to manage learner discipline, they resort to corporal punishment which South Africa Schools' Act abolished in 1996. The interplay of location, teaching strategies and school discipline is quite visible in creating enabling environment for learners' learning.

7. Recommendation

It is on the basis of the finding indicated in this study that the researcher recommends the following model

Figure 1. Three factors to consider when creating enabling learning environment:



7.1. Teaching strategies

According to Killen (2000), there are good and bad teachers. There are teachers who made it easy for learners to learn and those who will make it very difficult to learn. One should note that no single teaching strategy is effective all the time for all learners. For the purpose of this study learning environment could enable learners to learn if teachers were creative in their teaching and used humour in explaining the content of the lesson to learners. This implies using learner- centred approaches which place a much stronger emphasis on the learners' role in the learning process, teachers and learners cooperatively making sure that learning take place.

Learners in the study mentioned that if study materials are supplied and teachers explaining how to respond to homework questions, they will learn best.

7.2. Discipline

The Department of Education has introduced various measures to manage classroom discipline. The study revealed, however, that learners found the methods used by teachers to manage discipline unacceptable. It assumed that it will be impossible to learn in a chaotic environment. According to learners "shouting" cannot solve disciplinary challenges. Learners are unable to learn if teacher call them names. From what learners are saying the manner in which discipline is managed in the school contribute towards disenabling learning environment, and in this type of environment, learning will be difficult. Disorderliness contribute towards chaotic classroom.

7.3. Schools' infrastructure

The findings of the study revealed that study material, toilets and teachers' books were not enough and some not appropriate for grade 3 learners. The quality of school facilities also influences learners' learning. Vulliamy (1987) found persuasive quantitative evidence of the existence of certain factors affecting learning; these include the provision of basic facilities. Vulliamy's study was used to some extent as a yardstick in determining the viability of the school environments and its influence on learning. The three school in this study had similar problem of lack of toilets, chalkboards, books and few classroom and it could therefore declared as disabling environment that affected learners learning negatively.

References

- Chambers, R, (2005), *Ideas for Development*, London, Earthscan Publications. Cited by UNESCO Bangkok (2008), *Reinventing Higher Education: Toward Participatory and Sustainable Development*, <http://unesdoc.unesco.org/images/0016.001631/163155e.pdf>. Retrieved 30 March 2014
- Coetzee, SA, Van Niekerk, EJ, & Wydeman, JL, (2008). *An Educator's Guide to Effective Classroom Management*. Pretoria: Van Schaik.
- Eyler, JS, & Giles, DE, (1999). *Where's the Learning in Service Learning?* CA San Francisco: Jossey-Bass, Inc.
- Gibbs, G, & Simpson, C, (2005). Conditions under which assessment supports students' learning, *Learning and Teaching in Higher Education*, Vol. 1, pp. 3–
- Goddard, D, (2009), *Re-inventing the Civic University*, provocation 12, <http://www.tailoires2011.org/wp-content/uploads/2011/06/Re-inventing-the-Civic-University-John-Coddard.pdf>. Retrieved 16 May 2014
- Govinda, R, & Bandyopadhyay, M, (2011). Access to elementary education Analytical overview. In Govinda, R (ed). *Who Goes to school? Exploring Exclusion in Indian Education*. New Delhi: Oxford University Press
- Killen, R, (2000). *Teaching Strategies for Outcomes-based Education*. Lansdowne: Juta & Co. Ltd.
- olb, DA, (1984). *Experiential Learning*. Englewood Cliffs, NJ: Prentice Hall
- Mabizela, D, (2014). what is community engagement. Rhodes University Grahamstown. Retrieved 17 May 2014
- Macmillan, JH, & Schumacher, S, (1997). *Research in Education: A conceptual Introduction*, 4th edition. New York: Harper Collins.
- Macmillan, JH, & Schumacher, S, (2010), *Research in Education: Evidence- Based inquiry*. United State of America: Pearson Education Inc.
- Oyewole, O, Engagement in African universities: Challenges and prospects. Paper presented at 9th PASCAL International Observatory Conference, Gaborone, 1–3 December 2010
- Pienaar, S, (2012). *Focus Newsletter*. Pretoria: Unisa Press ,University of South Africa
- Report by National Education Evaluation & Development Unit. (2012). Pretoria: Government Printers, Department of Basic Education.
- Report by National Education Evaluation & Development Unit. (2012). Pretoria: Government Printers, Department of Basic Education.
- White Paper on Education and Training in South Africa. (1995). *First steps to develop a new system* Pretoria: Government Gazette, Department of Education.
- University of Manchester (2009) .*Advancing the Manchester 2015 Agenda: The Strategic plan of University of Manchester* <http://www.manchester.ac.uk/medialibrary/2015/2015strategy.pdf>, accessed March 2014
- Van Deventer, I, & Kruger, AG, (2003). *An Educator's Guide to School Management Skills*, Pretoria: Van Schaik.
- (Vulliamy, G (1987). *School Effectiveness Research in Papua New Guinea*. *Comparative Education* 23 (2): 209-223.

THE SOCIOPOLITICAL CONTEXT OF LANGUAGE REFORM IN HIGHER EDUCATION IN POST-SOVIET KAZAKHSTAN

Seth Agbo¹ & Natalya Pak²

¹Lakehead University Orillia, ON (Canada)

²Suleyman Demirel University, Almaty (Kazakhstan)

Abstract

Framed by globalization, post-Soviet Kazakhstan has embarked on initiatives to establish standards and quality educational services for universities to catch up with those in developed countries. Government policy for educational reforms is viewed not only as a means of convergence, that is, catching up with the knowledge-based societies of Europe and North America, but also as a gateway into the EU. Recent government policy calls for trilingual competence, implying a desire to equip future generations with fluency in three languages--Kazakh, Russian and English. Through this initiative, universities are mandating English language as the language of instruction in graduate programs. An integral part of this policy requires university teachers and postgraduate students to have strong scholarly credentials in English. This paper is a case study of language reforms in a major university in Kazakhstan. The study investigated the implications of the English language policy in higher education and examined the challenges posed by the policy on faculty, students and administrators. For example, that English should become the language of instruction in all graduate programs in the universities; that postgraduate students, particularly PhD students have been mandated to have high citation indexes by publishing articles in peer-reviewed English language journals as a condition for graduation from a PhD program; that continuous employment of university faculty depends on English proficiency and publications in the English language; and similarly, that administrators are required to place their universities on the world map by raising institutional standards to the levels required by international accreditation and ranking organizations. Proponents of the language policy initiatives hold the perception that by attempting to graft Western-type education principles onto post-Soviet higher education institutions, Kazakhstan is likely to catch up with the higher education situation appertaining in Western Europe and North America and become globally competitive. The findings however indicated that the efficacy of the current reforms is bounded by the limits of the higher education traditionalism and the long established educational value orientations in Kazakhstan. As a result, to become competitive globally, universities must develop new attitudes and organizational structures as well as improving current practices.

Keywords: *Globalization, higher education reform, convergence, educational policy, English language proficiency.*

THINKING ABOUT EDUCATION

Patricio Alberto Cullen & Liliana Mabel Marinelli

Universidad Tecnológica Nacional Facultad Regional Delta (Argentina)

Abstract

In Argentina have been implemented in the last two decades reforms in the legal system of education systems at all levels whose results have not improved the quality of education but instead have deepened their progressive deterioration, forming a gradual and sustained crisis in the time is strongly affecting fundamental to building a just society pillar: training of its citizens. This negative situation impacts the chances of success of inclusive economic and social policies.

Educational reforms, beyond its laudable goals, have failed in their implementation producing an education that seems deepen an inconspicuous and elegant print increasingly marked social differences manner. Cultural values show signs of deterioration, the importance attached to formal knowledge, and therefore educational institutions and educators, quickly weakens a society that seems to show signs of assessment of academic training as a key driver of equity.

In this framework, university and non-university education has been losing credibility and prestige in recent years.

This paper attempts to reflect critically on the current status of university systems in particular how it impacts the general crisis in the training of engineers, and formulate conclusions.

The methodology used is the observation results in undergraduate assessments, analysis of the academic career of the students in the five levels of the curriculum, case studies segmented by geographical distance students, their schools of origin, level socioeconomic and processing of information obtained, including contrasts observed in attitudinal aspects of students trained in middle school state and private management.

The instruments used were interviews, surveys, surveys in field tests, diagnostic tests and monitoring input "performance" until graduation or dropout early or late.

A priority effort and responsibility required under continuous education policies and long-term, looking at the implementation grant greater autonomy to each unit management system and agreeing with educational associations involving specific measures necessary changes from day to day.

Keywords: *Education, Crisis, Equality*

1. Introduction

The Argentina is going through a deep and prolonged crisis of their education systems, which has tried to revert from the political levels with radical reforms in the legal system and tools to implement them in the Federal Council of Educacion. The principal objective of this work is to postulate that the results have not been as expected, but has aggravated the crisis in education which causes a sharp increase in inequality for the population directly affected by a crisis that is not likely to temper its effects. This population is composed of the two lowest quintiles in the level of income or poor. To come to the diagnosis there has been revised the evolution of the system of revenue from 1995 and analyzed the pupils' cohorts i in 2005 until 2014 in the Regional faculty Delta of the National Technological University using surveys made out to teachers and pupils, evaluations earlier, during and after the University Seminar of Revenue and conversations with managers of schools and of companies and social modality of the region.

Although the analysis has been focused in suction pupils to study engineering it is considered that the sample is sufficiently representative as to reveal the state of the education in general for the reasons that express themselves next:

The applicants' average to the careers of engineering of the Regional faculty Delta is 500 pupils per year, number raised for the population of its area of influence, what is explained for being a clearly industrial area with big companies that prepare products of high quality for the markets of the whole

world in the iron and steel, self-propelled sectors, chemical and petrochemical. The origin of these pupils is of technical schools, and of those of secondary level in its different orientations placed in the most important cities of the region and also of semi urban and rural areas, in all the cases both of state and private management. Also the segmentation is representative for economic level of the familiar group.

Ten studied cohorts were allowed to have excellent information to analyze objectively the conditions in which the applicants come to the engineering careers in the Regional faculty Delta as for the grade of effective appropriation of the knowledge curricular proper from the previous level. Also, in particular, the surveys and interviews show them, they were allowed to postulate with a good possibility of wise moves which is its perception of what means the engineer's profession and its social relevancy and, also, its values scale with regard to the motivation and the commitment to pawn the effort and perseverance that supposes tackling the engineering studies.

The gathering of quantitative and qualitative information during the last ten years of work was administered for its use by the members of the Group of Investigation of Access and Permanence, it created in 2005 and that is developing at present its fourth Project that, like three previous ones, was framed in the paradigm of investigation – action, that is to say that the conclusions of each of the Projects the base was to impel reforms in the design and putting in act of the University Seminar of Revenue tending to change the fundamental problems of the access and permanence in the elected university education, advising even on possibilities of going on to another engineering and, also, one worked with informal tutorship's with the pupils of the first and second level impelling formal support systems in the most arduous matters of the stretch of basic sciences of the careers of engineering and development of concrete hardware for support tutor to the pupils, including the emotional aspects, reporting on the possibilities of social, cultural and sports activities in the ambience of the faculty.

For reasons from which it would turn out to be excessive for the rules established for the presentations in this academic meeting to exhibit and to comment on the volume of information obtained in ten years of work, they have to comment on the analyzed main aspects and the conclusions obtained as regards the problems of the access to the university and the permanence distinguishing what is understood by early desertion (the first and second level and late desertion).

2. Access and Early Desertion

The access across the University Seminar of Revenue (SUI) of the Regional faculty Delta of the National Technological University (FRD-UTN) crossed between 1995 and 2014 substantial changes in its hourly load presential and in its contents determined essentially by the early desertion of students in the revenue itself and in the first and second level. In the first ten years summer courses developed (45 intensive days) of Mathematics, Physicist and Chemist and Workshop of University Orientation with approval instances until June or allowing to study with hanging matters the first four-month period of the first year of the grade. As a result of the increasing desertion in the first year there became more rigid progressively the opportunities of approval of the matters and it passed off the course of five days per week for six summer weeks to a four-monthly course of fifteen weeks from August until November of three days per week, to which one added an optional course in the first four-month period with character essentially of concepts and the possibility of examinations in character of free of pupils who, without studying, were in conditions to approve the last recovery instance for the regular ones of each of the subjects of the revenue. This form of free examinations only was approved in average by one per cent of the ingresantes or not more than five every year (strong indicator of the crisis of the secondary level, because the contents of the SUI are an extract of the contents curriculares supposedly already appropriate. For all the rest these examinations before to the experienced one they have a diagnostic value so that the pupils know that they will have to reach level.

From 2005, and according to the analyses of the evolution of the SUI and of its results, there was solved the formal creation as group of investigation of the Group of Access and Permanence, which quickly gathered to the task of designing a SUI of annual duration with materials of study especially conceived by the members of the GAP for applicants to the engineering careers. Finally in the last years there was extended the hourly load of the Workshop of University Orientation to include basic notions of epistemology and of logic and the mathematics dictation passed of four-monthly to annual remaining others three with four-monthly character.

The summary of obtained results is the one that we provide next:

3. Conclusion

The pupils invoke its step along the secondary school from a critical and declamatory position since they understand that the indispensable knowledge has been transmitted to us to continue with its

studies. They emphasize the poor formation in sciences and the professionals' projection absence in ambiances of development and innovation. One of the arguments explicit the non-conformism with which professionals who dedicated years to its studies, end up by teaching sciences in a secondary school for lack of real possibilities or hourly development on the labor market. On the other hand, many of these pupils, they concluded that in its first steps along the career, the alone target was the economic progress and not the capacity of development or mental opening that could generate learning.

The question is a knowledge of that time what attributes the young people grants him to the education today. For our surprise, 75 % did not see any difference between be educating and without doing it and 56 % might have continued humanistic nature careers if the University that was giving it was located in the outskirts. Therefore, a part of the pupils' population of the career of engineering does it for the closeness that offers him.

Undoubtedly, the interventions that the University has had with regard to implementing extensive courses for learning in the matters earlier mentioned it has been of big help and year by year they can turn the gradual progress in the final results. It even is missing very much, in this way it will follow up to finding the way of motivating the young people and of cheering them up to a formation like engineers.

References

- Bunge, M. *"100 ideas. El libro para empezar a discutir en el café"*. Edit. Sudamericana.
- Bunge, M. *"La ciencia: "Su método y su filosofía"*. Edit. Siglo XXI.
- Cullen, P. (2010). *Universidades para el siglo XXI*. Bs As, Argentina: edUTecNe.
- Cullen, P. (2006) *Hacia el Renacimiento Educativ*. Buenos Aires: edUTecNe.
- Devoto, Roberto, Heinichen, Susana. *"Ingeniería y Sociedad"*. Apuntes de Cátedra ITBA
- Villanueva, E. (2008) *"Reformas de la Educación Superior: 25 propuestas para América Latina y el Caribe"*. En: Tendencias de Educación Superior en América Latina y el Caribe, textos base para la reflexión y el debate en la Conferencia Regional de Educación Superior. IESALC-UNESCO, Cartagena de Indias, Colombia.

CONSTRUCTION OF RUBRICS FOR THE EVALUATION OF TECHNOLOGY COURSES IN COLOMBIA

Luis Fernando Vargas Neira, Fredy Andrés Olarte Dussan & Jhon Jairo Ramírez
Universidad Nacional de Colombia (Colombia)

Abstract

It is internationally recognized that technology education is fundamental for preparing citizens to actively participate in the current society. In Colombia, the Ministry of National Education (MNE) has established the guidelines for teaching Technology and Computer Science in schools through a document that suggests the competencies and competences that primary and secondary level students should reach. However, this document has neither performance indicators nor other mechanisms that allow measuring technological skills and, consequently, teachers only evaluate the student knowledge about a particular software tool instead of competences. As a proposed solution, two analytic rubrics that facilitate the monitoring of the educational process were built. The validation of these instruments was carried out by teachers from ten public schools in the country, who proposed to improve the scope of learning goals, attributes, evaluated skills and measuring scale. These suggestions were applied to the instrument in order to consolidate its structure, define specific skills and obtain a description that agrees with the competencies. At this moment, the rubrics are being used in the ten schools in order to continue their improvement.

Keywords: *Evaluation, rubrics, competence, education in technology*

1. Introduction

Education in technology plays an important role in economic and social development worldwide. Colombia, as other countries, has been working on the inclusion of technology education as an important area within the curriculum for primary and secondary education. In this regard, the MNE decided to include this area in the mandatory curriculum for primary and secondary education imparted in Educational Institutions (EI). This decision was made taking into account the importance of technology education to increase the opportunity of success in work activities, higher education and student's daily life.

In order to guide teachers in the inclusion of technology area in the student education process, MNE published the document "Guide Series #30. Be competent in technology: a need for development", which includes relevant aspects in technology education (MEN, 2008). This document begins with a conceptual framework that establishes basic definitions about the meaning of technology. Then, several relationships between technology and aspects of human evolution, such as: science, ethic and society development are presented. Finally, it describes a set of guidelines that organize educational and evaluative processes in the classroom through a hierarchical organization of components, competencies and performances for each grade of primary and secondary education.

At the top level of this hierarchy, technology education is divided into four components: Nature and evolution of technology, Appropriation and use of technology, Solving problems with technology and Technology and society. At the second level, each component is associated with a competence that needs to be developed within the student learning process in each educational level. At the third level, a set of performances is defined and related to each competence that allows measuring the competence level reached by the students.

However, in the structure described in the MNE document, the assessment of technological skills through performance indicators or other mechanisms is not clear. This assessment is usually performed using tests, short exercises, workshops, exhibitions and papers, but these mechanisms are not always focused on the development of skills and competences (Kimbell, 2012). Usually, these instruments allow the teacher to identify rote knowledge instead of the progress in technological skills development. With

this kind of assessment, the student has no clarity on how she is being evaluated and which is the objective of the educational process (Arsenault, 2005).

This aspect is very important because it has been observed that without guidance in this evaluation, teachers tend to make a subjective assessment focused only on the knowledge of a specific area of technology. As a solution to this need, this article proposes the design of rubrics oriented to the evaluation of student performance in technological competences, particularly for the following components: “Appropriation and use of technology” and “Solving problems with technology”.

The organization of this paper is as follows: In Section 1, the main characteristics that define the rubrics, such as: its classes, features and the design stages are described. Section 2 details the process proposed to build the rubric of the two selected components, the set of performances to evaluate and their related skills. In addition, the selected assessment scale and the construction process of descriptors to identify the level of development of identified skills are included. Section 3 presents the validation process of the constructed rubrics and Section 4 includes the conclusions and future work.

2. Rubrics Design

The rubric or evaluation matrix is a pedagogical tool whose contribution to education has been recognized by teachers worldwide. This instrument allows establishing a measurement mechanism that reports the appropriation level of students on a given performance. Furthermore, it has a scale that allows teachers and students to identify the progress reached and the skills that need to be improved (Kocakulab , 2009).

There are two types of rubrics, which are used depending on the structure and approach of the proposed school activity (Blanco, 2008). The first is an analytic rubric that includes a set of skills regarding to a dimension of each competence; the second is a holistic rubric that combines different dimensions on a single descriptive scale. The analytic rubric is widely used in formative assessment processes, where a more rigorous monitoring is required, while the holistic is utilized when the evaluative process is of the summative type.

For each type of rubric a particular measurement scale is defined: the holistic uses one descriptor and one measurement scale. On the other hand, the analytic rubric comprises several skills that are expected to be developed, a measurement scale that commonly have between three and five levels, and multiple descriptors for each level (Kocakulab 2009). These aspects allow both quantitative and qualitative analysis of the learning process.

2.1. Design stages of an analytic rubric

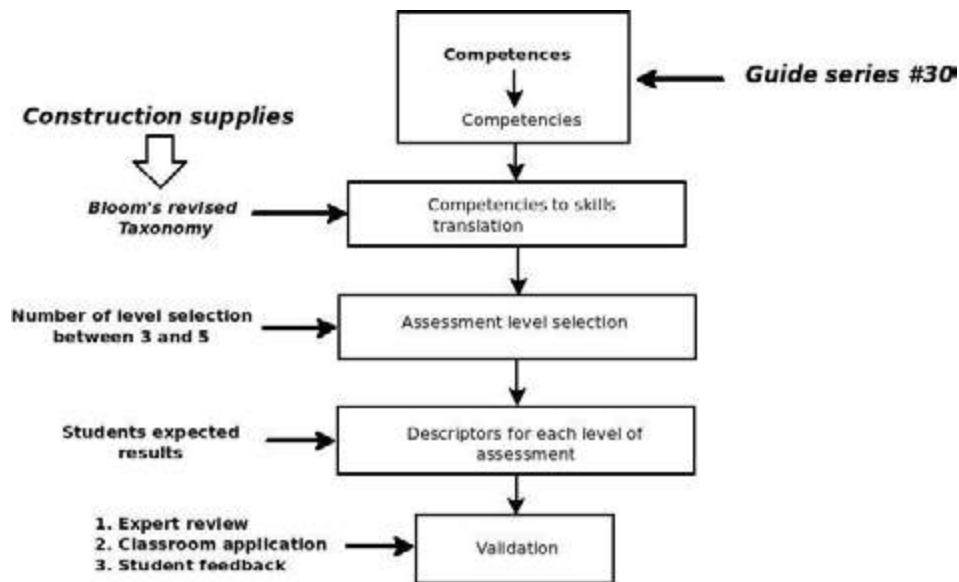
Considering the aforementioned characteristics and the need of a detailed description for the selected components and their skills, the analytic rubric was selected. In this regard, the literature reports a series of steps to construct this type of rubric (Carrizosa, 2007),(Metler, 2001), (Blanco, 2008), (López, 2007):

1. Review in detail the objectives or learning performances and identify the appropriate evaluation criteria, i.e. specific skills to observe in students.
2. Set the levels for each skill and determine a weight for each criterion. It is common to find levels as low, basic, intermediate and advanced (García, Terrón López & Blanco Archilla 2009) and (Andrade, 2000)
3. Generate a complete first draft of the rubric involving skills, descriptors and levels.
4. Perform the instrument validation based on three fundamental stages.

3. Rubrics construction for the selected components

Construction process of analytic rubrics implies four main stages described by (Carrasco, 2007), which are: skills selection based on the learning objectives or competencies, selection of the number of evaluation levels, construction of the descriptors that represent each level and, finally, the validation process. Figure 1 shows the sequence of activities and the required inputs for the rubric construction and validation processes.

Figure 1. Sequence of activities for rubric construction process



For the first stage “translation from competencies to skills”, it was necessary to identify and classify each competency quality on a cognitive level, according to Bloom's taxonomy (Krathwohl, 2002). To achieve this task, the main verb of each competency (defined on the Guide series #30 document) was used. Additionally, the cognitive domain was categorized using the Krathwohl scale and both the learning objective and the student expected results were determined (Martínez, Amante, Cadenato & Gallego, 2012). The remaining items of the competency give additional information to determine the students desired results, which allows establishing the indicators or quality guides (Gatica-Lara, 2012) to assess the student learning.

For example, we translated the following competency: “I propose, analyze and compare different solutions to the same problem, explaining its origin, benefits and challenges”. The main verbs for this competency are: propose, analyze and compare. Each one of these verbs is located in a specific level of the taxonomy (e.g. propose is in the level of creation, which is located at the highest point of the taxonomy). To develop this performance in terms of skills we can use any of the following verbs: to propose, create, prepare and issue, because they belong to the same cognitive level. In this case, we selected 'propose' as the verb to be evidenced by the student, obtaining the next skill: “proposes different solutions to a problem from its advantages and difficulties”.

In the second stage of the instrument development, the assessment scale is defined. After a bibliographic revision, it is concluded that an adequate number of evaluation levels is between three and five, being four the most commonly used (Andrade, 2000). Another criterion for selecting the number of levels is the difficulty to reach the skill and its possibility to be measured (Krathwohl, 2002), (Gatica-Lara, 2012), (Andrade, 2005). According to these criteria, student advances are going to be measured through four evaluation levels (*beginning*, *developing*, *accomplished* and *exemplary*). Furthermore, since describing labels give more information about the educative process results for teachers and students, they were included in the rubric.

For each specific level of the selected skills, it was defined a descriptor that allows assessing and presenting to the student the obtained achievement. For this task, we utilized the Bloom's taxonomy, which includes the cognitive levels, the performance verbs related and the specific attributes of each skill (Krathwohl, 2002). Hence, the construction of descriptors allows representing the main characteristics of each skill and gives to students the opportunity to identify their strengths and weaknesses in the skills proposed for each competency. This aspect is crucial for students because it provides the necessary feedback to correct their mistakes for future activities (Gatica-Lara, 2012).


The last stage of the rubric construction is the instrument validation through teacher and student opinions (Reeves, Stanford, 2009). Taking into account that this process must be adjusted according to the perception of each involved agent, three key steps are developed. The first step consists in the review by designers and experts in educational assessment, in order to set learning goals, skills, measurement scales and descriptors for each one of the skills and their possible levels. The second step allows the instrument validation through its implementation in the classroom and considering teachers' opinion. In this step, the usefulness of the rubric in the learning process, the validity of the rating scale and the

relevance of the proposed descriptors are evaluated. The third step consists in the preliminary review by students, in which they mention if the built descriptors provide feedback to their learning process, explain the goals obtained and give them the opportunity for improvement in the future. Currently the process is in the second step, i.e. it is under review by teachers in the classroom.

Figure 2 shows the structure of the instrument developed to validate the rubrics. Each teacher filled out this instrument individually. Before the evaluation, the instrument and its components were explained to teachers and they evaluate it considering the following aspects: scope of learning goals, evaluated skills, measurement scale, descriptors and its possibility of use in the classroom. One of the skills that received feedback is: “explains the restrictions of a design using text or graphics”. In this case, teachers mentioned the necessity of descriptors with a clear characterization of when a student explains properly and when she does not. Similarly, it is important to describe when a student identifies or not the constraints of a design. Additional contributions were described in the space of *comments* and at the end of the session the opinions and concerns about the instrument were socialized. This information was processed and used in order to generate each level descriptor and improve different aspects of the rubric.

Figure 2. Tool structure for teachers' validation

Component	Competence					Comments
Competency	Skills to assess	Assessment level				
		Beginning	Developing	Accomplished	Exemplary	
Consult and document information	Skill 1					
	Skill 2					
	...					
	Skill n					



Each level Descriptors

4. Conclusions and future work

It has been identified that in Colombian educational institutions the criteria to evaluate technological competences are not clear neither for students nor teachers. The rubric construction and validation was performed in order to evaluate technological skills for the components ‘Appropriation and use of technology’ and ‘Solving problems with technology’. During the validation we noticed that teachers do not have knowledge about rubrics as an assessment mechanism in the classroom. Also, as a down side the design and construction of rubrics implied an increased workload for teachers, but they recognized that this instrument reduces the subjectivity in the evaluative process. Furthermore, rubrics provide clear assessment criteria to the students and give them a consistent feedback of their skills during the development of activities.

As future work, it is expected that teachers use the rubrics in the classrooms of ten public schools in Colombia in order to evaluate their relevance and utility. In this process, teachers and students will perform a second validation stage in which recommendations and suggestions will be generated. Subsequently, the suggestions and recommendations arising from the above process will be implemented and a new version of these instruments will be developed. Finally, it is planned to develop a software tool to facilitate rubric use by teachers and simplify the processing and interpretation of the resulting information.

Acknowledgments

This paper could be constructed by Colciencias and the Ministry of Education, entities through the center CIER contributed to its development.

References

- Andrade, H. G. (2000). Using rubrics to promote thinking and learning. *Educational Leadership*, 57(5), 13-19.
- Andrade, H. G. (2005). Teaching with rubrics: The good, the bad, and the ugly. *College teaching*, 53(1), 27-31.
- Arsenault, J., Godsoe, S., Holden, C., & Vetelino, J. (2005, October). Integration of sensors into secondary school classrooms. In *Frontiers in Education, 2005. FIE'05. Proceedings 35th Annual Conference* (pp. S2F-33). IEEE..
- Barbosa, H, Peñalvo, F & Rodriguez, M. (2010). Defining Adaptive Assessments Using Open Specifications. Springer (Ed). Technological Developments in Education and Automation (189-193). doi: 10.1007/978-90-481-3656-8_36
- Blanco, A. (2008) Las rúbricas: un instrumento útil para la evaluación. Universidad Complutense de Madrid. September, 20, 2014: <http://www.ipc.pe/Curso%20Didactica%202012/4-Las%20rubricas-Angeles%20Blanco.pdf>
- Bo, H., Qing, F., & Yi, Z. (2010, April). Situational Creation of Simulated Teaching in Electrical-Mechanics Major. In *Wearable Computing Systems (APWCS), 2010 Asia-Pacific Conference on* (pp. 359-362). IEEE.
- Carrasco, M. Á. L. (2007). Guía básica para la elaboración de rúbricas. September, 20, 2014: <https://0a45eabe-a-62cb3a1a-s-sites.googlegroups.com/site/planeandoprimaria/informacion-tecnica/guiabasicaparalaelaboracionderubricas/gua-bsica-para-la-elaboracin-de-rbricas-1203558263164031-3.pdf>
- Collofello, J. S. (2002). Creation, deployment and evaluation of an innovative secondary school software development curriculum module. In *Frontiers in Education, 2002. FIE 2002. 32nd Annual* (Vol. 1, pp. T2C-8). IEEE.
- De Vries, M. (2012). Philosophy of Technology. Williams (Ed). Technology Education for Teachers (137-167). Rotterdam: Sense Publishers.
- Diaz, F. (2006). La evaluación autentica centrada en el desempeño: una alternativa para evaluar el aprendizaje y la enseñanza. Del Bosque Alayon (Ed). Enseñanza Situada: Vínculo entre la escuela y la vida (125-161). Mexico: Mc Graw Hill Interamericana.
- García García, M. J., Terrón López, M., & Blanco Archilla, Y. (2010). Desarrollo de recursos docentes para la evaluación de competencias genéricas. *ReVisión*, 3(2).
- Gatica-Lara, F., & Uribarren-Berrueta, T. D. N. J. ¿ Cómo elaborar una rúbrica?.: September, 15, 2014: http://riem.facmed.unam.mx/sites/all/archivos/V2Num01/10_PEM_GATICA.PDF
- Krathwohl, D. R. (2002). A revision of Bloom's taxonomy: An overview. *Theory into practice*, 41(4), 212-218.
- Kimbell, R. (2012). Understanding assessment its importance; its dangers; its potential. Williams (Ed). Technology Education for Teachers (137-167). Rotterdam: Sense Publishers.
- Kocakulah, M. S. (2010). Development and application of a rubric for evaluating students' performance on Newton's laws of motion. *Journal of Science Education and Technology*, 19(2), 146-164.
- Martínez, M., Amante, B., Cadenato, A., & Gallego, I. (2012). Assessment tasks: center of the learning process. *Procedia-Social and Behavioral Sciences*, 46, 624-628.
- McCollister S (2002) Developing criteria rubrics in the art classroom. *Art Educ* 55(6):46
- Mertler, C. A. (2001). Designing scoring rubrics for your classroom. *Practical Assessment, Research & Evaluation*, 7(25), 1-10.
- Reeves, S. T. A. C. Y., & Stanford, B. (2009). Rubrics for the classroom assessment for students and teachers. *The Delta Kappa Gamma Bulletin Fall*, 24-27.
- Spendlove, R. (2012). Teaching Technology. Williams (Ed). Technology Education for Teachers (35-54). Rotterdam: Sense Publishers.
- Stoll SA (2003) Assessing elementary students. *Strategies* 16(1):33
- Min. Educación. (2008) Serie 30: Ser competente en tecnología: Una necesidad para el desarrollo. Serie 30, 1, 2008.

PERFORMANCE CALIBRATION THROUGH PARTLY PEER ASSESSMENT

Yonghuai Liu¹, Honghai Liu², Yitian Zhao³ & Ran Song⁴

¹*Department of Computer Science, Aberystwyth University (UK)*

²*School of Computing, University of Portsmouth (UK)*

³*School of Mechatronic Engineering, Beijing Institute of Technology (P.R. China)*

⁴*School of Computing, Engineering and Mathematics, University of Brighton (UK)*

Abstract

In this paper, we will discuss the assessment of a second year image processing module. The module has been run for more than 10 years, its syllabus has been kept relatively stable, but its contents have been slightly changed and updated over years due to the feedback from students mainly on mathematics and programming. It is assessed through two pieces of work: demonstration with partly peer assessment, and an essay in the form of a scientific paper about the complete details of the work shown, with an expectation of incorporating the feedback from the demonstration. The demonstration takes up 40% of the module assessment, the essay takes up the remaining 60%. Each student marks the demonstration of the others. Of the 40% total for demonstration, 20% will be based on the assessment of the (one) teaching staff and 20% on the assessment of the class. While the background and commitment of students vary from one year to another, the partly peer assessment plays a role of performance calibration, resulting in the average marks of the whole module of the class being relatively stable from 55 to 60% over years. Such finding will be useful for the assessment of the modules which are relatively challenging and the exams may not be suitable due to their open-ended and/or problem solving nature.

Keywords: *Module assessment, performance calibration, partly peer assessment, demonstration, exam*

1. Introduction

Teaching in a university is always challenging due to the rapid change of the world: techniques, life styles, job markets, products, etc. In this case, students usually have different objectives and aims with regards to why they choose to enter a university: some want to learn and prepare for their future and career, whilst the others may just want to get a certificate. In addition, students vary in background, knowledge, capability and commitment. This reality and phenomenon shows that more thinking is required in order to make most students, if not everyone, happy and achieve what they expected.

Nowadays, almost everyone has experience in capturing and using images in one way or another, using a mobile phone or a digital camera. However, clearly, such captured images will be affected by, for example, the illumination conditions under which they were captured. Sometimes, the illumination conditions are not ideal, leading the captured images to be of low quality and contrast, making them difficult to interpret. Image processing is thus almost always necessary in order to obtain high quality images. It has the following three objectives: (1) restore images, taking a corrupted image as input, and then outputting a clean image; (2) enhance images, taking the low contrast image as input, and then outputting an image which is more friendly for the end user to interpret; and (3) understand images, making the images meaningful to the end user.

An image processing module may need to cover various aspects: introduction, color space, image formation, image compression, image enhancement, texture, and image classification, for example. In the process, various mathematical tools have to be introduced for the manipulation of the image data. In order to test various techniques, programming is necessary. However, both the mathematics and programming involved may prove challenging to some students.

The assessment of a module is a critical part of higher education. But it is normally challenging due to various factors: different requirements from the stakeholders (Bloxham, 2008), for example. Even so, the information derived from the assessment process should be accurate, dependable, meaningful, and appropriate (Brookhart, 1999), since it directly affects the student's motivation and academic choice. The assessment process should produce scores that can differentiate objectively between the higher and lower performing students (Wosik, 2014), relative to the learning objectives (Biggs, 2003).

A module can be assessed mainly in two ways (Biggs, 2003): (i) the traditional model: we teach and then we test, or (ii) we rank students along a quantitative scale usually through ‘marking’, and then allocate grades to different students. The former is mainly about absolute performance; students will get what they get from assessment and may be biased by the assessment contents and marking criteria and practice. For example, the exam questions may be too difficult, the marking criteria may not be appropriate, or the marking itself may be too harsh since the marking staff may have different ideas and beliefs when marks should be awarded. In this case, the absolute performance may not always reflect the true performance and effort of the students, mainly due to the fact that a reference is missing: how do we compare the actual answers from students and an example answer from a teaching staff, and what happens if an example answer is either missing or not comprehensive for the reflection of the knowledge actually delivered by the teaching staff or learned by students. The latter is more about relative performance and rank of students in a class: some statistics of students’ performance will be fixed, irrelevant to the actual performance of the students. It can overcome some shortcomings of the former: the exam questions may be too challenging and marking may be too harsh. However, it prescribes the distribution of the performance of students which may not reflect the actual capability and commitment of students at all.

In this paper, we report the teaching and assessment of a second-year image processing module. As peer assessment can act as a learning tool, supporting students to make effective and informative judgments (Bloxham and West, 2007), it was used as a component for the module assessment. In contrast to the aforementioned traditional assessment means, we argue that partly peer assessment may provide a useful alternative component for the calibration of the actual performance of students. Such practice shows a sincere commitment to the encouragement of student autonomy in learning and student responsibility for critical evaluation of their own work (Langan and Wheeler, 2003). It is also in line with the guidelines from ENQA (ENQA, 2009) that when possible, the assessment should not rely only on the judgment of a single examiner. Such a method is especially useful for the assessment of modules, where exams are not suitable due to their open-ended and application orientated natures such as programming modules and image processing modules.

2. The teaching of a module

The module is open to the second year university students in the department of computer science. In this case, it is reasonable to assume that the students have a good background in mathematics, and skills and experience in programming. Even so, two lectures and two workshops are still scheduled on the mathematical techniques to be involved and marking criteria and programming for image operation. Through these, (i) main mathematical techniques such as probability, interpolation, convolution, and similarity are introduced; (ii) the marking criteria are clarified and some abstract terminologies such as the quantitative and qualitative evaluation of techniques are explained; and (iii) the image loading, data manipulation, and image generation in Java programming language are demonstrated. Such demonstration programs can be clearly used as a starting point for students to learn the subsequent topics and attempt their assignment.

The whole module has a nature of problem solving and is delivered mainly through lectures and workshops from the end of September to the beginning of November in each academic year. It covers the following topics: introduction, color space, image formation, image compression, image enhancement, texture, and image classification. The Introduction chapter shows the imaging modalities and image formats, the Color Space chapter discusses how to visualize and interact with the imaged data, the Image Formation chapter covers some principles for the 3D world to be projected onto the 2D image plane and how the projected 3D world can be characterized and represented, the Image Compression chapter discusses techniques for the effective storage of the imaged data, the Image Enhancement chapter introduces and demonstrates various techniques for the enhancement of image contrast, the Texture chapter discusses the techniques for the description of regions (a set of continuous pixels) in a given image, and finally, the Image Classification chapter introduces some techniques for the description and classification of images and how the performance of different techniques can be quantified.

While the module has been run for more than 10 years, its syllabus has been kept relatively stable, but its contents have been changed slightly due to the feedback from students mainly on mathematics and programming.

3. The assessment of a module

The module is assessed through two pieces of work: demonstration within 5 minutes followed by a 5 minute question and answer session, and an essay in the form of a scientific paper. The marking

criteria are listed in Table 1. The rationale for doing a demonstration before the final paper submission is for students to show what they have done and collect feedback from their peers and relevant teaching staff, so that they can learn from and incorporate these feedbacks into the paper they have to submit later, improving their domain-specific skill (van Zundert, Sluijsmans, van Merriënboer, 2010). To clarify what is actually expected from either the demonstration or the paper, a workshop was run, explaining different criteria, giving some warning about what they should pay attention to, and showing them some example papers from the past years and asking them to comment. To facilitate the students to approach the assessment, another workshop was arranged, showing them how to read images into a Java program, how to extract data, how to manipulate data, and how to wrap up the processed data back into an image for display and visualization. The demonstration marks are calculated as the average of the marks from the teaching staff and the average of the marks from students. It is compulsory for the students to attend all the sessions. The absence of one session leads to a reduction of 5% of the total marks of the module.

Table 1. The marking form for the image processing module

60%	Quality of paper	Maximum	Awarded
	Project statement	10%	
	Description of relevant algorithms and techniques	20%	
	Experimental outline	10%	
	Quantitative results	15%	
	Qualitative results	15%	
	Conclusion	10%	
	Bibliography	5%	
	Wow factor	15%	
40%	Demonstration (To be assessed at the demo to the peer group)	100%	
	Problem statement	15%	
	Algorithm summary	15%	
	Sensible output	40%	
	Quantitative results	20%	
	Clarity and coherence of the demonstration	10%	
	TOTAL	100%	

4. Actual assessment of the demonstration

The demonstration is scheduled inside the normal teaching rooms with necessary facilities available at the end of November and the beginning of December, about two or three weeks after the module is delivered. The students are scheduled according to the topics they selected. The earlier the topics covered in the lectures, the earlier the demonstration. In the process of scheduling and demonstration, special circumstances were taken into account. In these cases, the demonstration may be rescheduled, leaving some early topics to be demonstrated later. In each session, at most five students were scheduled and all the students were given the marking sheets, allowing them to write the awarded marks and any comments they may have on the particular demonstrations from their peers. Students were reminded that they should mark and comment seriously, so that they could reflect the actual performance from particular students and these students can learn from such comments when they write the scientific papers. After all the demonstrations have been made, the teaching staff collect the data from all the students and collate and send them to students as feedback within one week since the completion of all demonstration sessions. To help students to learn, a summary of all the comments and the performance of all the students are also made and sent out.

5. Results

In this section, we analyze in detail the performance of students with and without calibration. The results are presented in Figures 1 and 2 and Tables 2 and 3. Figure 1 shows that the marks given by students are usually higher than those given by the teaching staff (one in this case) with a difference as large as 25 marks. Such an observation has been confirmed by Table 2 where the difference in marks given by students and teaching staff is on average as great as 8.48 in the academic year (AY) of 2014-2015, 14.07 in 2013-2014, and 8.24 in 2012-2013. In general, the difference is almost as large as a grade. These results show that students usually loosely apply the marking criteria to the demonstrations of their peers. Figure 1 (left) shows even an extreme case that one student gave an average of 92.5% to their peers. In this case, the marks given by some individual students may be not reliable. These observations verify those made in (Langan and Wheeler, 2003) that students were more generous, awarding 5% higher marks, in (Isaacs, 2001) that many students find it uncomfortable to grade friends or fellow students too

harshly and in (Brown & Knight, 1994) that friendship marking results in over-marking; and ‘decibel marking’ results in the noisiest or most dominant getting the highest marks. These findings have been verified by Table 2, which shows that the marks received from their peers and teaching staff are highly correlated. However, the correlation between the marks received and given by students is low, if there is any correlation at all. This is because the former measures the average performance of different students, while the latter measures the average judgments of performance of different students. This means that the marks received by their peers must be combined together and are relatively reliable and thus can be used as a reference for the calibration of performance of students. Otherwise, these marks are not reliable and informative. Such findings confirm the conclusions made in (Falchikov, Goldfinch, 2000) that overall peer marks agree well with teacher marks, in (Liu and Carless, 2006) that students are reasonably reliable assessors, and in (Langan and Wheeler, 2003) that peer-assessment of student presentations for summative purposes is feasible.

Figure 1. The scatter plot of the marks from staff and the average marks from students received in plus signs and giving in circle signs in the academic year of 2014-2015 (left), 2013-2014 (middle) and 2012-2013 (right).

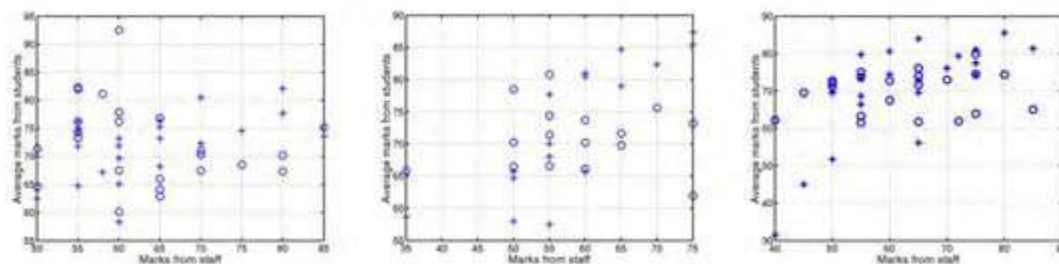


Figure 2. The mark difference before and after calibration of performance for students from academic year of 2014-2015 (left), 2013-2014 (middle) and 2012-2013 (right) respectively

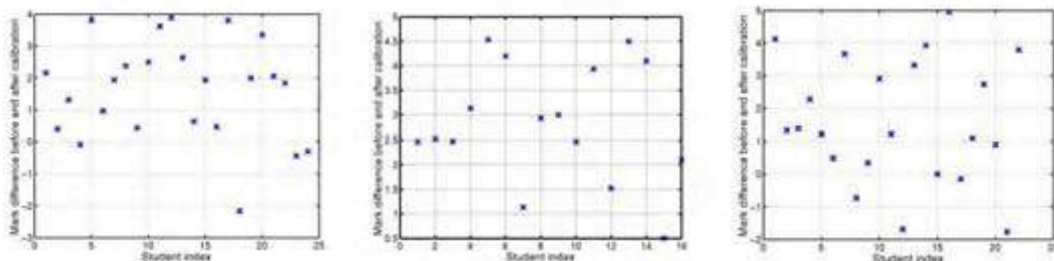


Table 2. The average marks received (AMR), from staff (AMS), and giving (AMG) by a number N of students in different academic years and their correlation coefficient C.

AY	N	AMR	AMS	AMG	C(AMR, AMS)	C(AMS, AMG)	C(AMR, AMG)
2014-2015	24	71.93	63.45	72.48	0.52	-0.23	-0.36
2013-2014	16	72.51	58.44	71.03	0.83	0.00	-0.01
2012-2013	23	70.38	62.14	69.77	0.72	0.13	0.10

Table 3. The average and standard deviation of marks of the class with (AW and SDW) and without (AO and SDO) calibration of performance from the peer marking of demonstration in different academic years.

AY	AW	SDW	AO	STO
2014-2015	56.52	13.79	54.95	13.57
2013-2014	55.88	14.95	53.20	14.69
2012-2013	56.27	16.84	54.73	16.71

Figure 2 shows the difference of the marks of different students before and after calibration. In some cases, this is as large as 5 marks. This is significant in assessing and reflecting the genuine performance and effort of students. What is more important is that students were treated differently, reflecting the common opinions of other students. While 50% of the marks of demonstration came from the peer marking, this weight can be clearly increased in order to make sure that the average marks of students are around 60% without using any subjective linear scaling, and thus providing more objective methods for the calibration of the performance of students. Table 3 shows the difference in the average and standard deviation of marks of the whole module of the class in different AYS. Interestingly enough, the average performance of the class has been maintained in the range of 55-60% through calibration, even though the number and the background of students vary from one year to another. The performance of students was calibrated through the peer assessment of the demonstration component required for the assessment of the whole module. The final marks of the class were all accepted by the university examination boards and external examiners as a whole without any further adjustment. The students did enjoy and were stimulated by the process of peer marking, learned from each other and found the process rewarding.

6. Conclusion

In this paper, we investigated the issue of the calibration of performance of students. Our research shows that the partly peer assessment is useful, providing at least an alternative component for assessing the performance of students. However, it is necessary to bear in mind that the marks given by some individuals might not be reliable. In sharp contrast, the marks received from different students should be combined together and are then highly correlated with those given by teaching staff. In this case, the peer assessment does provide a useful alternative component for manipulation in the process of the assessment of a module and calibration of performance of students. After integration, the marks from students are usually reliable enough for rectifying the marks of students differently and objectively and thus may avoid the bias from either students themselves or teaching staff alone. This practice is in line with the guidelines from ENQA (ENQA, 2009), that when possible, the assessment should not rely only on the judgment of a single examiner. Such a method will be particularly useful when modules such as programming and image processing are difficult to assess in the form of exams due to their open-ended or problem solving nature. While the marks given by different students were equally treated in this research, they may be treated differently (Langan and Wheeler, 2003; Liu & Carless, 2006), so that they are more objective in acting as a reference for the performance calibration of students in the future.

References

- Biggs, J. (2003). Aligning teaching and assessing to course objectives. Learning and Teaching Support Centre, <https://www.heacademy.ac.uk/sites/default/files/biggs-aligning-teaching-and-ssessment.pdf>
- Bloxham, S. (2008) Assessment in teacher education: stakeholder conflict and resolution. *Practitioner Research in Higher Education*, 2(1), 13-21.
- Bloxham, S. and West, A. (2007) Learning to write in higher education: students' perceptions of an intervention in developing understanding of assessment criteria. *Teaching in Higher Education*, 12(1), 77-89.
- Brookhart, S. (1999) The art and science of classroom assessment: the missing part of pedagogy. The George Washington University Press.
- Brown, S. & Knight, P. (1994) Assessing learners in Higher education. London, Kogan Page.
- European Association for Quality Assurance in High Education (2009). Standards and guidelines for quality assurance in the European Higher education area. 3th ed. Helsinki: European Association for Quality Assurance in Higher Education (ENQA)
- Isaacs, G. (2001) Assessment for learning. Brisbane, the University of Queensland.
- Falchikov, N., Goldfinch, J. (2000) Student self-assessment in higher education: a meta-analysis. *Review of Educational Research*, 70(3), 287-322.
- Langan, A.M. and Wheeler, C.P. (2003) Can students assess students effectively? Some insights into peer assessment. *Learning & Teaching in Action*, 2(1).
- Liu, N.-F. and Carless, D. (2006) Peer feedback: the learning element of peer assessment. *Teaching in Higher Education*, 11(3), 279-290.
- Nicol, D. (2009) Transforming assessment and feedback: enhancing integration and empowerment in the first year. Mansfield: QAA.
- Wosik, D. (2014). Measuring the quality of the assessment process: dealing with grading inconsistency. *Practitioner Research in Higher Education*, 8(1), 32-40.
- Van Zundert, M. Sluijsmans, D., van Merriënboer J. (2010) Effective peer assessment processes: research findings and future directions. *Learning and Instruction*, 20, 270-279.

GENDER DIFFERENCES IN THE IMPLEMENTATION OF SCHOOL-BASED ASSESSMENT IN A MALAYSIAN STATE

Arsaythamby Veloo¹, Ruzlan Md-Ali² & Hariharan N. Krishnasamy³

¹*School of Education and Modern Languages, Lecturer, Universiti Utara Malaysia (UUM), Sontok, Kedah (Malaysia)*

²*Institute for Advanced Research in Education (IARE), Director, UUM College of Arts and Sciences, Universiti Utara Malaysia, Malaysia (UUM) (Malaysia)*

³*School of Education and Modern Languages, Lecturer, Universiti Utara Malaysia (UUM) (Malaysia)*

Abstract

School-Based Assessment (SBA) was implemented in Malaysian primary schools in 2011 and secondary schools in 2012. Since its implementation, teachers have faced several challenges to meet the aims and objectives of the SBA. Based on these challenges, this study intends to identify the differences in assessment knowledge, school support, teacher readiness, teacher skills and challenges faced by teachers based on gender in the implementation of SBA. In addition, this study identifies the relationship between knowledge, school support, teacher readiness, teacher skills and challenges that teachers face in the implementation of SBA. The research participants were 243 teachers who were teaching Grade 8 students comprising 60 (24.69%) male teachers and 183 (75.31%) female teachers. The questionnaire was designed by the researcher to determine school support (12 items), teacher readiness (20 items), teacher knowledge (16 items), teacher skills (12 items), and challenges faced by teachers (29 items) regarding the implementation of SBA. The findings show that male teachers are more ready to implement SBA when compared to female teachers. Male teachers also believe that school support is more important when compared to female teachers. In terms of knowledge, skills and challenges towards SBA, there are no significant gender differences. Similarly, the main subjects do not show significant gender differences in the implementation of SBA. The five factors include knowledge, school support, teacher readiness, teacher skills, and challenges faced show significant relationships except school support and challenges faced in SBA. All stakeholders especially teachers are responsible and play a critical role in the implementation of SBA to ensure the quality and standard of assessment.

Keywords: *challenges, gender, knowledge, school support, skills, teacher's readiness*

1. Introduction

1.1. Background of Study

SBA was implemented in primary schools beginning with Year One students in 2011 with the intention to improve educational standards in UPSR 2016. Secondary schools implemented the SBA beginning in 2012 (Talib 2013). PBA has been launched with the intention to produce world class human capital. The educational transformation that took place starting from 2010 was to move towards a school based system to overcome the inherent weaknesses in an exam-driven system. The new system intends to evaluate students continuously based on performance starting from year 1 till Year 11 in various aspects, in addition to examinations. Five approaches will be used through this psychometric assessment, that is, student personality, cocurricular activities, assessment at the school level and assessment at the Malaysian Examination Board level and public examinations.

The new assessment involves SBA which has been integrated as an important component of the school assessment policy. The assessment is conducted on an ongoing basis by subject teachers in the process of teaching and learning. SBA is conducted by subject teachers according to the stipulations outlined by the Malaysian Examinations Board (Nor Hasnida at al., 2012). The five main components which complement the implementation of the National Education Assessment System (NEAS) are school assessment, centralised assessment, centralised examinations, co-curriculum and physical activities assessment as well as psychometric tests (Khodori, 2008). SBA cannot be viewed as a new form of assessment as it has been accepted and implemented in countries such as Australia, New Zealand, England, Scotland, Canada and South Africa (Barley, 2013).

The inclusion of SBA as a component of the centralized assessment is part of the process that will contribute to the success of the NEAS in future. The successful implementation of the SBA depends on the leadership of the school heads. The leadership of headmasters is needed in the implementation of the SBA so that its overall objectives are met and do not deviate from the original purposes. Headmasters play the key role in the implementation of SBA in schools and need to have a deep understanding of the concepts, principles and procedures for the implementation of the SBA (Boon et al., 2011). Headmasters need to support and assist teachers from all aspects of the implementation of the SBA and resolve all problems arising in connection with the implementation of SBA. The student perspective is important as it indicates how the whole assessment is conducted and whether the student assessment outcomes follow the measures given for the SBA. SBA is regarded as a tool to more accurately reveal the true ability of a student, reduce the limiting effects of “exam fright”, and to increase the confidence of students as they have already learnt and brought to practice the examination contents and skills during the conduct of their SBA projects (Barley, 2013).

SBA is seen to be advantageous as it can reduce student anxiety because students have obtained a certain percentage of their marks before they sit for the actual examination (Kerr-Phillips, 2007). Additionally, this strategy is based on an effort to make schooling more fun and mark a shift away from examination-oriented national educational assessments (Curriculum Development Division, 2009). Educational leaders, administrators, and teachers are faced with questions regarding the best ways to motivate students and accurately report their progress (Popham, 2011).

The implementation of SBA poses some challenges to teachers. Teachers are now required to use the online reporting system, document files and manage the various types of assessments. These are not merely new developments in the educational transformation system but could also be less teacher-friendly. The overall impact of these new developments is that assessments for excellent students might not meet the original objectives of the SBA. Teachers could be satisfied with the implementation of a test at the highest difficulty level to determine the student’s achievement. On the other hand, teachers who teach the low achievers or students from the weaker classes might feel more stress. Some teachers might take shortcuts by helping students to answer questions that are beyond the students’ abilities and show this as evidence of high achievement levels (Utusan Malaysia, 2014). Furthermore, the weak implementation of the SBA has led to more teacher criticisms because they are burdened with additional clerical work (Malaysian Insider, 2014).

Teachers encountered problems completing the assessment according to schedule and ensuring the authenticity of assessment; hence leading to the question of whether the teachers are capable and have sufficient knowledge to carry out the SBA (Kamil, 2008). The greater resistance to SBA has come from teachers who perceive it to be an additional burden in terms of time and workload, which suggest that further teacher professional development is needed along with even more support from educational authorities (Hamp-Lyons, 2009).

1.2. Gender differences in assessment knowledge, school support, teacher readiness, teacher skills and challenges faced by teachers

Some research has been conducted to evaluate school support for the implementation of the SBA based on gender. An initial study was conducted by Boon et al. (2011) in all national schools in the districts of Kota Tinggi, Johor. The respondents were 57 headmasters. Questionnaires were used to elicit information. The aim of the study was to determine school administrative support to implement the SBA based on gender. The findings showed that there were no significant gender differences. A study by Rosni and Siti Fatiha (2010) on 60 secondary school teachers who taught examination classes in Grade 9 and Grade 11 in Kota Bharu state showed an average mean score of 0.67 for gender differences among the participants for teacher readiness. This means that there are no gender differences in teacher readiness to conduct the SBA.

A study by Ikhsan (2013) on 157 primary school teachers found that there were no statistically significant gender differences for the teacher knowledge component in the implementation of the SBA. This means that male and female teachers have similar perceptions on the implementation of the SBA. The study conducted by Rosni dan Siti Fatimah (2009) with 23 male teachers and 37 female teachers showed that there were no gender differences in terms of readiness to improve knowledge, skills and develop expertise in the implementation of SBA. A quantitative study on challenges faced by teachers in the implementation of SBA was conducted by Ikhsan et al. (2013). The sample comprised 15 primary school teachers. 61 were male while 96 were female. Gender differences were evident in the challenges as time was deemed to be insufficient to implement the SBA. This finding is similar to the findings in the study conducted by Aidarwati Baidzawi (2013) in which 9 male teachers and 41 female teachers were involved.

1.3. Research objectives

This study intends to identify the differences in assessment knowledge, school support, teacher readiness, teacher skills and challenges faced by teachers based on gender in the implementation of SBA. In addition, this study identifies the relationship between knowledge, school support, teacher readiness, teacher skills and challenges that teachers face in the implementation of SBA

2. Method

2.1. Sampling

The sample size was 269 teachers who taught the SBA subjects and 272 students. 200 of the teacher respondents were male while 69 were female.

2.2. Instruments

The instrument used in this study was a questionnaire designed by a lecturer to measure the implementation of SBA on different dimensions. The instrument consisted of two separate parts, one for teachers and the other for the students. The questionnaire for teachers comprised items on the subject, gender, school support (12 item- $\alpha = .90$), teacher readiness (20 item- $\alpha = .90$), teacher knowledge (16 item- $\alpha = .94$), skill (12 item- $\alpha = .94$) and challenges (29 item- $\alpha = .94$). A 5-point Likert scale was used in the questionnaire. Numbers were assigned to each of the options, that are, *strongly disagree* (1), *disagree* ((2), *moderately agree* (3), *agree* (4), and *strongly agree* (5). The reliability test was to ensure that the questionnaire was valid. The correlation coefficient ensures reliability. A score level of .70 or more is generally accepted as representing a good level of reliability (Litwin, 1995, p31).

3. Finding

3.1. Respondents' Profile

A total of 243 teachers who taught in Grade 8 in secondary school were involved in the study. From this total number of teachers, 60 (25%) teachers were male while 183 (75%) were female.

3.2. Gender towards school support, teacher readiness, teacher knowledge, teacher skills and challenges in the implementation of SBA

Levene's test shows no significant differences ($p > .05$) between gender and school support, teacher readiness, teacher knowledge, teacher skills and challenges in the implementation of SBA. These results assume equal variances between male and female teachers towards school support, teacher readiness, teacher knowledge, teacher skills and challenges in the implementation of SBA. The independent test shows a statistical significant difference ($t(241) = 2.76, p < .05$). The mean score for male teachers (3.57) is higher than the mean score for female teachers (3.29) for the school support in the implementation of SBA (Table 2). The independent test shows a statistical significant difference ($t(241) = 2.68, p < .05$). The mean score for male teachers (3.47) is higher than the mean score for female teachers (3.23) for teacher readiness in the implementation of SBA (Table 1).

The independence sample t-test [$t(241) = .61, p > .05$] shows that there is no significant difference in the teacher knowledge towards the implementation of SBA based on gender. The independent sample t-test shows that there is no significant ($t(241) = 1.75, p > .05$) gender difference in terms of teacher expertise and also no significant ($t(241) = -1.01, p > .05$) gender difference in challenges faced by teachers in the implementation of SBA.

Table 1. Results between male and female teachers towards school support, teacher readiness, teacher knowledge, teacher skills and challenges in the implementation of SBA

Themes	Gender	N	Mean	SD	df	t	p
1.School support	Male	60	3.57	.67	241	2.76	.01*
	Female	183	3.29	.69			
2.Teacher readiness	Male	60	3.47	.67	241	2.68	.01*
	Female	183	3.23	.57			
3.Knowledge	Male	60	3.64	.60	241	.61	.55
	Female	183	3.58	.58			
4.Teacher skills	Male	60	3.53	.72	241	1.75	.08
	Female	183	3.37	.58			
5.Challenges	Male	60	3.65	.50	241	-1.02	.31
	Female	183	3.71	.43			

3.3. Relationship between assessment knowledge, school support, teacher readiness, teacher skills and challenges faced by teachers

The Pearson correlation test shows that there is a significant positive relationship ($r = .40$, $p < .01$) between school support and teacher knowledge in the implementation of SBA. This positive relationship shows that strong school support will enhance the level of teacher knowledge in the implementation of SBA while weak support from the school will result in a lower level of knowledge in the implementation of SBA. The relationship between school support and teacher knowledge is low ($r = .40$).

The Pearson correlation shows a significant positive relationship ($r = .65$, $p < .01$) between teacher readiness and teacher knowledge in the implementation of SBA. The positive relationship shows that when the level of teacher knowledge is high, the level of teacher readiness is also high to implement the SBA, and vice versa. The relationship between teacher readiness and teacher knowledge is average ($r = .65$). The Pearson correlation shows a significant positive relationship ($r = .65$, $p < .01$) between teacher skills and teacher knowledge in the implementation in SBA. This positive relationship shows that when the level of teacher knowledge is high, the level of teacher skills is also high, to implement the SBA and vice versa. The relationship between teacher skills and teacher knowledge is average ($r = .65$). The Pearson correlation test shows a significant negative relationship ($r = -.15$, $p < .05$) between the challenges faced by teachers and teacher knowledge in the implementation of SBA. This negative relationship shows that when the level of teacher knowledge is high, there are low levels of challenges faced by teachers to implement SBA, and vice versa. The relationship between challenges faced by teachers and teacher knowledge is weak ($r = .15$) (Table 2).

Table 2. Results for teacher knowledge, school support, teacher readiness, teacher skills and challenges faced by teachers in the implementation of SBA based on subject

	(1)	(2)	(3)	(4)
Teacher knowledge	.40**	.65**	.65**	-.15*
School support (1)	1	.54**	.52**	-.11
Teacher readiness (2)		1	.74**	-.26**
Teacher skills (3)			1	-.25**
Challenges (4)				1

4. Discussion

4.1. Gender differences in assessment knowledge, school support, teacher readiness, teacher skills and challenges faced by teachers

The results show that school support is very important in the implementation of SBA. Male and female teachers view school support differently. Male teachers feel that school support is very important in the implementation of SBA, unlike most of the female teachers. This result contradicts with the findings of a study conducted by Yusof and Mohd Musa (2011) which showed that there were no gender differences among teachers in Johor, the southernmost state in Peninsula Malaysia. The level of teacher readiness, too, shows differences. The results show that male teachers are more ready to be totally engaged with the SBA when compared to female teachers. This finding contradicts with the findings in Rosni's (2010) study.

Table 3 shows that there are no gender differences in terms of knowledge. This shows that the teachers involved in SBA have the experience and knowledge in their respective subjects. This finding concurs with the findings in Ikhsan's (2013) which show that male teachers and female teachers have the same perception on the implementation of SBA. The findings show that there are no differences in terms of teacher skills in the implementation of SBA based on gender. These findings are similar to the findings in a study conducted by Rosni and Siti Fatimah (2009).

The results of the Pearson correlation test shows a weak or average positive test between school support, teacher readiness, teacher skills and teacher knowledge in the implementation of SBA. The only negative relationship was between challenges faced by teachers and teacher knowledge in the implementation of SBA, and the negative relationship was weak.

5. Conclusion

The SBA has been designed and implemented so that the standard of education in Malaysia is able to further improve and meet world standards. Teachers on the whole are aware of their role in the implementation of the SBA. The successful implementation of SBA will be determined by the

commitment shown by teachers and the cooperation of all the stakeholders in the Malaysian education system. If implementation is guided by the objectives and appropriate practices to achieve SBA, it will create a positive school environment in which students will be able to realize their potential in a harmonious environment. The positive school environment will be conducive to reduce social problems that are prevalent among school-going children and encourage school attendance. This will be a meaningful transformation to the educational experience in Malaysia. In short, studies such as this will provide information that can be used by curriculum designers, policy-makers and administrators to continually make improvements to the SBA.

References

- Azlin Norhaini Mansor, Ong Hee Leng, Mohamad Sattar Rasul, Rose Amnah Raof & Nurhayati Yusoff (2013), "The Benefits of School Based Assessment", *Asian Social Science* . Vol. 9, No. 8, Pp. 98-106.
- Barley, S. Y. (2013), "Perspectives of school-based assessment in the NSS curriculum through the eyes of the administrative and teaching stakeholders in Hong Kong". *Hong Kong Teachers' Centre Journal*, Vol.12,Pp. 21-48.
- Boon, Yusof , Shaharudin & Mohd Musa (2011). Kepimpinan guru besar dalam pelaksanaan pentaksiran berasaskan sekolah di Sekolah Kebangsaan Daerah Kota Tinggi Johor.pp1-9
- Hamp-Lyons, L. (2009), "Teacher based assessment: an international perspective on theory and practice". *TESOL Quarterly*, Vol. 43, No 3, Pp. 524-530.
- Ikhsan Othman, N. M. (2013). "The Implementation of School Based Assessment In Primary School Standard Curriculum". *International Journal of Education and Research*, Vol. 1, No. 7.
- Nor Hasnida Md Ghazali (2012), "Why Do We Need To Change?": Teachers' Attitude Towards School-Based Assessment System, SCR London's 1st International Conference on Social Sciences and Humanities in the Islamic World on 28-30 May.
- Kamil, K. H. (2008), "The Implementation of the School-Based Oral English Test; A Case Study. Unpublished master dissertation, *MARA University of Technology*, Malaysia.
- Kerr-Phillips, F. (2007, August). "School-based assessment: The need, the reality, the future: A perspective from the independent examinations board of South Africa". Retrieved from http://www.iaea.info/documents/paper_1162d20227.pdf
- Khodori et al. (Utusan Malaysia: 2006, Oktober 26). "Pentaksiran Berasaskan Sekolah – Cara Australia". *Ministry of Education*, Malaysia.
- Popham, W. J. (2011). "Classroom assessment: What teachers need to know". *Pearson*. Boston.
- Talib, M. A. (2013). "Perception towards SBA implementation among teachers in Malaysian's school", (Pp.194-200).
- Rosni Zamuddin Sidek & Siti Fatimah Mohamed Salleh. (2010). "Kesediaan Guru Sekolah Menengah Di Daerah Kota Baharu Dalam Melaksanakan Sistem Penilaian Prestasi Pelajar Berasaskan Sekolah". *Universiti Teknologi* , Malaysia.
- Utusan Malaysia (2008). "Membangun Modal Insan". Konvesyen Nasional PIPP Kedua. <http://sppkkedah.blogspot.com/2009/10/membangun-modal-insan.html>
- Utusan Malaysia (2014). "Antara Kefahaman Guru dan Penjelasan". http://www.utusan.com.my/utusan/Rencana/20140213/re_06/Antara-kefahaman-guru-dan-penjelasan

ADVANCED COMPUTER TECHNOLOGY FOR ASSESSMENT AND MEASUREMENTS THE LEVEL OF KNOWLEDGE OF THE UNIVERSITY STUDENTS

Gennadiy Burlak¹ & Jose Alberto Hernandez Aguilar²

¹Center for Research in Engineering and Applied Science, Autonomous University of Morelos State (UAEM) (México)

²School of Accounting, Administration and Informatics, Autonomous University of Morelos State (UAEM) (México)

Abstract

Objective of this paper is to develop an advanced application of the computer technology for assessment and measurements the student's level of knowledge online. We use client-server approach based on the natural process of evaluation where the college students (clients) are tested by a virtual examiner (server). Our motivation is to allow a quick examination in parallel of different groups on remote places on any subject in a unified framework by means of the internet. We report on such developed system that can run in both training and control mode. At the end of the evaluation, the student will receive the statistics of his/her evaluation (grade and rating) in a user-friendly interface.

Keywords: *Computer Technology, Testing online, remote students' recognition, protection against cheating, fingerprint recognition.*

1. Introduction

The formal training for fundamental disciplines is impossible without mastering of the underlying concepts, and the ability to use them for solving practical problems to acquire new and more complex knowledge on this basis. It is senseless to make decisions for a difficult task with a weak possession of the subject's basics. The teacher and student should have an opportunity to obtain a quick quantitative estimation of the level of basic knowledge for their subsequent correction. The teacher's routine control is not effective, because leads to an overload; he does not leave time for the lecturer to engage in creative work -depth enough- with the best students by the study of more complex topics of a subject. With the usual control the teacher spends greatest volume of his time on the students' care. The computer programs are called to unload the teacher, and allow appropriate work organization in a computer class to make such control available to everybody (Bugai, Burlak, Demchenko and Kuz'menko 1997).

Is possible to say on-line assessments are useful to evaluate the students' knowledge; they are used around the world for schools -since elementary to higher education institutions- and recognized training centers of very important companies like the Cisco Company (CISCO, 2015).

Solving second and third question we are not sure, in traditional tests "copying from another student during a test" and "using banned crib notes or cheat sheets during a test" is categorized by the students as cheating (Carnegie, 2005) and several research (McCabe y Trevino, 1996; McCabe y Trevino, 1997) have shown is common practice. Scenario changes drastically when exams can be done remotely through the Internet (Morris 2005). One of the basic problems to solve is to know: who is there?

Is it acceptable to us as a society to tacitly accept cheating as a fact of life and not be so shocked when it comes to light? Students don't stop at graduation, as we have seen in recent scandals in business and journalism. And cheating or cutting corners in one's professional or personal life can cause real damage—both to oneself and to others. We need to care about it (Carnegie, 2005).

2. Grade as the evaluation of the Student's basic knowledge level

First we discuss the structure of the testing knowledge. Let us assume the knowledge base (KB) as a collection (set) of the coupled questions-answers (x_i, f_{ij}, T) (records). In such a collection x_i is the

asked question and f_{ij} are the proposed answers to this question, i is the current number, j is number of answer in the list of proposed answers, and T is time to test. Here $i \leq N$, $j \leq N_a$, N is number of records in the collection, and N_a is number of proposed answers. To the sake of simplicity we further refer to the experts (teachers) knowledge base as the etalon KB. We assume that answers f_{ij} are ordered on the closeness to the correct answer. Then $F_i = f_{i1}$ is the correct answer to i -th question.

In general the normalized knowledge Z may be defined as:

$$Z = \frac{1}{N} \sum_{i=1}^N f_i, \quad (1)$$

(We note that before the presentation all data undergo to random mixing.) At evaluating, the question is addressed to the student and his answer is compared with the corresponding correct answer. After testing the initial collection is extended with obtained results, e.g., obtained answers and other relevant information (response time, rating, etc.). After test, the initial collection is extended by the obtained answers, and there contains all necessary information for the estimation of the student's knowledge.

There are two different types of examination. In first type the student must recognize the correct answer from several predefined variants f_{ij} (the closed-ended form of the test). In the second type the system allows the student to write his answer freely (the open-ended form of the test). Obviously that in the first case (closed-ended test) the verification problem of the answer can be solved easily. But this problem requires much more efforts in the case of open-ended test. Since the correct answer can be written in various but equivalent forms, the reduction problem of the answer to the unique referenced form has obvious solutions only for the simplest cases. But in general such a problem may turn out quite involved. Here we pay main attention to the closed-ended test case.

3. Educational security

Due problems of information security are so common today, it is not surprising that problems of "educational security" could be common too (Rove, 2004). The Faculty who has not taught on-line often asks about cheating. Specifically, they ask how do you know the person who is taking the class is the one who signed up? Unless photo IDs are checked and all course work occurs inside of a monitored classroom, faculty really does not know for sure whether the student is who they say they are in the classroom or on-line (MSU, 2006).

In on-line assessments in which we are not sure who is taking the test; students will be under pressure, some students perform unfairly poorly under pressure and this is a good incentive to cheat (Rove, 2004). We have a wide spectrum of documented techniques to commit cheat on on-line assessments: modify a grade in the database (DB), to steal answers for questions, to copy from another student or cheat sheets, impostor or substitute remote students, to search for answers on the Internet, on the messenger or cellular phone, in single words to "commit cheat" to obtain a "better grade" in an online assessment (Hernandez et al. 2006).

For many kinds of student performances, the potential for cheating in an on-line course is not different than the potential for cheating in a classroom based course (MSU, 2006), besides using traditional mechanisms to cheat, students are using new technologies like cellular phones, i-pods, the messenger and the Internet to commit this dishonest practice.

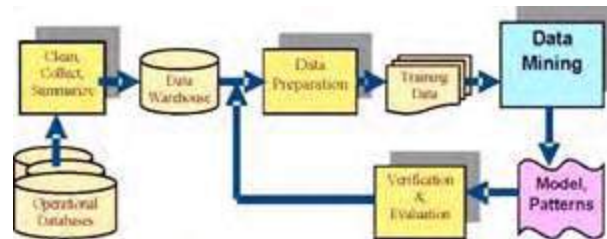
An on-line assessment is composed by assessment items, each assessment item includes the question, available answers and the information required to be processed (IMS GLOBAL Learning Consortium, 2015). A common practice to avoid cheating is the use of a large pool of assessment items to customize assessments. However, even with a large pool, a different danger is that students may be able to log in as the instructor and read the answer key themselves. Most assessment software is protected by short passwords—in Blackboard these can be as few as eight characters, easy to guess with today's systematic "cracker" software (Rowe, 2004).

4. Use of data mining to detect students cheating and suspicious behaviour

Our discussion focus on the student's behavior under the on-line assessment environment, for instance students are more likely to cheat if they observe other students cheating or if they perceive that cheating is allowed. Our proposed model to help organizations to detect and to prevent cheats in on-line assessments. First we analyze different student personalities, stress situations generated by on-line assessments, and the common practices used by students to make cheat to obtain a better grade on these exams. Later we present our DMDC (Data Mining to Detect Cheats) model based on what we call the

summary of best practices; here we analyze the designed database schema to register the student's information. We used Weka (WEKA, 2015) to carry out data mining to find behavior patterns that fits suspect profiles to detect cheats in on-line assessments. "Weka is unique because it's easy to use and understand, and provides a comprehensive environment for testing methods against other existing methods" (FRST, 2006). Finally, we discuss the results obtained by applying of the proposed model and summarize our conclusions.

Figure 1. KDD Schema and Data Mining



5. Use of Data Mining and Biometric Recognition to Detect Students Cheating and Suspicious Behaviour

5.1. Related work

An advanced security measure can be implemented by means of biometric technologies; they may provide added robustness in access control to high security facilities within higher education. As the unit price for biometric devices continues to fall it is possible to employ these to replace the current systems used for workstation and network access (Wasniowski, 2006). These devices are likely to become a standard computer peripheral, built into future workstations.

The use of biometrics in on-line assessments is new and is planned to use as initial step for on-line assessments of migrant workers in the United Kingdom. Immigrants will complete self-assessment tests on-line "wherever possible" before contacting immigration officials, although the on-line self-assessment would only cover the initial stages of an application. Basic questions will be asked, such as the purpose of a visit to the UK, the planned length of stay, qualifications held and work experience already gained. Lower-skilled people from outside the EU (European Union) will have less chance of entering the country to work, said the government (Savvas, 2006).

Now, is evident to us, the educative and technological importance of biometric recognition, but besides discussing the application of these technologies, our intention is to analyze the impact of its applicability in online assessments to support professors day to day activity, and provide an objective assessment of students over a secure environment. In next section we define the problem at hands; on second section we explain the Methodology we used for our experiment. On the third Section, we describe the characteristics of our made at home Online Testing System with Biometric Recognition (OTSBR), its technical requirements, the performance schema, and its implementation, and other relevant issues resulting from the biometric implementation. At the end of this paper, we present our preliminary results, our future work and conclusions.

The main problem on online assessments is to know who's there? (Hernández, Burlak and Lara, 2010). In this paper, we propose the use of biometrics, particularly the use fingerprint recognition on real time to authenticate students into the assessment system, and web cam monitoring during online assessments to deal with the well-known problem of: who is taking the exam? The contribution of this paper is the use of biometrics on online assessments as a new approach for remote identification on real time, we reviewed the literature on different related fields and we realized there are several proposals to deal with this problem, however none documented implementations of such technologies has been tested with flesh and bone students. Some of these proposals include separated point of views of IT, educational professionals or trainers with different perspectives, that problem was solved by constituting a multidisciplinary team work of professors, psychologists, statistics professionals and IT consultants.

5.2. Methodology

Virtual proctoring involves using biometric technology to monitor students at remote locations. For virtual proctoring, is recommended using a layered approach depending on critical maturity of the test. With high stakes tests, video monitoring and a biometric measure such as iris scanning may be used. For medium stakes tests, a single biometrics measure may be acceptable (BSU, 2006). Despite most of online assessments are located in the middle of both definitions, we consider the fact of high levels of cheating in remote assessments. In one hand, fingerprint recognition is a single biometric measure, the

cheapest, fastest, most convenient and most reliable way to identify someone. And the tendency, due to scale, easiness and the existing foundation, is that the use of fingerprint will only increase. Cars, cell phones, PDAs, personal computers and dozens of products and devices are using fingerprint recognition more and more (Griaule, 2015). One current trend is to incorporate fingerprint scanners into personal computers, laptops, and mice. In addition, computer networks and large databases can be secured using fingerprint technology. This is a hot topic of discussion since the phenomenon of the Internet and the development of Intra nets has spawned new digital technologies such as E-commerce and online services (ITEDU, 2006). Besides, users are more willing to use fingerprint recognition than iris recognition (AIDC, 2006), they believe is more secure for health. Unfortunately, fingerprint recognition is used to authenticate into systems, but then what? The student is free to use any media to commit cheat, to avoid that situation we considered the possibility to use web cams. Web cams are inexpensive and most of students are used to deal with them, they form part of their common tools to work and chat. Is for sure that some students will reject the possibility to be monitored, and percentages vary from country to country, but is our intention to measure this figure as a part of our research. Based on above exposed, we propose the mixed use of video monitoring, by means of web cams, and fingerprint recognition to provide a secure on-line assessment environment.

For our experiment, we selected a random sample of students ($n=102$) from the Jose Maria Morelos y Pavon High School, located in Temixco, Morelos, Mexico. We carried out two evaluations, a control evaluation (paper and pencil), and a second evaluation with our online assessment system with biometric recognition.

Tests design. Tests were designed by professors on August 5th and 6th 2007, one of them was implemented for the online assessment using our authoring tool. The tests consisted of 30 questions with similar level of complexity; we evaluated arithmetic, algebra, geometrics, and trigonometric subjects.

Setting up. Computers were prepared with our online assessment client software and biometric devices, network connectivity were tested.

The traditional test. The paper and pencil test was conducted on August 14th. 2007. This test can be consulted at <http://www.on-line-surveys.com/uaem/doctorado/>

Enrolment. Students were enrolled into the system by taking their left-hand index fingerprint on August 15th 2007. We took care of the students were identified by the system after their enrolment.

The online assessment with biometric recognition test. Was conducted on the Computers Network Laboratory located at the High School facilities from August 16th to August 17th 2007, each computer used in the experiment had attached a Microsoft Fingerprint Reader, a web cam, a broad band connection to our server as well as our proprietary client system. First of all, Students were instructed in how to use the system, we explained them that a web cam was monitoring their activities, later students authenticate by means of their fingerprint into our Server System and the computerized assessment started. The use of calculator and cellular phones was avoided.

The Survey. At the end of the exam we apply a survey to determine students' profile and perceptions about system's operation. We attached this information to demographics and results of test to perform data mining.

Statistical Analysis. Data was processed using descriptive analysis, using relative numbers and percentages using Ccount gnu free software.

5.3. Preliminary Results and Discussion

Considering the number of students enrolled ($n=102$) on this test with obtain a FAR of 99.99% and a FRR of 97.09%, only one student could not be recognized despite several trials, although we try enrolled her trying different fingers of her left hand we could not, she has tiny long fingers and the enrolment results were always the same. Her fingerprint template cannot be understood by the system due is confuse, her fingerprints seems like stains. Something related is registered in literature, Asiatic persons has similar problems to be identified by fingerprint readers (Michigan Org, 2015). We faced this problem by providing this student one user and a strong password. Finger print recognition was very well accepted but web cam monitoring was considered as measure that invades privacy. Students identified some ways to hack biometric system like staining the fingerprint reader or moving the web cam to focus a different place. In average, the online test grade was lesser than the traditional test grade, which means technologic platform influenced the student performance.

6. Conclusions

In this paper we have studied Data Mining (DM) as a tool to detect the student cheats in online assessments. Since the increasingly new technologies evolve, students are mastering cheating in online tests. This allows us to define this fact as cyber cheating due to the use of the Internet as the interaction

media. We also studied biometric recognition to solve the question: Who is there? In online assessments, in this sense fingerprint recognition was very well accepted, meanwhile web cam monitoring must be replaced by a non-disturbing device.

Acknowledgments

Part of this work was supported by CONACYT México project 169496.

References

- AIDC (2006). Automated Identification and Data Capture Web Site. Retrieved August, 2006, from <http://et.wcu.edu/aidc/>
- Bugai, Y., Burlak, G., Demchenko, A., Kuz'menko, N. (1997). *On Application of Computer Technology Testing In Educational Process*, In: Conference Role of Universities in the Future Information Society RUFIS'97, Prague.
- BSU (2006). Ball State University. Technology assessment reports on The use of Biometrics in education. Retrieved August, 2006, from <http://web.bsu.edu/dpmuller/biometrics/>
- CISCO (2015). Cisco Systems. Retrieved May 15th, 2015, from <http://www.cisco.com/>
- Carnegie (2005). Justice or Just Us?. Retrieved December 28th, 2005 from <http://www.carnegiefoundation.org/perspectives/sub.asp?key=245&subkey=577>
- FRST (2006). Foundation for Research Science and Technology. Retrieved January 12th, 2006, from http://www.frst.govt.nz/publications/tech-reports/downloads/index/Issue_29.pdf
- Griaule (2015). Biometrics FAQ. Retrieved May, 19th 2015, from http://www.griaule.com/page/en-us/faq_biometrics
- Hernández, J.A., Ochoa, A., Muñoz, J. and Burlak, G. (2006). Detecting cheats in online student assessments using Data Mining. In Dmin06, Las Vegas Nevada, USA.
- Hernández, J.A., Burlak, G. and Lara, B. (2010). Design and Implementation of an Advanced Security Remote Assessment System for Universities Using Data Mining. *Computación y Sistemas*, 13(4), 463-473.
- IMS GLOBAL Learning Consortium (2015). IMS Question & Test Interoperability Specification. Retrieved May 15th, 2015 from <http://www.imsglobal.org/question/index.html>
- ITEDU (2006). Biometrics. Retrieved August, 2006, from <http://et.wcu.edu/aidc/>
- McCabe, D. L., y Trevino, L. K. (1996). What we know about cheating in college: Longitudinal trends and recent developments. *Change*, 28(1), 28-33.
- McCabe, D. L., y Trevino, L. K. (1997). Individual and contextual influences on academic dishonesty: A multi-campus investigation. *Research in Higher Education*, 38(3), 379-396.
- Michigan Org (2015). Fingerprint Classification. Retrieved May 19th, 2015, from http://www.reachoutmichigan.org/funexperiments/agesubject/lessons/prints_ext.html
- Morris, T. A. (2005). Cheating and plagiarism in the information age. Retrieved December 30th, 2005, from http://terrymorris.net/tohe2004/CPIA_morris.pdf
- MSU Michigan State University (2006). Quizzes and Exams: Cheating on exams and Quizzes. Retrieved August, 2006, from http://teachvu.vu.msu.edu/public/pedagogy/assessment/index.php?page_num=3
- Rove, N.C. (2004). Cheating in Online Student Assessment: Beyond Plagiarism. *Online Journal of Distance Learning Administration*, 2(2). Retrieved May 19th, 2015, from: http://calhoun.nps.edu/bitstream/handle/10945/36015/Rowe_Cheating_in_Online_Student_Assessment.pdf?sequence=1
- Savvas, A. (2006). Online assessments and biometrics used in new immigration system. *Computer Weekly Section IT Management Politics and Law*, 10-10, 1/7p.
- Wasniowski, R. A. (2005). Using Data Fusion for biometric verification. *Transactions on Engineering, Computing and Technology*, 72-74.
- WEKA (2015). Weka 3: Data Mining Software in Java. Retrieved May, 15th, 2015, from <http://www.cs.waikato.ac.nz/ml/weka/>

DOES CONTACT REALLY MATTER? EXPLORING THE EFFECTS OF CONTACT ON PREJUDICES AND PROFESSIONAL REPRESENTATIONS

Mariane Gazaille¹, Karine Gauthier¹, Louis Gosselin² & Jean-Nil Boucher²

¹Department of Modern Languages and Translation, Université du Québec à Trois-Rivières (Canada)

²Cégep de l'Abitibi-Témiscamingue, Campus d'Amos (Canada)

Abstract

Knowing how to intervene with diverse clienteles is one of the competences that future professionals working and intervening with people should develop and master. Allport's contact hypothesis (1954) poses that the more one is in contact with stigmatized people, the more their prejudices tend to disappear. Yet, we do not know if contact works the same way with different kinds of preconceived ideas. The purpose of this paper is to provide insights on the influence of contact on prejudices and professional representations (PR). In order to do so, we explored the results of two studies we conducted on the impacts of the *Method of cognitive activation* (MCA), a three-step, cognitive-affective tool (Boucher & Gosselin, 2010) which, in accordance with Allport's theory, includes contact with stigmatized clienteles. To assess the effects of contact, we resorted to MCA to teach diversity to future teachers (study 1) and to future police officers (study 2). Pre and post results were respectively compared for both groups; variations in global results were studied afterwards to evaluate the effect of contact on PR and prejudice. Results show that contact does not have the same effect on PR as it does on prejudice.

Keywords: *Prejudice, professional representation, professionalizing training, contact theory, diversity.*

1. Introduction

Globalization, immigration, and mobility of workers have contributed to important changes in ethnic and cultural cohabitation worldwide. Changing the picture of communities' professionals work in and training future professionals to intervene in today's multicultural society has consequently become an important challenge for post-secondary professionalizing programs.

In Québec (Canada), the *Commission des droits de la personne et des droits de la jeunesse* (Human Rights and Youth Rights Commission, abbreviated to CDPDJ, 2011) recommends "that the *ministère de l'Éducation du Loisir et du Sport* (MELS), in collaboration with the university faculties concerned, ensure that the programs for each sector concerned contain antiracism and intercultural training, and that the students have acquired intercultural competency upon completion of their studies" (recommendation no. 4, CDPDJ, 2011, p. 50). Specifically targeted by this report were the public security and education sectors as well as the corresponding Police Technology and Teacher Training professionalizing programs. Yet, based on our teaching experience, many future teachers and future police officers cannot or do not want to recognize that they (may) hold preconceived ideas *vis-à-vis* some of the clienteles they will be intervening with.

Depending on their strength and depth, the preconceived ideas students have may cover a wide span of concepts ranging from beliefs to professional representations and prejudices. Allport's contact hypothesis (1954) poses that the more one is in contact with stigmatized people, the more their prejudices tend to disappear. Yet, if preparing future professionals to become efficient with diverse clienteles has become an important challenge for professionalizing programs, we do not know if all preconceived ideas can be addressed the same way. Prejudices and professional representations are two types of preconceived ideas that emerge not only from the self but also from the community or communities one belongs to. Does contact have the same influence on professional representations and prejudices?

2. Framework

Teaching otherness and diversity is not only an intellectual task or a question of acquiring knowledge; it is also about changing behaviors and attitudes. As a conceptual framework, it makes sense to rely on work done on prejudice and PR, Allport's theory of contact (1954), and transformative learning (Mezirow, 2001).

2.1. Prejudices and professional representations

"[P]rejudices and discriminatory behaviours are not innate but acquired, and their acquisition mainly takes places through the dominant public discourse" (van Dijk, 2005, p. 1, free translation). Prejudices include both a cognitive and an affective dimension. These two dimensions are not entirely independent (see Eagly & Chaiken, 1993) and they may interact with each other (see Mackie & Hamilton, 1993). Cognitive dimensions of prejudice are commonly represented as one's perceptions, judgments, and beliefs about a group (see Ostrom, Skowronski, & Nowak, 1994). In contrast, affective dimensions of prejudice are generally based on one's feelings and emotional responses to a group (see Smith, 1993). In accordance with this bipartite conceptualization of prejudice, some scholars suggest that a combination of cognitive and affective approaches to educational interventions is necessary (Herek, 1987; Sears, 1997).

Neither scientific nor common knowledge, professional representations (PR) are personal views of one's (future) profession and its reality, bearing upon prominent objects such as context, professional tasks, colleagues and themselves as well as interpersonal relationships (Blin, 1997). PR originate both from one's personal history and from the professional community's dominant discourse (*ibid.*, 1997). As such, PR stem from various encounters, exchanges, learning situations, observations, and tasks or actions performed. These experiences can be intellectual, emotional or both at the same time. Looking at their constituents, it would, therefore, be pertinent to resort to a combination of cognitive and affective approaches to work on PR.

2.2. Teaching otherness and diversity

On the one hand, Allport's contact hypothesis (1954) poses that, if the appropriate conditions are present, the more one gets in contact with victimized or stigmatized people, the more their prejudice tends to disappear. Moreover, "[r]ecent studies suggest that Contact Theory is successful in bringing about more positive attitudes towards others [and] reducing prejudice (Center for Social Relations, 2013). For example, the contact hypothesis has proven to be effective in predicting more favourable attitudes and alleviating prejudice directed toward homosexuals (Herek, 1987; Herek & Glunt's, 1993) and Muslims (Novotny & Polonsky; 2011; Savelkoul, Scheepers, Tolsma, & Hagendoorn, 2011). Other researchers have also found that perception and attitude toward outgroup members can significantly be enhanced following contact with a single outgroup member (Wolsko, Park, Judd, & Bachelor, 2003).

On the other hand, the Transformational Learning Theory (Mezirow, 1991, 2000) postulates that transformational learning occurs through critical self-reflection and that for new schemas or ways of thinking to emerge, it is necessary for people to assess or reassess their values, beliefs, and assumptions. A transformation in the way one sees and understands the world will likely occur in response to an externally imposed disorienting dilemma (*ibid.*, 1991). These disorienting dilemmas can be critical life events, new life experiences, eye-opening discussions, efforts to know or understand a different culture, etc. Yet, transformative learning cannot be achieved by simply making learners aware or by prompting them to experience a disorienting dilemma: it is necessary to involve them by having them critically reflect on their experience and critique their established ways of thinking and behaving.

In sum, both the cognitive and the affective dimensions of preconceived ideas should be addressed for a change to be observed in one's thinking and attitude. In order to teach diversity and openness to otherness, educational professionalizing training should comprise a set of different strategies and tasks articulated to work on students' preconceived ideas and feelings, to prompt contact with stigmatized clienteles, as well as to exploit critical self-reflection for a change in one's perception and understanding of others.

3. Methodology

In order to study the impact of contact on PR and prejudices, we explore the results of two studies done on the impacts of the Method of Cognitive Activation (MCA), a three-step, cognitive-affective tool (Boucher & Gosselin, 2010). In line with the theory of contact and the principles of active learning, MCA works from the emergence of one's preconceived ideas to cognitively deconstruct and emotionally challenge these ideas through contacts with targeted stigmatized or victimized clienteles. We relied on MCA to teach diversity to future teachers (study 1) and to future

police officers (study 2). The two studies reported here hypothesized that future professionals held preconceived ideas – known and unknown to them – about different clienteles they would eventually interact with in their future career, and that these ideas would change after encounters with these clienteles. Due to the smaller number of participants in study 1, an open-ended pre and post questionnaire was used to survey student teachers' PR; a pre and post Q-sort questionnaire on prejudice was administered to the future police officers. Pre and post results were respectively compared for both groups; variations in global results were studied afterwards to evaluate the effect of contact on PR and prejudice.

3.1. Study 1 – Two variations on the Method of cognitive activation of prejudice

In order to better prepare second language (L2) teachers, the *Ministère des Loisirs et du Sport* (MELS) requires that Québec universities train L2 student teachers (ST) to be ready to teach different clienteles such as adults, special needs students, very young language learners, intensive English groups, etc. Since teacher training has to be long enough to produce positive and favourable results (Garet, Porter, Desimone, Birman, & Yoon, 2001) – which is not easy to do in already well-loaded teacher training programs – we experimented the two following variations of MCA (Boucher & Gosselin, 2010) to teach L2 ST about these clienteles. In Variation 1, ST first answered an open-ended questionnaire, which worked as an exercise for the emergence of ST's PR. Then, they academically learned about the different clienteles through readings, a needs analysis task, and in-class discussions. At the end of the semester, ST retook the open-ended questionnaire, which was then used as a cognitive reconstruction task. That is, Variation 1 exclusively taught ST bearing upon cognitive strategies. In Variation 2, ST would answer the same questionnaires and academically study the targeted L2 clienteles (see Variation 1 above) and undergo a brief (one-hour) teaching experience with each of them. That is, Variation 2 taught ST resorting to cognitive strategies as well as resorting to mandatory contact with the studied L2 clienteles, which includes a relational component and, consequently, an emotional dimension. Except for the one-hour teaching experience in Variation 2, ST from both groups were taught exactly the same content, using the same material and teaching methodology, by the same teacher. The emergence and cognitive reconstruction open-ended exercises worked as pre and post questionnaires for study 1. They were administered to 21 ST registered in the Variations on Normal Classroom Teaching¹ course during the 2012 and 2013 fall semesters. Changes in ST's PR was operationalized in terms of feelings and attitude toward teaching two less frequently taught L2 clienteles: very young L2 learners and adults. A qualitative evaluation of the variations in PR was performed and results were compared in terms of ST's professional representations *vis-à-vis* the two L2 clienteles studied.

3.2. Study 2

At the cégep² level, the Police Technology Program identifies two competencies that must be developed for a professional intervention with stigmatized, victimized, or frequently prejudiced clienteles: 1) competency 009B – *To interact with distinctive clienteles*, and 2) competency 009H – *To interact with clienteles belonging to different cultural and ethnic communities* (Gouvernement du Québec, 2005). The research question for study 2 was the following: “Can the *Method of cognitive activation* help Police Technology Programs teach diversity and otherness?” As compared to how the witness groups were taught, MCA distinguished itself by its systematic, didactical sequence (prejudice emergence – emotional deactivation – cognitive reconstruction) as well as by the number of mandatory contacts with clienteles studied (students in the experimental group met about three times more people from more varied and different clienteles and communities) (Gazaille, Boucher, & Gosselin, 2014). A pre and post questionnaire on prejudice was administered to 146 future police officers ($n_{\text{experimental}} = 29$ and $n_{\text{witness}} = 117$) from three different establishments. The questionnaire was inspired from Yang and Montgomery's Q study of attitudes toward diversity (2013) and comprised a total of 50 questions. Pre-test and post-test means were compared to determine the impact of the method on participants' prejudices.

¹*Variations on Normal Classroom Teaching* is a compulsory intensive course in the Bachelor of Second Language Teaching offered at Université du Québec à Trois-Rivières (Québec, Canada). Its purpose “is to introduce students to teaching English as second or a foreign language in situations other than regular classroom situations. [...] such as teaching ESL to children with special needs, English for Special Purposes (ESP), adult education, immersion” (UQTR, 2014).

²CEGEP is an acronym for Collège d'enseignement général et professionnel, known officially in English as a “General and Vocational College”. It refers to the public post-secondary education collegiate institutions exclusive to the education system in the province of Quebec in Canada. <http://en.wikipedia.org/wiki/Cégep>
CEGEPs offer two-year pre-university and three-year technical programs. College education normally follows the fifth year of the secondary cycle.

4. Findings

The following tables report the effects of contact with distinctive clienteles and varied communities on future police officers' (table 1) and ST's (table 2) preconceived ideas.

Table 1. Effects of the Method of cognitive activation on future police officers' prejudices

Group	Pre-post average differences	p
Experimental	-0,15	.03
Witness	+0,19	.001

Table 1 illustrates that future police officers reported less prejudice toward distinctive clienteles and different ethnic communities while witness groups reported holding more. The differences in pre/post averages were significant for both groups. Both experimental and witness groups underwent academic study or cognitive-oriented learning of the clienteles studied in class, a major difference in the teaching strategies used lying in the greater number and variety of contacts with outgroup members encountered by students in the MCA group. Thus, even though the MCA students were taught following a more systematic didactical sequence, it can be put forward that contact contributed to the decrease observed in the experimental group's level prejudice.

Table 2. Effects of the "with contact" and the "with no contact" variations of the Method of cognitive activation on future second language teachers' self-reported feelings toward teaching two less frequently taught L2 clienteles

Clienteles	Very young L2 learners			Adult Education (ESP)		
	Increase	No effects	Decrease	Increase	No effects	Decrease
With contact (n = 7) (/14)	2 (4)	2 (4)	3 (6)	2 (4)	3 (6)	2 (4)
No contact (n = 14)	8	2	4	5	2	5

Both Variation 1 and Variation 2 groups reported gaining knowledge about the two clienteles studied. Yet, group 2 ST, i.e. those who experienced contact with the L2 clienteles studied, proportionally reported feeling a little less comfortable to teach these clienteles. It is worth noting, though, that a closer look at these results had revealed that ST who had reported being more positive toward a given L2 clientele at the beginning of the semester also expressed more positive feelings and attitude toward it after the one-hour teaching experience (Gazaille, Boucher, & Gosselin, 2014). The same tendency was observed with ST who had expressed negative feelings toward teaching a given L2 clientele. Indeed, ST who would have expressed negative feelings toward teaching an L2 clientele at the beginning of the semester would report even more negative feelings toward the same clientele (*ibid.*, 2014).

In sum, our results lead us to suggest that contact does not have the same effect on PR as it does on prejudice. Indeed, contrary to results with future police officers, it looks as if contact would reinforce some ST's professional representations, positive or negative.

5. Conclusions

The purpose of this paper was to provide insights on the influence of contact on prejudices and PR and to show the first results of an educational tool, MCA, aimed to improve the teaching-learning of diversity and otherness. Results support that contact has an influence on both prejudice and PR. Yet, a one-hour long interactive encounter with one outgroup member seems to have had more effects on prejudice than a one-hour long professional intervention with a group. In other words, the effect of contact on prejudices and on PR would follow a different pattern of action. *Post hoc* comparison of the two studies referred herein comprises a number of limits and, consequently, our results need to be interpreted with care. Yet, in line with our results, it can be advanced that MCA shows potential for working on prejudice in post-secondary professionalizing programs. It can also be suggested that professionalizing training programs adapt their teaching strategies and activities depending on the type of preconceived ideas they address.

References

- Allport, G. W. (1954). *The nature of prejudice*. Cambridge, MA: Perseus Books
- Boucher, J.-N., & Gosselin, L. (2010, June). *Agir dans le respect des différences. La méthode d'activation cognitive*. Paper presented at the 30^e Colloque de l'AQPC, Savoirs et pratiques : un tandem gagnant, Sherbrooke, Canada.
- CDPDJ (2011). *Racial Profiling and Systemic Discrimination of Racialized Youth. Report on the Consultation on Racial Profiling and its Consequences*. Québec: Commission des droits de la personne et des droits de la jeunesse.
- Contact Theory. (n.d.). Retrieved February 21, 2014, from Coventry University, Center for Social Relation Web site: <http://www.cohesioninstitute.org.uk/Resources/Toolkits/InterculturalDialogue/ConceptualFramework/LiteratureReview/ContactTheory>
- Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., & Suk Yoon, K. (2001). What Makes Professional Development Effective? Results from a National Sample of Teachers. *American Educational Research Journal*, 38(4), 915-945
- Gazaille, M., Boucher, J.-N., & Gosselin, L. (2014, June). *Teaching Otherness in Postsecondary Professionalizing Programs: A Pilot Study in Police Technology*. Paper presented at the 2014 WEI International Multidisciplinary Academic Conference, Budapest, Hungary. Retrieved from <http://www.west-eastinstitute.com/wp-content/uploads/2014/07/Mariane-Gazaille.pdf>
- Herek, G. M. (1987). The instrumentality of attitudes: Toward a neofunctional theory. *Journal of Social Issues*, 42, 99-114.
- Herek, G. M., & Glunt, E. K. (1993). Interpersonal contact and heterosexuals' attitudes toward gay men: Results from a national survey. *Journal of Sex Research*, 30, 239-244.
- Mezirow, J. (1991). *Transformative dimensions of adult learning*. San Francisco, CA: Jossey-Bass.
- Mezirow, J. (2000). Learning to think like an adult: Core concepts of transformational learning. In J. Mezirow and Associates (Eds.), *Learning as transformation: Critical perspectives on a theory in progress* (pp. 3-34). San Francisco, CA: Jossey-Bass.
- Novotny, J., & Polonsky, F. (2011). The Level of Knowledge about Islam and Perception of Islam among Czech and Slovak University Students: does Ignorance Determine Subjective Attitudes? *Sociologia*, 43, 6, 674-696.
- Rimm-Kaufman, S. E., Storm, M. D., Sawyer, B. E., Pianta, R. C., & LaParo, K. M. (2006). The Teacher Belief Q-Sort: A measure of teachers' priorities in relation to disciplinary practices, teaching practices, and beliefs about children. *Journal of School Psychology*, 44, 141-165
- Savelkoul, M., Scheepers, P., Tolsma, J., and Hagendoorn, L. (2011). Anti-Muslim Attitudes in The Netherlands: Tests of Contradictory Hypotheses Derived from Ethnic Competition Theory and Intergroup Contact Theory. *European Sociological Review*, 27(6), 741-758.
- Sears, J. (1997). Thinking critically/intervening effectively about heterosexism and homophobia: A twenty-five-year research retrospective. In J. Sears & W. Williams (Eds.), *Overcoming heterosexism and homophobia: Strategies that work* (pp. 13-48). New York: Columbia University Press.
- Université du Québec à Trois-Rivières. (2014). Répertoire des cours. Retrieved February 17, 2015, from https://oraprdnt.uqtr.quebec.ca/pls/public/couw001?owa_sigle=PDG1037

DECONSTRUCTION, CO-CONSTRUCTION AND RECONSTRUCTION: CREATING AN INTEGRATED TEACHER EDUCATION PROGRAM

Angela Ward

College of Education, Zayed University (UAE)

Abstract

Preparing teacher candidates to teach in tomorrow's learner-centered classrooms is a challenge for teacher educators. Balancing coursework and practicums is another challenge. This paper describes an evolving university teacher-education program in the United Arab Emirates that seeks to face these challenges. Using an action research model, faculty developed the 'Semester 7 Block Program' that embodies the learner-centered philosophy and pedagogy of an integrated curriculum. It provides an experience for teacher candidates whereby they experience learning within an integrated curriculum that supports learner-centered classrooms. To enable this to happen within the constraints of a university schedule of courses, faculty deconstructed the university courses and created an integrated program within a theoretical framework that integrates learning outcomes, assessments, and sustained practicum experiences in schools. The program encourages and supports the co-construction of knowledge and professional practice in a learning community, with strong connections between coursework, assessment tasks and practicum experiences. Reconstruction at the end of the program means that grades can be assigned to the previously deconstructed courses, and subsequently appear on the candidates' transcripts. The program has developed over five cycles/semesters of the action research model. Qualitative data from participating teacher candidates, mentors, school principals, teachers, and faculty include meeting minutes, observations, discussion notes, feedback forms, emails, narratives, and anecdotal information. These data have been an integral part of the research's ongoing and cyclical reflection and planning process. The strengths, challenges, limitations, constraints, and the ongoing story of the program are reflected on during, and evaluated at the end of, each cycle. The ongoing data enable the program to grow and respond to candidates' learning, emotional, and professional needs; they feel confident and prepared to proceed to their internship semester, and on into their own classrooms.

Keywords: *teacher education, integrated curriculum, action research*

PROCESS OF CONTINUED EDUCATION IN THE PROGRAM SCHOOL MANAGERS OF PUBLIC BASIC EDUCATION

**Rita Márcia Andrade Vaz de Mello, Leililene Antunes Soares, José Márcio Silva Barbosa
& Maria das Graças Soares Floresta**
Universidade Federal de Viçosa (Brasil)

Abstract

This study aimed to understand the importance and meaning of the education in the National Program School Managers of Public Basic Education through the participant teachers' perception and reflection of themselves on their practice. We tried to understand how this formation is manifested during and after the course, in the practice of the teachers/managers, but especially as these teachers participate, through their reflection on their educational practice as agents acting within their classrooms, their school and their community. This field research was carried out with five tutors and ten course participant teachers of the Program and engaged in the teaching profession, particularly the school management of public schools in cities of Minas Gerais-MG, registered in the Universidade Federal de Viçosa, using as instruments semi-structured interviews and documentary analysis. We realize that the course participants and the tutors highlighted that the course provided the arise of new looks over their teaching practice. The knowledge and the education process acquired and reworked through the course seems to give these professionals a keener critical sense, offering intellectual instruments useful for the comprehension and interpretation of the most complex situations, by the link between the intellectual knowledge and the day-to-day practice in the exercise of teaching at public schools. The reality goes with the objective of allowing these people emancipation, not only equip them technically to "pass on" contents and that involves rethinking their actions in class, their professional posture, their own school. We conclude that the participant teachers have done and still do an exercise of reflection on their formation and on their practice in the classroom, and in the pedagogical actions at school, in view of what was proposed by the course, the practical development of the triad action-reflection-action.

Keywords: *teachers education; National Program School Managers; teaching practice; reflective teacher.*

1. Introduction

This study the formation and pedagogical practice of teachers who underwent a course of Post-graduation *Lato Sensu* offered as distance education, in the Universidade Federal Viçosa (UFV). This course, offered as part of the National Program School Managers of Public Basic Education, developed by the Ministry of Education in partnership with the Federal Universities, intended for teachers who work as school managers in the early years of primary education in public schools in Brazil.

Specifically, what was intended in this study was to discuss the education of teachers under the National Program School Managers in order to identify the perception of participant teachers about the influence of this course in their teaching during the course and after its conclusion. This work was developed through a qualitative approach.

We sought to verify how the participation in a course of in-service training, specifically in this Program, involved and still involves reflections on the teaching practice of the participant teachers, through an interview with ten course participants teachers and five tutors belonging to the Universidade Federal de Viçosa.

The school manager stands out in the promotion of public school, but requires the exercise of multiple skills and various matrices, because the educational systems and educational institutions are living and dynamic organisms characterized by a network of relationships among all elements that act on them.

2. Theoretical Framework

Teacher education in Brazil was linked to several conceptual proposals that vary according to the educational policy of its time, ranging from educational technicality, the market logic to the state neglect that left the teachers formation at the mercy of the private sector without an effective social control, whether by government, or by the society, allowing the formation of basic education professionals to be of a minimum quality condition which has not linked the teacher education to the investigative nature of the research and development in education (CIOFFI; BUENO, 2011).

In the formative context, it is worth highlighting the professional contentment, which is a multifaceted concept that embraces personal, vocational and contextual aspects regarding the reality of work. "The teacher's role built throughout the history of mankind is present in the learning records of each of us under the most different guises" (SEIDMANN et al, 2012, p. 43).

The pursuit of continuing education under the perspective of the post-graduate distance courses, according to Candeias (2013) by the concrete fact that we will have a growing contingent of teachers who will make the choice of a formation linked to a post-graduation *Lato Sensu* course, something that is not decontextualised from the reality of basic education, which is known as a constant and seems to "have come to stay", imposing the universities and especially the Graduate Programs throughout Brazil the debate about its social role.

2.1. Reflections of the pedagogical practice of participant teachers in the managers school

Understanding the teacher as a reflective professional, the context is fundamental to the formation process. And this reflection must be made by sharing with other teachers, by exchange of experiences, in the look on the action itself as a teacher, in dialogue with the theories, methods and standards of their field. Viewed from this perspective continuing education advances in the perspective of initial and continuing education, where the school-space context and teacher's role become privileged locus of such formation.

Based on these principles, we now analyze the data obtained from this research that gave voice to tutors and participant teachers which aimed to identify whether they established relations between the obtained education and everyday teaching practice.

In addition to changes in teaching practices, the course also led some participants to study more, seeking new opportunities of continued education, as highlighted by the tutor:

We realize the reorientation of practice of course participants, both in monitoring their memorials, and in the reorientation of their practices. We already have several teacher students doing post-graduate courses, i.e. a gain beyond higher education and this is an important mark of development (Tutor "Jasmine").

The course participants emphasized that there was freedom of opinion and dialogue among course participants, tutors and project's coordinators, as they were free to provide feedback and were heard when they did not agree with some work methodology.

We questioned the course participants about how was the formation obtained in the Program and the analyzes made by them highlighted advances in their practices and changes in attitude in their educational work:

I changed, grew after having completed the Program School Managers, my students tell me that I changed and I realize that in the classroom, and in my own life, an advance that I sought and found in the Project, in the experience with the fellow students, tutors and in the exchange of experiences. I changed in my house, and now I have learned to look for new ways to help students advance when they cannot learn in a specific way (Course participant "Bromélia").

As can be observed in the speech of the student "Bromélia", changes occurred not only in the classroom, but in her life as a whole, affecting also the domestic space.

In the case of the evaluation process they went through in the Program School Managers, the course participants reported that, besides having been observed during the course, they made several tests and papers. Said that despite the new methodology of work, because it is a distance learning course, were being evaluated in a comprehensive and integrated manner:

With the tutor in the classroom observing the teacher's lesson, seeing how he put into practice what they had studied in the guides. This happened once during the semester. So the teacher would have the notes in accordance with

the attitudes, procedures, plans, everything which would take the student to have a significant learning (Course participant "Rosa").

The student "Margarida", in the following quote, brings a critique of a certain type of assessment that prioritizes memorization, which is already ready, made by people not involved in that group:

The assessment worked for the teacher, for the student and the institution, where all are evaluated in the teaching-learning process and this assessment should be continuous. But the problems were more personal and yet we were heard and respected, the biggest problems we observed were in some tests per module, the ones that came from Belo Horizonte for us to do like an entrance exam. Some questions were of pure memorization, that we did not like, but over time has improved, the course was therefore constructed from the development (Course participant "Margarida").

This report shows the ability of the course participant to criticize her own education process, reflect on the type of evaluation used, which leads necessarily to a reflection on the practice itself, leading to changes in how these course participants analyze and act on their evaluative practices as teachers.

[Evaluate] Is diagnose what the student has learned or did not learn while you could teach or not and that this evaluation should be done, because that's how we know our students, but there are several ways to evaluate and teachers must use all (Course participant "Hortênsia").

The ability of the teacher to reflect on their actions takes him to redraw a new knowledge, a new strategy from the challenge is sometimes presented. The proposal of the of National Program of School Managers realizes the teacher as a reflective professional able to think about his practice and through the studies acquired combined with his experience, redesign new knowledge, new know-how and new practices.

The data collected, it can be noticed that for the investigated group, the formation received in the *Lato Sensu* course sense of the National Program of School Managers offered at UFV favored a link between the theoretical principles studied and the pedagogical practices developed by these teachers.

3. Conclusion

The National Program School Managers of Basic Education take as base the teaching paradigm or the practical rationality paradigm, because it strengthens the importance of the reflective teacher, whose main axis is the redefinition of teacher professional identity. This paradigm is opposed to the paradigm of technical rationality and values the pedagogical experience and practice, considering the knowledge constituted by the people, their knowledge in relation to the teaching practice experienced.

We realized, in the research carried out here, that course participants and tutors emphasize that the course provided the arise of new perspectives on their teaching practices. The knowledge and the formation process acquired and reworked through the course seem to provide these teachers with a sharper critical sense, offering them useful intellectual tools to understand and interpret the most complex situations in which a link between intellectual knowledge and the everyday practice in the teaching profession in public schools. The reality walks in order to allow the emancipation of these people and not just equip them technically to "pass on" contents and this involves rethinking their actions in the classroom, their professional behavior, their own school.

The most important finding was the need of a practice whereby, according to SHÖN (2000, p.30), action and reflection must go together, contributing to the dialogue and overcoming "practical situations that are unique, uncertain and conflicting ". Certainly, action and reflection-in-action are able to give real support to the changes in the educational, political and social fields.

Based on the positive experience they had with the offering of the first class, we certify that the University cannot do without its social function and its production of knowledge and that this partnership between several institutions, effected in the *Lato Sensu* course not only helps in the formation of the course participants, but it has been a meaningful experience for all involved, promoting changes in teaching practices at all levels, highlighting the ever pressing need to link theory and practice in order to build an inclusive and quality education.

References

- Bardin, Laurence. *Análise de conteúdo*. Tradução de Luís Antero Reto e Augusto Pinheiro. Lisboa: Edições 70, 1977.
- Brasil. Ministério da Educação. Lei nº 9.394 de 20 de dezembro de 1996. Estabelece as diretrizes e bases da Educação Nacional. *Diário Oficial da República Federativa do Brasil*, 1996.
- Candeias, C. N. B. Formação de professores, tecnologias da informação e comunicação e pós-graduação: uma possível articulação. p. 372-390. *Educação em perspectiva*, v.4, n.2, jul./dez.2013.
- Cioffi, L. C.; Bueno, J. L. P. *Análise das bases legais que fundamentam a política de formação de professores no Brasil*. ANPAE, 26-30 abr. 2011.
- Dominicé, P. *A história de vida como um processo de formação*. 1990.
- Gatti, B. A.; Sá Barreto, E. S. *Professores do Brasil: impasses e desafios*. Brasília: UNESCO, 294 p. 2009.
- Gómez, A. P. “O pensamento prático do professor – a formação do professor como profissional reflexivo” em Nóvoa, A. (coord.). *Os professores e sua formação*, p. 95-114. Lisboa: Publicações Dom Quixote, 1992.
- Guimarães, V. S. *Formação de professores: saberes, identidade e profissão*. Campinas, SP: Papirus, 2004.
- Lück, Heloísa. *Perspectivas da Gestão Escolar e Implicações quanto à Formação de seus Gestores*. Em aberto, Brasília, v. 17, n. 72, p. 11-33, fev./jun. 2000.
- Minayo, M. C. S. *Ciência, técnica e arte: o desafio da pesquisa social*. In: MINAYO, M. C. S. (Org.). *Pesquisa social: teoria, método e criatividade*. 23. ed. Petrópolis: Vozes, 2004.
- Moreira, D. A. *Entrevistas e estudo de casos*. Disponível em: <http://www.fecap.br/Moreira/textos_metodologia>. 2002. Acesso em: 15 mar. 2010.
- Nóvoa, A. (Coord). *Os professores e sua formação*. Lisboa, Publicações Dom Quixote, 1992.
- Perrenoud, P. *Práticas Pedagógicas, profissão docente e formação. Perspectivas sociológicas*. Lisboa: Nova Enciclopédia, 1993.
- Pimenta, S. G.; Ghedin, E. (Org.). *Professor reflexivo no Brasil: gênese e crítica de um conceito*. 3ª Edição. São Paulo: Cortez Editora, 2005.
- Puglisi, M. L.; Franco, B. *Análise de conteúdo*. 2 ed. Brasília: Liber Livro Editora, 2005.
- Schön, D. “A. Formar professores como profissionais reflexivos”. In: NÓVOA, A. (org.). *Os professores e sua formação*. Lisboa: Dom Quixote, 1992.
- Schön, D. *Educando o Profissional Reflexivo*. Porto Alegre: Editora Artmed, 2000.
- Seidmann, S. et al. *Construção identitária e prática docente: reflexões a partir da teoria das representações sociais*. In: Placco, V. M. N. S; Bôas, L. P. S. V; Souza, C. P. (orgs.). *Representações sociais: diálogos com a educação*. Curitiba: Champagnat; São Paulo: Fundação Carlos Chagas, 2012, p. 43-56.
- Vaz De Mello, R.M.A. *et al.* “A Didática de Ensino Superior e a sua função Pedagógica nos Cursos de Pós-Graduação”. In: Braúna, R. C. A.; Ferenc, A. V. F. (org.) *Trilhas da Docência: Saberes, identidades e desenvolvimento profissional*. São Paulo: IGLU, 2008.
- Vaz De Mello, R.M.A. Soares, L. A. *Intercensões entre papel, atribuição, mediação e prática pedagógica dos tutores presenciais na formação continuada de professores a distância*. 1ª ed. Curitiba, PR: CRV, 2013.

"FATHERHOOD IN THE CLASSROOM": WHEN LIFE AS A FATHER MEETS THE TEACHING PROFESSION

Ina Ben-Uri, Ph.D

School of Education, The Hebrew University of Jerusalem (Israel)

Abstract

The current paper deals with male-teachers' perceptions of the meaning of being a father on the teaching practice. The research is based on the reports of 43 Israeli teachers-fathers, using semi-structured interviews. The participants' age ranges between the early 30's up to 60 years old. The age of their children ranges between a few months to adult age. The main findings indicate that the emphasized interviewees' perception sees fatherhood and teaching as an opportunity to mutual enrichment. The study presents 4 major ways these male-teachers see the use of their parenthood experience in their practice as teachers: 1. Recognizing different characteristics of their students 2. Accomplishing a better empathy to the students 3. Implementing parental personal-interaction experience with the students 4. Understanding the students'-parents point-of-view. Implication for teachers'-training and counseling are discussed.

Keywords: *Male-teachers, teacher-father, fatherhood, work-family relations, teacher-student relations.*

1. Introduction

Parenthood and professional-occupation are considered to be two of the most central rolls in life. Parenthood among teachers is particularly interesting: review of the missions of the two practices, reveals a resemblance between them (responsibility for socialization processes, developmental aspects, roll-modeling and caring for the well-being of the child). Due to the intersection of these missions, it is intriguing to understand the meaning of their existence in the same person: a teacher who is a parent. Despite of the potential interest in observing such two crucial social-rolls together; there are not many research-papers on the subject. The studies who dealt with the issue, mostly focused on female-teachers (Cinamon & Rich, 2005; James, 2010; Sikes, 1997; Thomson & Kehily, 2011; White, 2008), apparently because of the social-identification of the teaching profession with the "natural" feminine tendency to care and nurture (Gieves, 1989; Sikes, 1997; Winnicot, 1964). Nevertheless, it is the fatherhood practice that is being increasingly addressed by a growing number of studies. Research in this area in the past twenty years has been influenced by the transformation in the practice of fatherhood among increasing numbers of men in the Western world. This phenomenon, which has been called the "new fatherhood", is characterized by the desire expressed by fathers to be significantly involved in raising their children (Beaupre et al., 2010; Carpenter, 2002; Coakley, 2006; Doucet, 2006; Griggs, 2012). From this point of view, the special characteristics of fathers who are teachers provide a unique case-study. It is interesting to understand the way these men perceive the links between their similar tasks in these two spheres. Do they find this resemblance helpful in coping with the missions of the two rolls or is it rather confusing and laborious?

2. Sample and Method

The sample in this research included 43 fathers who teach in junior high and high schools and live in the central region of Israel. The ages of respondents ranged from 28 to 64 years, with an average of 46.8 years. The average number of children per respondent was 2.1. The teaching disciplines of the participants were varied; two-thirds of them had additional positions within the same school (professional coordinator, assistant to the principal, etc.). More than a third of the respondents began teaching after having left a different profession; most of them are military retirees.

The methodology chosen for the present study is qualitative and the research tool used is in-depth, semi-structured interviews. In the interviews, the participants were asked about their perceptions of their professional lives, their perceptions of being fathers and possible interfaces between the two

areas. The interviews were recorded, transcribed and analyzed according to content-analysis techniques. After the initial reading of each interview, recurring themes were identified, defining the main themes of the study. The next step was to classify the various attitudes of respondents to the various themes. Once these attitudes were grouped and filtered, the categories that defined each theme were set. The final stage of research included a thematic analysis conducted as a comparison between the different aspects of the data to find links, similarities or differences between them.

3. Results

The main findings indicate that the emphasized interviewees' perception sees fatherhood and teaching as an opportunity to mutual enrichment. In the perception of the participants, the parental experience contributes to their professional competence as teachers. The results are presented according to the 4 major ways these male-teachers see the meaning of being a father to their practice as teachers:

3.1. Recognizing different characteristics of the students

In the eyes of the participants, one of the meanings of being a teacher who is a father is an increased sensitivity to diversity of needs among the students. From this point-of-view, understanding the various characteristics (difficulties, different stages of development et cetera) of their own children helped them recognize those of their students.

"I see in every child a whole world. Every each and one of them have its own needs and requests, every one of my students is like my-own child and I feel as attentive to my students as I am attentive to the different needs of my children."

"I am extremely sensitive to children with ADHD, much more than others...I have an experience with the issue. I am much more flexible than other teachers because of my son. You will never hear me shout, I will just tell the student to take a break of two minutes outside the classroom...I look at my son and I wonder how many times a teacher said a kind word to him..."

3.2. Accomplishing a better empathy to the students

According to the interviewees, their fatherhood emotional-experience helped them to establish a better emotional understanding (empathy) of their students. This empathy was frequently used to make professional decisions (academic, organizational and disciplinary).

"I think that my private children made me softer...there is an interaction between my fatherhood and being a teacher. I am different now. I make a special effort, I am sitting with a student who is the same age my daughter is right now and I see that she is having the same problems with her math-exam, I see how frustrated she is...exactly like my daughter, so I could feel the need to help her once again"

3.3. Implementing parental personal-interaction experience with the students

Fatherhood was often described as an opportunity for a practice-field for personal-interaction between adults and children. This gathered experience was used in professional situations.

"I find myself many times during the day talking to students that I feel they need it...I don't have to do it, but I can see that something is wrong and I come to them and ask them about it. I became much more sensitive and I have an experience in doing that. I think that I do it more because I have a son at home. I do not remember I did things like that before I became a father..."

3.4. Understanding the students'-parents point-of-view

Another dominant voice expressed by the teachers-fathers was the way they feel that their parental experience contributed to their ability to understand their students' parents point-of-view. Sometimes they felt that due to that experience, they can advice the parents how to act with their children.

"When I interact with parents, I feel that I can see their point of view, I guess I can see myself in their position... I made a call to a mother of a student who had some discipline problems a while ago, and now she had started to get better, so I made that call, and I cannot forget how surprised and happy she was. I was very glad for her and I think that it is because of the experience I had with my own son this year. The same time I called that mom, I had the problems with my son at school and than his teacher called us and said that he is much better now. So I thought I may do the same..."

4. Conclusion

An over-roll view at the presented results, reveals an emphasized voice. The meaning of fatherhood practices in the teaching-profession has been described as a “*parental compass*”. This compass is guiding teacher-parents and helping them demonstrate empathy for their students’ difficulties and needs, assisting them in making professional decisions and serving as a basis for better understanding their students’ parents. These findings regarding the contribution of fatherhood to the practice of teaching join the existing literature describing the parenting experience as having a significant emotional impact and being a practical catalyst for personal development in the process of maturing and the consolidation of the various areas of a person’s life (Lupton & Barclay, 1997; Palkovitz, 2007; Sikes, 1997). This thought can be taken into consideration in teachers'-training and educational-counseling processes. Empathy is mentioned as an important component in creating a positive interpersonal-communication between teachers and students (Cooper, 2010; Fresko, Reich, Sjöo & Lonroth, 2013; Stoilescu & Carapanait, 2011). Empathy is also described as relevant to demonstration of coping skills among teachers who have students with diverse needs (Bennett, 2008; Mowat, 2010; Washburn, 2008). Fresko et al. (2013) argue that consistent narrative-building activities, can contribute to improving empathy and enhancing communication skills for teachers. Parenthood is definitely a crucial component in a persons' narrative. From this perspective, it seems that turning into the teachers' or trinees' "parental compass" can be important when he or she needs to gain empathy towards their students' situation or needs. This training of professional intercommunication skills can be made by work-shop classes during the training processes for teachers. The current study also demonstrates the way the "parental compass" helps teachers to better understand their studants' parents. School-parents relations are widely mentioned in the last decade as a challenging practice for both sides (Addi-Racchah & Ainhoren, 2009; Kikas, Poikonen, Kontoniemi, Lyyra, Lerkkanen, Niilo, 2011; Walsh, Harel-Fisch & Fogel-Grinvald, 2010; Yildiz, Yildirim, Ates & Rasinski, 2012). Hiatt-Michael (2006) proposed recommendations for future directions in development for family-school-community involvement programs. Two of them focus on explicitly incorporating family-community involvement knowledge, skills, and values into pre-service teacher licensing programs. The "parental compass" can be used as a professional tool to establish a better communication between teachers and parents.

References

- Addi-Racchah, A.& Ainhoren, R. (2009). School Governance and Teachers' Attitudes to Parents' Involvement in Schools. *Teaching & Teacher Education*, 25(6), 805-813.
- Beaupre, p., Dryburgh, H., & Wendt, M., (2010). Making fathers "count", *Canadian Social Trends*, 90, 25-33.
- Bennett, M. M. (2008). Understanding the Students We Teach: Poverty in the Classroom. *Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 2008, Vol.81 (6), p.251-256.
- Carpenter, B. (2002). Inside the portrait of family: The importance of fatherhood, *Early child development and care*, 172 (2), 195-202.
- Cinamon, R. G. & Rich, Y. (2005B). Work-family conflict among female teachers, *Teaching and Teacher Education*, 21, 365-378.
- Coakley, J. (2006). The good father: Parental expectations and youth sports, *Leisure Studies*, 25 (2) Apr, 153-163.
- Cooper, Bridget. (2010). In Search of Profound Empathy in Learning Relationships: Understanding the Mathematics of Moral Learning Environments. *Journal of Moral Education*, Vol.39 (1), 79-99
- Doucet, A. (2006). *Do men mother? Fathering, Care and domestic responsibility*. Toronto: University of Toronto Press.
- Fresko, B. Reich, L. Sjöo, T. & Lönroth, C.(2013). Developing narratives as a pedagogical approach to fostering professional interpersonal competences. *Studies in Educational Evaluation*, Vol.39 (4), 232-239.
- Gieves, K., (1989). *Balancing Acts: On being a mother*, London: Virago.
- Griggs, J. (2012). *Just like Dad? A multigenerational study of fathering in Britain*, The Leverhulme Trust, Oxford: St Antony's College, University of Oxford.
- Hiatt-Michael, D. (2006). Reflections and Directions on Research Related to Family-Community Involvement in Schooling. *School Community Journal*, Spring Vol.16(1), 7-30.
- James, J. H. (2010). Teachers as Mothers in the Elementary Classroom: Negotiating the Needs of Self and Other. *Gender and Education*, Vol.22(5), 521-534.

- Kikas, E., Poikonen, P., Kontoniemi, M., Lyyra, A., Lerkkanen, M. & Niilo, A. (2011). Mutual Trust between Kindergarten Teachers and Mothers and Its Associations with Family Characteristics in Estonia and Finland. *Scandinavian Journal of Educational Research*, Vol.55(1), 23-37.
- Lupton, D., & Barclay, L., (1997). *Constructing fatherhood: Discourses and experiences*, London: Sage.
- Mowat, J. G. (2010). "He Comes to Talk to Me about Things": Supporting Pupils Experiencing Social and Emotional Behavioural Difficulties--A Focus upon Interpersonal Relationships. *Pastoral Care in Education*, Vol. 28(3), 163-180.
- Palkovitz, R. (2007). Challenges to modeling dynamics in developing a developmental understanding of father-child relationships. *Applied Development Science*, 11 (4), 190-195.
- Sikes, P. (1997). *Parents who teach: Stories from home and from School*, London: Cassell.
- Stoilescu, D., & Carapanait, G. (2011). Renegotiating Relations among Teacher, Community, and Students: A Case Study of Teaching Roma Students in a Second Chance Program. *European Education*, Vol.43 (2), 54-73.
- Thomson, R. & Kehily, M. J. (2011). Troubling reflexivity: the identity flows of teachers becoming mothers. *Gender & Education*, Vol.23 (3), 233-246.
- Walsh, S. D. ,Harel-Fisch, Y.& Fogel-Grinvald, H. (2010). Parents, teachers and peer relations as predictors of risk behaviors and mental well-being among immigrant and Israeli born adolescents. *Social Science & Medicine*, Vol.70 (7), 976-984.
- Washburn, G. N. (2008). Alone, Confused, and Frustrated: Developing Empathy and Strategies for Working with English Language Learners. *Clearing House: A Journal of Educational Strategies, Issues and Ideas*, Vol.81(6), 247-250.
- White, S. (2008). Mothers who are student teachers: navigating their dual roles in pre-service teacher education. *Studies in Continuing Education*, Vol.30 (2), 159-173.
- Winnicott, D. W. (1964). *The child, the Family and the Outside World*, the Estate of D. W. Winnicott.
- Yildiz, M. Yildirim, K. Ates, S. & Rasinski, T. (2012). Perceptions of Turkish Parents with Children Identified as Dyslexic about the Problems that They and Their Children Experience. *Reading Psychology*, Vol.33(5), 399-422.

TEACHING FOR EMPLOYABILITY: KEY CONCEPTS AND BEST PRACTICE PRINCIPLES

Henri Jacobs

*Centre for Work Integrated Learning and Skills Development, Central University of Technology,
Free State (South Africa)*

Abstract

Universities are faced with increasing pressure to produce employable, work-ready graduates for a constantly and rapidly changing work environment. Success in this respect would ultimately translate into evidence confirming the employability of students. Evidence from the 2011 graduate survey at the Central University of Technology, Free State in South Africa showed that 74% of graduates in qualifications with a meaningful Work Integrated Learning (WIL) component were employed as opposed to only 37% in qualifications with no meaningful WIL component. This paper investigates the reasons for this success to determine the key teaching and learning concepts as well as best practice principles in this regard.

The first objective is to look at the evidence of what WIL has produced as a quality blend of teaching and learning that have assisted students to be successful. The concept of learning is firstly reviewed which is followed by the link that WIL provides in augmenting student learning. The focus is placed on the effectiveness of WIL as pedagogy as well as the personal development of students through WIL that influences the way students learn and are ought to be taught to be successful through the identification of key concepts. The second objective is to analyze the hospitality management programme as one of the flagship programmes at the university wherein an average employment rate of 85% was achieved over the last five years. The analysis is done by using the WIL quality cycle as basis for the inquiry to determine best practice principles which are then validated against the empirical evidence used to determine the applicable key concepts with regards to teaching and learning.

WIL as pedagogy is dependent on a balanced and structured approach that includes all parties involved, encapsulated by an integrated curriculum approach that fosters the independence of the student to facilitate the transfer of learning. The greater autonomy accepted by students complement the development of their self-efficacy and work self-efficacy. WIL enhances the application of self-regulated learning by students and provides evidence for an approach to mismatch teaching and learning styles as opposed to the synchronization thereof. Various aspects and reasons were identified for the high employment rate, such as the manner in which students and employers are prepared for WIL, structure of the curriculum and the effective application of constructive alignment as related best practice principles identified.

Keywords: *Work Integrated Learning, Pedagogy, Employability, Curriculum*

1. Introduction

Heerde and Murphy (2009) allude to the importance of employability within the higher education context by indicating that higher education institutions are continually required to assess the employability of their alumni. This implies that higher education institutions also need to evaluate the teaching and learning methods used and the impact thereof on the employability of students. This assessment at the Central University of Technology, Free State (CUT) revealed the value of Work Integrated Learning (WIL) as an effective approach in teaching for employability which is the focus of this paper.

2. Design

The evidence produced by the 2011 graduate survey at CUT revealed the impact of WIL on employability in that 74% of graduates in qualifications with a meaningful WIL component were employed as opposed to only 37% in qualifications with no meaningful WIL component. The statistics

which support this statement is based on two sources, namely the exit survey performed on graduates at the 2011 graduation ceremonies wherein 1350 graduates disclosed their employment status. The other data source is that each qualification was ranked according to whether its WIL was inadequate (that is no WIL in the qualification or less than 3 months spent in the workplace when included), as against adequate (fully integrated with 3 months or more completed in the workplace) WIL. The reasons for this success are examined to determine the key teaching and learning concepts as well as best practice principles in this regard.

3. Objectives

The first objective is to examine the evidence of what WIL has produced as a method of teaching and learning in enhancing the employability of students. The focus then shifts to the effectiveness of WIL as pedagogy as well as the personal development of students through WIL that influences the way students learn and are ought to be taught to be successful through the identification of key concepts. The second objective is to analyze the hospitality management programme wherein an average employment rate of 85% was achieved over the last five years to determine best practice principles.

4. Methods

The concept of learning is firstly reviewed together with the link that WIL provides in augmenting student learning. The WIL quality cycle is then used to analyse the hospitality management programme as one of the flagship programmes at the university. The analysis is done by means of the WIL quality cycle to determine best practice principles which are then validated against the empirical evidence used to determine the applicable key concepts with regards to teaching and learning.

5. Discussion

Within the context of student development and learning, Behaviourist, Cognitive and Constructivist theories of learning have been identified as the three basic types of learning theory (Teaching Resource Center, 2009). Mahar and Harford (2004:9) also indicate that social and constructivist theories of learning do not generally investigate the nature of the experience of learning, but that WIL theory build upon social and constructivist theories and place experience at the centre of the learning process.

WIL is an educational process and experience with foundational pedagogy and theory that can be aligned with the processes and outcomes which intends to maximise learning through experience as stated by Smith, Brooks, Lichtenberg, McIlveen, Torjul and Tyler (2009). "Knowledge results from the combination of grasping and transforming experience" (Kolb 1984). WIL is described as: "An umbrella term for a range of approaches and strategies that integrate theory with the practice of work within a purposefully designed curriculum" as stated by Patrick, Peach, Pocknee, Webb, Fletcher and Pretto (2008). The bringing together of the theory of a discipline and its relevant work practice requires the involvement of industry, universities and students according to Papakonstantinou, Charlton-Robb, Reina and Rayner (2013) to form a unique tripartite relationship between the student, the employer and the university as stated by Newhook (2013). For students to learn effectively through direct implementation of their professional roles in real workplace settings a stakeholder-integrated approach is needed which involves sustainable relationships between all stakeholders (McEwen and Trede 2014; Fleming and Hickey 2013).

WIL is a socio-cultural experience through which shapes interpretations, meaning schemes and knowledge formation which in this type of contextualization are difficult to teach or learn in other environments than the workplace since the workplace provides unique pedagogies that form useful epistemological tools for facilitation (Choy & Delahaye 2009). Work placements are more complex than standard university subjects as they involve multiple relationships as well as a diversity of settings and experiences which require active engagement by students (Sturre, Keele, Von Treuer, Moss, Mcleod, and Macfarlane 2012). A greater dependence must therefore be placed on learners to identify the knowledge and skills they need to learn relevant to their work experiences. This requires of assessment to be conceptualised in terms of participation in practice scenarios and to encourage learners to actively engage in self-assessment (Boud and Falchikov 2006). The importance of self-reflective writings to capture and enhance the learning that had occurred is also emphasized by Beeth and Adadan (2006).

This brings the enhancement of student learning through the concept of self-regulated learning (SRL) to the fore. SRL is a: "...phrase used to describe the attributes of successful learners, ...these

students use various learning strategies and modify their strategies as necessary to improve their learning, ...to prepare them for successful careers” according to Schloemer and Brenan (2006). Support is provided by Mantle (2001) in urging teachers to: “... encourage the student to figure out alternative learning styles” for students to realize the benefits of SRL when they monitor their learning, recognise deficiencies, and respond by altering learning strategies as the key is for students to consider new approaches to learning (Schloemer and Brenan 2006). Although there is merit in the synchronizing of learning and teaching styles it should not necessarily be regarded as the best or only approach, since: Learners need to be able to adjust their style because they will be exposed to a variety of teachers with different teaching styles in various situations during their lives and reflection leads to self-knowledge and that this is fundamental to the development of professional practice.

The Hospitality Management programme (Central University of Technology, Free State 2014) is a three year national diploma with a compulsory WIL component of one year (two components of 6 months each). In structuring the analysis of the application of the WIL component of the programme, the WIL quality cycle as indicated by Forbes (2008) will be used. The WIL quality cycle includes the following key issues regarding WIL: Preparation of students and employers; The placement process; Visitation and monitoring (by Hotel School); Mentoring and assessment by employers as well as assessment and debriefing (by Hotel School). In preparing students for WIL an hour per week is scheduled for WIL on the time-table of the students during all 3 years of study. The topics covered during this period include CV and cover letter; Interview techniques; What to expect in the workplace; Professional behaviour; Work ethics; Importance of reputation; A culture of achievement and pride in the blazer of the Hotel School; Profiles of hotels and lodges used for WIL and the WIL quality cycle. At least 90% of students are placed without an interview which is largely due to the relationship of trust that exists between the central WIL office at CUT, the Hotel School and employers. Once placed, the students are visited at least once in the workplace during every WIL component by Hotel School staff for monitoring purposes. During such visits discussions are held with employers to elicit comment and feedback on the students’ performance. The discussions with students focus more on reports submitted and are the rubrics for assessment used given to students. Experience has shown that the quality of the mentoring provided by employers increases proportionately in accordance with the quality and type of relationship between CUT and employers as a result of an enhanced understanding of mutual needs and requirements as well as becoming more familiar with and trusting of one another. Assessments are done by the direct supervisors in the departments where students are placed. Clear guidelines are provided to employers in terms of the assessments required which contributes 20% to the final mark for WIL. Two important aspects to note regarding assessments done by the Hotel School is the use of reflection as well as constructive alignment. The assessment tasks are given as two-fold, namely a practical demonstration of competence evaluated by the employer and a written assignment submitted to the relevant hotel school lecturer. It needs to be noted that the written assignment in the format of a report must include a discussion on how the specific hotel where the student is placed for WIL performs each function, a comparison of how the hotel performs each function in relation to the student’s experiences at the hotel school, a discussion what the role of the student was in each function in the hotel and a request to provide recommendations for improvement for the hotel (Minnaar 2009:26). In this manner students are forced to reflect on knowledge already obtained and new knowledge gained.

6. Conclusions and recommendations

In conclusion, the following key concepts can be determined as crucial elements in teaching for employability:

- Knowledge results from the combination of grasping and transforming experience.
- The concrete experiences form the basis for observations and reflections where the reflections are assimilated and transformed into abstract concepts from which new implications for action can be drawn.
- The workplace is a unique site for learning and concerns all forms of learning and development at work such as learning processes, conditions, content and consequences for individuals in the workplace.
- WIL is a tripartite curriculum strategy that enhances the value of learning through the alignment and integration of academic learning with learning in the workplace.
- Students are likely to learn about themselves as well as for themselves in a work-based context which involve multiple relationships as well as a diversity of settings and experiences which require active engagement by students.

- A greater dependence must be placed on students to identify the knowledge and skills they need to learn relevant to their work experiences and need to be encouraged to actively engage in self-assessment.
- WIL as pedagogy is dependent on a balanced and structured approach that includes all parties involved, encapsulated by an integrated curriculum approach that fosters the independence of the student to facilitate the transfer of learning.
- Reflection leads to self-knowledge and that this is fundamental to the development of professional practice.
- SRL needs to be fostered as an attribute of successful learners since these students use various learning strategies and modify their strategies as necessary to improve their learning to prepare them for successful careers.
- The following best practice principles were identified and are validated against empirical evidence:
- The use of two WIL components in different years of study as part of the structure of the qualification is successful.

It offers opportunities to further build on knowledge and experience gained upon completion of the first WIL component. It becomes more of an integrated curriculum matter in this way rather than a bolt on experience as advocated by Leong and Kavanagh (2013). The second WIL period is also better set up in this manner as Richardson, Jackling, Henschke and Tempone (2013) found that students with previous working experience appear to be quicker in taking up opportunities offered and settle into organisations more quickly.

- The preparation of students for WIL needs to start during the first year of study and implemented as a continuous process for the duration of the qualification.

Usher (2013) determined that the challenges facing pre-service teachers during their practicum placements are numerous and they therefore need to be adequately prepared for placement.

The School of Nursing and Midwifery at Edith Cowan University in Western Australia provide students with foundational skills and the conceptual understanding required to implement a series of employment based projects and work based activities (Andre, Ewens & Foxall 2013).

- Quality relationships with employers and students are face-to-face and are key requirements which involve walking the extra mile to elevate relationships to a level of trust.

It requires the involvement of industry, universities and students (Papakonstantinou, Charlton-Robb, Reina and Rayner 2013) where a stakeholder-integrated approach is needed which involves sustainable relationships between all stakeholders (McEwen and Trede 2014; Fleming and Hickey 2013).

- Mentoring influences the performance of students and should include an induction programme for students.

Forbes (2007) had identified that workplace mentors/supervisors are critical to the success of workplace placements. Bates (2008) found that each placement experience is unique due to the diversity of settings and experiences in the workplace which necessitates the induction of students (Henschke 2013).

- WIL must be treated as an integrated curriculum matter which promotes the use of constructive alignment and reflection to enable the successful application of theory in the workplace.

As a curriculum issue the link between the institution and work place requires effective alignment (Edgar and Connaughton (2014). Coll and Eames (2004) concluded that a successful WIL programme requires a strong curriculum and pedagogy underpinned by theory as well as objectives that are relevant and appropriate to all parties involved.

- Bear in mind that WIL is primarily used as a recruitment tool by employers that influences the profile of students to be placed with employers: Know your employer – know your student.

WIL placements are used by employers as the ideal platform to recruit graduates according to Bates and Bates (2013). This view is supported by Sattler and Peters (2012) who found that: “Employers who provided WIL opportunities overwhelmingly preferred to hire graduates who had gained WIL experience at their own workplace.”

References

Andre, K., Ewens, B. & Foxall, F. (2013). Work Integrated Learning- A Whole of Curriculum Approach. <http://www.waceinc.org/durban2013/Refereed%20Papers/Australia/Kate%20Andre%20Bev%20Ewens%20and%20Fiona%20Foxall%20Edith%20Cowan%20University.pdf> Retrieved 2 February 2014.

- Bates, M. (2008). Work-integrated curricula in university programs. http://www98.griffith.edu.au/dspace/bitstream/handle/10072/22983/52961_1.pdf?sequence=1&origin=publication_detail Retrieved 3 February 2014.
- Bates, A. & Bates, L. (2013).: WIL: Essential for work in child protection? *Asia-Pacific Journal of Cooperative Education* 14, 45-58.
- Beeth, M. E., & Adadan, E. (2006). The Influences of University-Based Coursework on Field Experience. *Journal of Science Teacher Education* 17, 103-120.
- Central University of Technology, Free State. (2012). *Next steps in the STEPS process*. Bloemfontein: Central University of Technology, Free State.
- Choy, S.C. & Delahaye, B.L. (2009). University-industry partnership for pedagogy: some principles for practice. <http://www.waceinc.org/papers/vancouver/Australia/Choy,%20Delahaye.pdf> Retrieved 5 June 2013.
- Coll, R.K. & Eames, C. (Eds). 2004. *International Handbook for Cooperative Education*. Boston: World Association for Cooperative Education.
- Fleming, J. & Hickey, K. (2013). Exploring cooperative education partnerships: A case study in sport tertiary education. *Asia-Pacific Journal of Cooperative Education* 14, 209-221.
- Forbes, B.E. (2008). *Work Integrated Learning: Quality, Capacity and Curriculum*. A PowerPoint presentation delivered at the SASCE Colloquium and Workshop on 15 September 2008 at the University of Johannesburg, South Africa.
- Forbes, B. E. (2007). *Learner Support and Co-ordination of Students on Work Integrated Learning Programs*. Paper presented at the 15th World Conference on Co-operative Education, June 2007, Singapore.
- Heerde, J. & Murphy, B. (2009). Work-Integrated Learning Annotated Bibliography. *Journal of Agricultural Education* 50, 1-44.
- Kolb, D.A. (1984). *Experiential Learning*. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.
- Leong, R. & Kavanagh, M. (2013). A work-integrated learning (WIL) framework to develop graduate skills and attributes in an Australian university's accounting program. *Asia-Pacific Journal of Cooperative Education* 14, 1-14.
- Minnaar, R. (2009). *Experiential Training Study Guide GAE32ZT*. Bloemfontein: Central University of Technology, Free State.
- Newhook, R. 2013. Perceptions of Risk in Co-operative Education. *Journal of Cooperative Education and Internships* 47(1):78-93.
- Papakonstantinou, T., Charlton-Robb, K., Reina, R.D. & Rayner, G. (2013). Providing research-focused work-integrated learning for high achieving science undergraduates. *Asia-Pacific Journal of Cooperative Education* 14, 59-73.
- Patrick, C-j., Peach, D., Pocknee, C., Webb, F., Fletcher, M. & Pretto, G. (2008). *The WIL [Work Integrated Learning] report: A national scoping study [Australian Learning and Teaching Council (ALTC) Final report]*. Brisbane: Queensland University of Technology.
- Richardson, J., Jackling, B., Henschke, K. & Tempone, I. (2013). Developing a collaborative model of industry feedback for work placement of business students. *Asia-Pacific Journal of Cooperative Education* 14, 28-43.
- Sattler, P. & Peters, J. (2012). *Work-Integrated Learning and Postsecondary Graduates: The Perspective of Ontario Employers*. Toronto: Higher Education Quality Council of Ontario.
- Schloemer, P. & Brenan, K. (2006). From students to learners: Developing self-regulated learning. *Journal of Education for Business*. November/December, 81-86.
- Smith, M., Brooks, S., Lichtenberg, A., McIlveen, P., Torjul, P. & Tyler, J. (2009). Career Development Learning: maximising the contribution of work-integrated learning to the student experience. <http://nagcas.org.au/ALTC/uploads/file/63267%20SS%20ALTC%20Report.pdf> Retrieved 5 March 2013.
- Sturte, V., Keele, S., Von Treuer, K., Moss, S., Mcleod, J., & Macfarlane, S. (2012). Construction of an instrument to measure effectiveness of placement settings and experiences. *Asia-Pacific Journal of Cooperative Education* 13, 225-238.
- Teaching Resource Center. (2009). Theories of learning. <http://gsi.berkeley.edu/resources/learning/introduction.html>. Retrieved 2 July 2009.
- Usher, A. (2013). Developing Students' Professional Learning Identities: Early Findings from an AVID-focused Site-based Teacher Education Model. <http://www.waceinc.org/durban2013/Refereed%20Papers/Australia/Adam%20Usher%20University%20of%20Victoria.pdf> Retrieved 2 February 2014.

TEACHING SCIENTIFIC RESEARCH AND PRACTICAL APPLICATION OF THE CONCEPT OF CHARGE DISTRIBUTION TO STUDENTS

Andrey Lider & Vitaly Larionov

Physics Department, Tomsk Polytechnic University, 30 Lenin Ave., Tomsk, 634050 (Russia)

Abstract

We examine the pedagogical suitability and a teaching sequence for the concept of charge distribution on the surface of solid bodies and the associated electrical capacity. The article discusses the application of the recently discovered phenomenon of a mosaic structure of charge distribution that emerges on the bodies from friction. Introduction into this phenomenon for first-year students is accompanied by practical implementation so that the students could be prepared for the future implementation activities involving the knowledge of physics. The results of the research show that project-based teaching supplemented by the MIE (method of interactive education) strategy as part of both in-class hours and independent study encourages the students to understand the correlation between the micro-distribution of charges and the ways of creating and analyzing charge distribution for practical application. The MIE strategy allows for increasing the capabilities for solving the pressing tasks of physics' teaching.

Keywords: *interactive learning, practical application.*

1. Introduction. Problem Statement. Problem Research Methods

The concept of charge and properties of charged bodies is an important part of teaching at different levels. Charging of bodies is first taught in primary school. These ideas gradually integrate into more complex ideas for interpreting electromagnetic phenomena in other areas, thus providing a solid foundation for understanding that a lot of modern technology bases on electromagnetism. Also, electromagnetic theory provides a good basis for teaching the skills of scientific reasoning involving the potential model and the pattern of interaction between macroscopic phenomena and microscopic theory Baytekin et al (2011), Pollock (2009), Hake (1998), (Dori, Hult, Breslow & Belcher, 2007), Redich (1999). The teaching of electromagnetism starts with electrostatics with a focus on the properties of charged substances and the ways of obtaining charges on the body surface (induced charge, body electrization and discharge), charge conservation, Coulomb's law and the principle of superposition. Here, the teaching is limited to the study of uniform charge distribution Kohlmyer et al.(2009), (Ding, Chabay, Sherwood & Beichner, 2006). Such a process analysis sequence later leads to unclear understanding of the concepts of charge, difference of potential, electric capacity and artificial ways of creating charges on capacitors. As a rule, when students are explained those phenomena, not enough attention is paid to the practical models that are necessary for the students to be able to apply those concepts confidently. Sometimes, this would even lead to the discrimination of concepts and their interconnections [(Mulhall, Mckittrick, & Gunstone, 2001), (Benseghir & Closset, 1996), (Guisasola, Zubimendi, Almudi & Ceberio, 2002).

It is vital that the body charging process is explained via the new model that refines fundamental electrical processes. Firstly, body charging processes are the starting transition from the discipline of electrostatics to electric current where no normal electric circuit exists. The model requires significant knowledge of the electric nature of substance; the model unites the concepts of electric charge and electric potential. Secondly, in technical applications of electric processes, body structure is required that allows for accumulating big charges on small objects. Given the mosaic distribution of charges on bodies, the use of substances and the concept of electric capacity in general need refinement (Baytekin et al., 2014), (Guisasola et al., 2002). It is vital to focus attention on the model that explains the efficiency of body charging processes and the concept of electric capacity. In the physics academic program, this topic is studied within the discipline of electrostatics and before electric circuits (Benseghir & Closset, 1996) (Guisasola et al., 2002, 2010). During teaching that involves the understanding of the electric capacity concept, one should be able to not only do calculations using the standard formula but also understand

what happens during body charging. In the new model, it is necessary to know how the charges are distributed on the body surface. To correctly use a formula (for example, $C = Q / U$ (1), where U is the difference of potential), it is vital to switch to causal reasoning based on the phenomena taking place and on the changes that are necessary during body charging (Kohlmyer et al., 2009). After that, the interaction between different parts of the general scheme (the battery, the environment and the bodies that interact) can be discussed, taking into account the changes happening when the current passes through. This is what allows for explaining the mechanism of acquiring the new equilibrium (Mulhall, Mckittrick, & Gunstone, 2001). The energy model (Guisasola et al., 2010) provides a more common and less fragmented vision of the current passing through the circuit having a capacity. Here the students should be taught this directly so that they could use this phenomenon in practical applications. To this end, the distribution of the potential of each charge acquired by the bodies should be discussed, taking into account that it is connected with the work performed by the environment. State standards of many countries envisage the students being able to explain the movement of charges in conductors and the processes of body charging, basing their explanation on the concept of electric capacity. This implies that students should be familiar with body charging processes and with devices like capacitors. Thus, at physics courses taught at universities, students use quality models based on charge attraction and repulsion and explain charging and discharging of bodies. A lot of works in different countries have been devoted to the problem of body charging efficiency and to the explaining models that include the concepts of charge, difference of potential and electric capacity [(Guisasola et al., 2010), Irodov I.E. (1986). This means that among the first principles to be offered by the sequence of content delivery in use is not a model based around electric forces but another one that requires contemplating the concept of the difference of potential and the electric capacity. Thus, the explanatory model gets increasingly complicated. Several models can be suggested that provide for the understanding of this fact and for the clarification of its implementation in different capacitor constructions. However, the model based on the use of standard formula (1) poses a series of difficulties for the students, because the model of forces is a more direct causative model than the energy model (Guisasola et al., 2002). The experience in discussing this problem with students shows that the mosaic structure can be implemented as a specific configuration of heterogeneous substances that fill the space between the capacitor planes. The capacity of a capacitor changes because of charge distribution alterations, both on the material surface and inside its volume (Fig. 1., a, b, c), taking place because of the use of different materials.

Figure 1. The scheme of dielectric materials filling flat capacitors



Another problem that is important for understanding is the time over which the charge is distributed on the surface of a body and throughout its volume. This ensues from the structure of formula (2) $U_c = (1/C) \int I dt$ (2). If the system has a capacity, then under the current impulse application, the

capacity is charged to reach a certain potential U_c (formula (2). Students should understand that the capacity can alter during the current impulse application (formula (2). Thus, for practical exercises, project type tasks Hake (1998), Dancy & Henderson (2007), Zelichenko & Larionov (2009) should be introduced, in particular, those for designing capacitors (e.g. like those shown in Fig. 1). As a result, the mechanism of transforming instructional tasks into project tasks (those of implementational nature) is actuated. The model of problem-oriented teaching of physics (Zelichenko & Larionov, 2009) holds true for any types of activities at seminars and laboratory workshops and includes a mechanism for managing the project performance. The model includes the following: task administering; task solution, the detection and structuring of the problem and the problem situation; searching for the problem solution, creating computational software, formulating the idea at the project level; review of devices available in cited literature (also using the Internet); project creation, with some elements of technical implementation; project presentation and defense.

At each stage and in every element of the system, a target and motivational component is involved. This happens because individual parts of the teaching system under consideration contribute differently to the achievement of goals. In this vision, the technical creativity of the students Eylon, Ganiel (1990), (Zelichenko & Larionov, 2009), is regarded as an exploratory activity aimed at the final result, which is not limited to the knowledge acquisition and retention but also envisages the elaboration of the project implementation proposal. The management of students' project activities can be illustrated

through the example of studying the electrization phenomenon via friction. This simple and widely known phenomenon can have a project- and implementation-driven future.

It is normally assumed that during the electrization of two different dielectrics by friction, their surfaces acquire approximately homogeneous distribution of charges of the opposite signs. However, in a number of occasions body electrization leads to the mosaic distribution of charges (Baytekin et al., 2011) on the surface of a body, with randomly interspersed oppositely charged areas (Fig.2). The following problems should be isolated and discussed here: the duration of dielectrics' friction, the pressure applied, the way of friction and the heterogeneity of the surfaces. It is necessary to highlight that those factors do not have a considerable effect on the emergence of a mosaic. In addition, no mosaic distribution of the opposite charges occurs on the surface made of elementary substances (e.g., silicon and aluminum) exposed to identical electrization.

Figure 2. Uniform (a) and mosaic (b) charge distribution after the contact and separation of two surfaces 1 and 2 (the light part of the sample marks the positive charge, the dark one, the negative charge) (Baytekin et al., 2011)

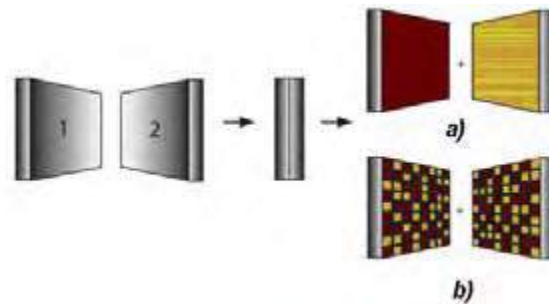
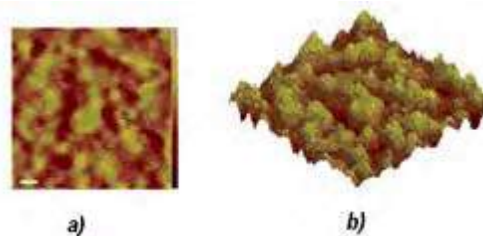


Figure 3. Polycarbonate surface after the contact with polydimethylsiloxane surface (Baytekin et al., 2011). Positive charge obtained. Area density is 0.16 nC/cm^2 . Mosaic cell size is about 100 nm . Potential is 1 V



This physical problem should be divided into three parts: the electrization of metal by metal, of dielectric by metal and dielectric by dielectric. For the first combination, the electrization process is well-studied: charge distribution is taking place until the Fermi levels of the two metals get even, when the substance with a higher (lower) Fermi level is charging positively (negatively). The discussion of this phenomenon makes it easier for a working subgroup of students to move forward to the concept of the emergence of contact potential difference Zelichenko, Larionov and Pak (2012). Students can create a model of mosaic distribution of the irregularities on the surface of a dielectric, as well as its alteration and calculation method. The project implementation plan emerges during the analysis of all the projects formulated by all the students of the group on the basis of the full problem analysis. Problem books, for example Irodov (1986), suggest tasks for calculating charges with non-uniform distribution. Proceeding to the problem solution after conducting the problem analysis with students allows for creating a device for studying such a charge distribution on the surface of a dielectric.

2. Method of a project-type class implementation

Let us consider the solution to the problems outlined in the introduction through the example of studying discharge distribution on the surface of a body. Discharge distribution on the surface of a body is of paramount importance for the generation of materials with targeted properties, generation of charged particle focusing systems, formation of variable capacitors. Moreover, it allows gaining a better understanding of the notion of electrical capacitance (Guisasola et al., 2002, 2010 and teaching students to measure distributed charges (Baytekin et al., 2011), Irodov (1986) with a predetermined manner of their distribution on material surfaces. The demonstration of this phenomenon as well as the formation of systems with distributed charges is an important practical task in terms of preparing prospective students to implementational engineering activity and is interesting as part of the teaching process, as teaching requires creativity driven experiments. As a rule, after students successfully solve a problem, they are

asked to implement a device and test the controlled quantitative values of discharge distribution on the surface of a body as well as to use them for demonstration and assessment purposes.

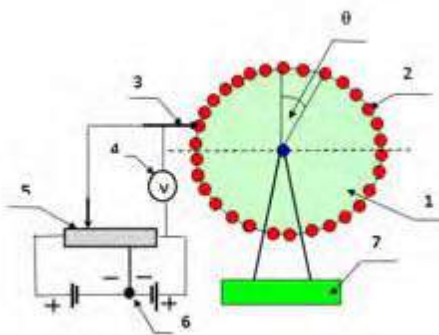
The project task is to make a device that would allow producing a distributed electrical charge on the surface of a dielectric with a predetermined manner of distribution on the dielectric being charged. Students make up working groups under the teacher's guidance to implement the project. For these purposes, a survey matrix is used that reflects students' requests and is adjusted by the teacher. An example of the device offered after solving the task is given in Fig. 4. The device consists of a dielectric disk with same-size (radius R) metal balls fixed around its large perimeter (circle), a direct current supply, an adjustable resistor to vary the voltage on the balls, a voltmeter and an electric metal probe that can move from one ball to another. The metal probe with a pointed end is brought close to a ball. The probe is connected to a voltmeter in series, which, in its turn, is connected to the direct current supply through the adjustable resistor. The said resistor varies the voltage applied to the electric probe and is used to set the target voltage on that probe. Its value is controlled by means of a voltmeter. The disk is turned so that the probe could touch the next ball, the turning angle θ is measured and the adjustable resistor is used to set a new voltage on the probe. With each turn, the turning angle is measured and the voltage on the probe is changed. The actions are repeated until all the balls of the disk are charged. For the device to operate, we determine the electric capacity C for the ball according to the following formula: $C = 4\pi\epsilon_0 R$ (2), where ϵ_0 is an electrical constant, and R is the ball radius. The charge Q of each ball is determined as $Q = C\varphi$ (3), where φ is the voltage applied to the ball, which equals the probe voltage. The probe voltage is set using the adjustable resistor. Consequently, the ball charge $Q = 4\pi\epsilon_0 R\varphi$. Since the potential φ for both the probe and the ball is changed through the adjustable resistor at every turn of the disk by the angle θ , the charge of the disk is changed according to the required principle. For instance, if $\varphi = \varphi_0 \cos \theta$, then $Q = 4\pi\epsilon_0 R\varphi_0 \cos \theta$ (4), where φ_0 is the initial voltage (potential) of the probe and the first ball. The physical basis of the device is the dependence of a metal ball charge on the size of the ball. For the charge to be distributed smoothly along the disk perimeter, the size balls must be far smaller than that of the disk, i.e. more than 10 times smaller.

Example of implementation in experimental workshops of the university business center.

The device is made of a circle with the radius of about 60 mm cut from a 1-mm-thick sheet of dielectric material (Teflon). One drills orifices therein with the diameter of 1 mm at the distance of 0.5 mm from each other along the circle with the radius of 50 mm. Then one glues metal balls 1 mm in diameter into the orifices. The disk is mounted on a firmly fixed dielectric stand so it could rotate around the axis that goes through its geometrical center. The probe is fixed firmly on an isolated holder and brought close to the balls of the disk. The probe is a metal rod with the diameter of 0.5-0.8 mm and the length of 15 mm.

A way to determine the potential in the center of the disk is yet to be technically implemented.

Figure 4. The scheme of a device to form a distributed charge on the surface of a body



Legend to Fig.4: (1) dielectric disk (students choose the material for it by themselves) that is mounted on the stand (7); (2) metal ball; (3) metal probe, which is a 10-mm needle with 2-mm diameter; (4) voltmeter; (5) adjustable resistor connected according to the scheme of a potentiometer; (6) power supply. The following additional issues are to be discussed: how to charge the balls positively and negatively, how to connect an adjustable resistor as a voltage divider, what voltmeter to choose, etc. By using the Internet to search for the devices and their possible schemes one can minimize the time needed for that search.

One of the ways to organize students' joint activities and to form physical ideas at the project level can be simple tasks with an implementational follow-up. A collection of problems for university students Irodov (1986) invites students to determine the difference in refractive indices of an ordinary and an extraordinary beam in response to an electric field applied on an isotropic material (Kerr effect). This problem can easily be turned into an implementational project. One can design Venetian blinds with

each slat being an isotropic material. Students stick conductive strips on the slat edges and apply DC voltage on them.

3. Conclusion

While accomplishing the projects aimed at studying the phenomena of electrization and electric capacity, students offered about ten options to take advantage of this phenomenon in practice. Among the options is the utilization of contact potential difference, piezoelectrics and the devices for creating and researching the charges with random distribution of their density throughout the dielectric's surface. As a result, we observe an increase in the efficiency of managing the performance of project activities by students. At the project level that involves students' teamwork, the said organizational and procedural aspects of professionally oriented physics teaching allow for changing the physics teaching system at universities so that the implementational nature of the future professional activities (i.e. the activities of a certain purport) could be reflected in the training of a future engineer in physics. The suggested method and model do not only teach subexperiments and objectives but also leads to formulating physical ideas at the project level, as well as amplifies their pre-professional preparation and subsequent motivation for studying future professional disciplines. The tasks under consideration bear the property of structural comprehensiveness. It rules out same-type tasks for inserting numeric expressions, it envisages element-wise analysis and the performance of design and graphics rendering with the help of IT technologies that allow for demonstrating that the tasks intrinsically contain the elements of the past and future knowledge. The study of a physical phenomenon using the project method creates synergistic, structure-forming effect that unites series of phenomena for their new practical applications.

References

- Baytekin, H. T., Patashinski, A. Z., Branicki, M. et al. (2011). Mosaic of Surface Charge in Contact Electrification. *Science*. 333, 308-312. doi: 10.1126/science.1201512
- Pollock, S.J. (2009). Longitudinal study of student conceptual understanding in electricity and magnetism. *Phys. Rev. ST Phys. Educ. Res.* 5, <http://dx.doi.org/10.1103/PhysRevSTPER.5.020110>.
- Hake, R.R. (1998). Interactive engagement versus traditional method: A six-thousand-student survey of mechanics test data for introductory physics courses. *Am. J. Phys.* 66, 64-74.
- Dori, Y.J., Hult, E., Breslow, L., & Belcher, J.W. (2007). How much have they retained ? Making unseen concepts seen in a freshman electromagnetism course at MIT. (2007). *J. Sci. Educ. Technol.* 16, 299-323. <http://dx.doi.org/10.1007/s10956-007-9051-9>.
- Redish, E.F. Milliken Lecture: Building a science of teaching physics. (1999). *Am. J. Phys.* 67, 562-573.
- Kohlmyer, M. A., Caballero, M.D., Catrambone, R., Chabay, R.W. et al. (2009) Tale of two curricula: The performance of 2000 students in introductory electromagnetism. *Phys. Rev. ST Phys. Educ. Res.* 5, 020105.
- Ding, L., Chabay, R.W., Sherwood, B.A., Beichner, R. (2006). Evaluating electricity and magnetism assessment tool: Brief electricity and magnetism assessment. *Phys. Rev. ST Phys. Educ. Res.* 2, 010105. <http://dx.doi.org/10.1103/PhysRevSTPER.2.010105>.
- Mulhall, P., Mckittrick, B. & Gunstone, R. (2001). A perspective on the resolution of confusions in the teaching of electricity. *Res. Sci. Educ.* 31, 575-587.
- Benseghir, A. & Closset, J.L. (1996). The electrostatics electrokinetic's transition: historical and educational difficulties. *Int. J. Sci. Educ.* 18, 179-185.
- Guisasola, J., Zubimendi, J.L., Almudi, J.M. & Ceberio, M. (2002). The evolution of the concept of capacitance throughout the development of the electric theory and the understanding of its meaning by University students. *Sci. Education*. 11, 247-253.
- Guisasola, J., Zubimendi, J.L. & Zuza, K. (2010). How much have students learned? Research-based teaching on electrical capacitance. *Phys. Rev. ST-Education Res.* 6. 0201102. <http://dx.doi.org/10.1103/PhysRevSTPER.6.020102>.
- Irodov, I.E. (1986). *Problems in General Physics*. Moscow: Mir.
- Zelichenko, V.M. & Larionov, V.V. (2009). Problem-oriented approach to solving task in physics at special schools and university. *Tomsk State Pedagogical University Bulletin*. 5, 10-15.
- Eylon, B. & Ganiel, U. (1990). Macro-micro relationships: the missing link between electrostatics and electrodynamics in student's reasoning. *Intern. Journal of Science Education*. 12. 79-94.
- Zelichenko, V.M., Larionov, V.V. & Pak, V.V. (2012). Joint activities of students during practical training in physics: the information of physical ideas the projects level. *Tomsk State Pedagogical University Bulletin*. 2. 147-151.

TEACHING ADULT LEARNERS: A PIECE OF CAKE?

Jane Iloanya

Department of Higher Education, Botho University (Botswana)

Abstract

Teaching adult learners comes with a lot of strengths and challenges. This paper discusses the issue of lifelong adult education in Botswana's institutions of higher learning. It examines the experiences of adult learners, the teachers of adult learners and the methods which can be used to enhance the teaching of adults. Adult learners come to class with a wealth of knowledge, experience, and some challenges too. The teachers of adults should apply the right teaching methodologies to overcome the challenges of teaching adult learners in order to facilitate effective teaching and learning in an adult education class.

Keywords: *Adult Learners, Teaching, Lifelong learning, Challenges*

1. Introduction

Adult education has gained prominence in the 21st century and Africa as a continent has not been left out in this quest for the acquisition of knowledge.

Adult learners are a diverse group of learners whose ages range from 25 years to older. They typically comprise of people with a wide range of abilities, educational and life experiences, and diverse cultural backgrounds. Adult education helps to promote learning in adulthood and empowers adults to live a successful life. It therefore, contributes immensely towards increasing competence and a sense of personal fulfilment in the lives of adults and their relationship with other people. Most adults would prefer to pursue their academic studies on a part-time basis, while maintaining alternative instructional delivery systems such as online learning, blended and distance learning or learning by correspondence (Jarvis, 1995).

The motivation to write this paper was borne out of the author's experiences as an adult learner while pursuing an advanced degree in Education and as a teacher of adult learners as well. This paper focuses on determining the methods of teaching adults in two selected tertiary institutions in Botswana. The paper examines the experiences of adult learners, the challenges faced by teachers of adult learners and the approaches to be used in order to encourage and attain effective teaching and learning in an adult education class.

1.1. Adult basic education and lifelong education

Basic education is not limited to children. The goals of the Jomtien conference (1990) and Dakar conference (2000) emphasised the provision of basic education to children, youth and adults. In promoting basic Education for All (EFA) the goals of the Jomtien conference addressed the need for a reduction in the adult illiteracy rate to about one-half of its 1990 level by the year 2000. Emphasis was laid on the promotion of female literacy, in order to reduce the current disparity between the male and female illiteracy rates. The Dakar goals called for a 50% improvement in the levels of adult literacy by the year 2015. This would be geared towards alleviating the disparity between male and female literacy rates, and the encouragement of equitable access to basic and continuing education for adults (Jomtien 1990; Dakar 2000).

In the context of this paper, adult basic education is education designed to teach adults the basics, foundations or essentials. It is a form of education designed to meet adults' basic learning needs for human fulfilment and fundamental educational development. Adult basic education may include: learning how to read and write, recognising the importance of documents such as maps and catalogues, making simple compilations and arithmetic. On the other hand, adult lifelong learning goes beyond basic education. It involves: going to college at an adult age, returning to college to finish or complete a degree, working toward a university degree, being involved in continuous professional development and taking classes as an adult for the sake of keeping oneself busy (Collins 1991).

This paper focuses on adult lifelong education aimed at acquiring degree qualifications for continuous professional development. The need for education and the quest for an improved standard of living associated with being educated, have driven adults to continuously upgrade and improve themselves. In the context of this paper, lifelong education covers the whole spectrum of formal, non-formal and even informal learning activities. Adult lifelong learning enables adult learners to acquire that extra and relevant knowledge geared towards the improvement of their professional qualifications. Consequently, the adult learners develop positive attitudes and skills needed for progress and self-fulfilment in all aspects of life.

2. Theoretical Perspective

2.1. Adult learning theory (principles)

The general belief is that adults learn differently from children. There are propositions concerning adult learning which have influenced the art of teaching and learning in higher education (Fry, 2009). Adult learning theories are essential to understand how adults learn and the educational implications thereof.

Andragogy is simply the art and science of helping adults learn (Knowles 1984). Although andragogy has been criticised by some teachers, it is still very useful in the field of adult education. Many university teachers acknowledge that they have seen the characteristics of adult learning principles being manifested by their learners.

The theory of adult learning (Andragogy) espouses five basic principles:

- a) Adults are internally motivated and self-directed.
- b) Adults have accumulated life experiences which they bring to the learning environment.
- c) Adults are more prepared and ready to learn when they experience the need to know something.
- d) Adults are more problem-centred than subject-centred.
- e) Adults are practical and like to be respected.

The theory of Andragogy has, to a large extent, influenced teaching and learning, especially in higher education. Many types of learning used at a higher education level, such as experiential learning, student autonomy, discussions and self-directed learning, are derived from the principles of adult learning.

Given that the focus of this paper is to find out the methods of teaching adults in Botswana's institutions of higher learning and how adults combine work, social commitments and other engagements with learning; the theory of Andragogy therefore serves the right purpose as the theoretical framework guiding this paper.

3. Methodology

A qualitative approach was used to carry out this research. It involved the use of interpretive methodologies to discuss the phenomenon of teaching adult learners. The use of a qualitative research approach made it possible for the participants to explain and give their own interpretations of the phenomenon from their own subjective position. Marshall and Rossman (1995) posit that qualitative research gives opportunities for exploratory and descriptive research that assumes the value of context and setting, and allows the researcher to experience a deeper understanding of the participants. Similarly, Onwuegbuzie and Leech (2006) state that qualitative research gives room for the participants to freely express themselves and interpret the phenomenon under investigation. The question of how easy it is to teach adult learners in Botswana can best be researched by the use of a qualitative approach, which allows for an in-depth and detailed description of events. Structured interviews, focus group discussions and document analysis were utilised as data collection instruments.

This paper was informed by the adult learners that the author taught at the post graduate level in two institutions in Botswana. The time period covered by the study is from 2009 – 2014, a time during which I experienced the difficulties of being an adult learner myself, and a tutor and teacher of adult learners. Due to time and financial constraints, I decided to limit my research to the institutions in the capital city of Botswana, where I currently reside and have worked in the past ten years.

A total of ten lecturers of adult learners were interviewed. The interview questions centred around their experiences of teaching adult learners, the challenges of being a teacher of adults, and the approaches to be used to encourage effective teaching and learning in an adult education class. Through the use of focus group interviews, ten adult learners were interviewed. The focus group interviews focused on the challenges and advantages of being an adult learner. The essence of the focus group interviews was to find out from adult learners, how challenging and worthwhile it is to acquire

qualifications as adult learners. Most of the adult learners combine work and study, along with other personal and community commitments. As such, it was of great importance to get a sense of their own view, as regards the issue of adult teaching and learning.

4. Results and discussion

The findings from this study have been recorded in three sub-sections. In sub-section one, the experiences of adult learners are discussed. Sub-section two focuses on the challenges of teaching adult learners at a higher education level, while sub-section three discusses the approaches to be used to encourage effective teaching and learning in an adult education class.

4.1. Being an adult learner

In Botswana, adult learners constitute a substantial proportion of students at tertiary level. These learners enrol in institutions of higher learning for different reasons. They are inspired either by the acquisition of qualifications that will help them boost their socio-economic status, improve their chances of getting well-paid jobs in the labour market, to get promoted to better positions while on the job, or simply to acquire more knowledge.

How does it feel to be an adult learner? What are the ups and downs experienced by adult learners? From the perspectives of adult learners that I interviewed during this research study, 80% of them agreed that the need to acquire more qualifications as adult learners emanate from the premise that, the more highly educated one is, the better the chances of getting better paying jobs. In this day and age of economic meltdowns, people want to earn higher education qualifications either as part of continuous professional development to keep them on the job or to get very good jobs to guarantee them earning higher incomes. Furthermore, 70% of the adult learners interviewed, indicated that being an adult learner is quite encouraging. Factors such as being mature, experienced and focused, along with the capacity to effectively comprehend subject matter, were highlighted as reasons why being an adult learner is rewarding. The respondents noted that as adult learners, they are driven to take their studies seriously, are responsible for paying their own fees and have a clear understanding of why they have chosen to pursue further qualifications.

Adult learning also comes with a number of challenges for the adult learner. When asked about the challenges involved in adult learning, 85% of the adult learners expressed the view that, it is not easy to be an adult learner. Adult learning involves making a lot of sacrifices in terms of time management, in order to grapple with other commitments, which the adult learner has. Most adult learners are employed as full-time staff in their respective places of work. The result is that majority struggle as they combine work, family responsibilities and their studies. Assignments and examinations are part of their study obligations on the academic front, while on the social side of things; many have the usual social activities which include attending weddings, meetings, school plays or special events for their children. The responses revealed that it is inevitable that these activities will at times clash with their hours of study and other academic obligations.

Apart from time-management and clashing of events, other challenges of life affect adult learners as they struggle to make ends meet. Health problems, financial problems and a limited attention span, due to high stress levels, can be a severe source of hindrance to effective learning by adult learners.

In this day of the 'digital natives', adult learners face challenges of adapting to the use of new technology. 75% of the adult learners that I interviewed expressed their views on the difficulties they face in getting used to the introduction of new instructional technology. New technology comes with new demands and some adults are 'techno-phobic'.

4.2. Teaching adult learners: challenging?

Teaching Adult learners can be very interesting and quite challenging at the same time. They bring in a wealth of knowledge and information to the class which enhances the process of teaching and learning. The teacher of adult learners therefore, should be prepared psychologically, to face the advantages and disadvantages of teaching adult learners. The first step should be to have a very good understanding of the adult learners and, consequently, direct teaching to their needs.

Findings from the study indicate that, one of the major challenges experienced by the teacher of adult learners is the frustration caused by adult learners not having enough time to attend to school work because of the many commitments they are faced with. 70% of the teachers of the adult learners that were interviewed indicated that lack of time on the part of most adult learners, is a major constraint. In cases where the adults are expected to attend classes regularly, one finds it difficult to have a full class attendance. They miss classes and expect the teachers to understand and bear with them. Some adult

learners insist that since they are adult learners, class attendance should not be made compulsory for them. This is a very big challenge and is quite a concern.

Adult learners also have the tendency of not meeting deadlines for the submission of their assignments. 75% of the respondents indicated that most of their adult learners have the tendency to ask for extended deadline dates because they are unable to meet the stipulated deadlines. While this is a common problem experienced in teaching adult learners, some adult learners do take their assignments seriously.

Due to the fact that adult learners come to class with a wealth of life experience and knowledge, it could be a plus or a minus for the teacher of adults. A plus, because it would be easy to teach them, as they comprehend the subject matter well and contribute meaningfully during the teaching and learning process. Most adults like to be appreciated and respected by their teachers. They see themselves as equal to their teachers. If their teachers understand them from this perspective and accord them the respect and recognition that they seek, then all will be fine. On the other hand, if the teachers try to exert too much authority over the adult learners, problems often do arise.

Some adult learners have attitude problems and they bring this to the teaching and learning environment. While some adult learners get sponsorship to pursue their studies, majority of them pay fees and have other financial commitments to meet. These social and personal problems take their toll on adult learners and negatively affect the way they handle the teaching and learning process. They want value for their money and time, and the teachers are the direct victims of their discomfort and complaints.

Despite all the challenges associated with the teaching of adult learners; one cannot deny the fact that the maturity, sense of responsibility and focus found in some adult learners, enhances teaching and learning. In this day of the use of technology in teaching and learning, some adult learners struggle to embrace the introduction of new technology. While some take long to master the use of modern technology, others are techno-phobic. At the university where I teach, new technology teaching aids such as Blackboard and Turn-it-in are used to enhance teaching and learning. While some adult learners are happy and eager to embrace new technologies some complain that they do not like technology. The teacher of adults would have to contend with these.

4.3. Towards effective teaching and learning for adults

Teaching adults can be made easier and more worthwhile if the teachers of adults could use the right approaches when teaching adult learners. In this regard, the teachers should find out why the adult learners enrolled for the course of study and their different backgrounds. This will guide the teachers in finding out the expectations of the adult learners and how to help them realise their goals.

Findings from the study indicate that adult learners do not like to be treated like children. Teachers should accord them the respect they deserve, and allow them to be interactive during lessons. When they are involved in the learning process, they should be allowed to own the session, to develop a sense of belonging and confidence.

Discussion groups should be used to encourage adults to participate actively during lessons. The use of tutorial groups will go a long way in bringing out the best from the adult learners. Opportunities should be provided for the adult learners to work together and share different ideas in group discussions. Sharing their experiences with one another will contribute effectively in the enhancement of teaching and learning for the adult learners.

It is important to direct adult learners to the right resources for effective teaching and learning. The use of modern technology such as the Blackboard, Moodle, ClickUP, among others will help adult learners to access education from any part of the world. Efforts should be made to help them familiarise with the use of modern technology. It is imperative that teachers of adults understand the challenges that the adult learners face and encourage them to forge ahead. They should be positively reinforced whenever they do well, and politely corrected when they are at fault.

5. Conclusion

Findings from this study indicate that adult learners engage in lifelong learning for different reasons. The main driving force in enrolling as an adult learner comes from the desire to acquire more advanced qualifications in order to improve the learner's standard of living. Adult education comes with challenges for the learners and the teachers. The learners have time constraints, financial difficulties, societal and family commitments, the use of modern technology for learning, among others, as problems to contend with. The teachers of adults have to face the challenges of the overbearing attitudes of some learners as a result of the above mentioned problems.

Teaching adult learners can be very rewarding. The adult learners are focused and well determined. They bring in a wealth of knowledge and experience to class. All the teacher needs to do is to

tap into the positive aspects of adult learners, establish a good rapport, engage them in classroom discussions and bring out the best from them. The challenges of teaching adult learners can be overcome and well managed, by using the right methods to facilitate the teaching and learning sessions.

References

- Botswana, Republic of. (1977). *Education for Kagisano: Report of the national policy on education*. Gaborone: Government Printer.
- Botswana, Republic of. (1994). *The revised national policy on education*. Gaborone: Government Printer.
- Collins, M. (1991). *Adult Education as vocation: a critical role for the adult educator*. London: Routledge.
- Fry, H., Ketteridge, S., & Marshall, S. (2009). *Teaching and learning in higher education: enhancing academic practice*. London: Routledge.
- Jarvis, P. (1995). *Adult and Continuing Education: Theory and Practice*, (2nd. Edn.). London: Routledge.
- Knowles, M & Associates. (1984). *Andragogy in Action*. Houston, TX: Gulf Publishing.
- Marshall, C., & Rossman, G. (1995). *Designing qualitative research*. Thousand Oaks: CA: Sage.
- Moswela, B., & Iloanya, J. (2008, November). *Student empowerment in Botswana education*. iNet educator online conference paper.
- Onwuegbuzie, A. J., & Leech, N. L. (2006). Linking research questions to mixed methods data analysis procedures. *The Qualitative Report*, (11), 474-498. Retrieved January 12 2015, from: <http://www.nova.edu/ssss/QR/QR11-3/Onwuegbuzie.pdf>
- UNESCO. (1990). *Jomtien world conference on education for all*. Thailand, March 1990.

Additional Reading

- Kolb, D. (1984). *Experimental Learning*. Englewood Cliffs, NJ: Prentice Hall.
- Merriam, S. B and Brockett, R.G. (1996). *The Profession and Practice of Adult Education*. San Francisco: Jossey- Bass.

AN ALTERNATIVE MODEL TO PROFESSIONAL DEVELOPMENT IN MULTILINGUAL EFL CLASSROOMS: COOPERATIVE MANAGEMENT & RESIDUAL PRACTICE

Assist. Prof. Dr. Sibel Kaymakamoğlu & Assist. Prof. Dr. Çağda Kıvanç Çağanağa
European University of Lefke, Faculty of Education (Cyprus)

Abstract

Many higher education institutions worldwide require that all academic staff have a professional development plan. Teacher professional development has been regarded as one of the most important factors for improving the quality of both teaching and learning. Therefore it is imperative to use a solid framework evaluating professional development. This article aims to provide cooperative management as a comprehensive framework for evaluating the impact of professional development on classroom management. Cooperative management is a voluntary, collaborative process in which a school leader, a teacher and a professional colleague explore and reflect on learning and teaching practice. Specifically, the suggested model which emphasizes the dialectic process with a teacher, a school leader and a professional colleague represents that core features of effective classroom management is based on three aspects; the teacher, the school leader, and the professional colleague as feedback receiver and provider. In this study the designed model was implemented and the semi structured interviews were given to five EFL teachers who taught in multilingual classrooms as follow-up. The findings indicated that the suggested model helped the participant EFL teachers develop new perspectives in their classroom management strategies and contributed to their professional development. Furthermore, some implications were provided for school leaders as well as for teachers in Cyprus.

Keywords: *Cooperative management, professional development, residual practice*

1. Introduction

We argue that effective teaching contributes to effective learning in educational sciences. While teachers can learn and develop themselves, for the vast majority, teaching will make a significant impact on their classrooms, classroom management, and professional development. As Çağanağa (2014) suggests “teachers need to design educational experiences to produce desirable learning outcomes and provide opportunities for them to demonstrate their success in achieving their expectations”. We make the assumption that teachers employed to teach in different programmes will have sufficient knowledge for their teaching - but what of their knowledge of classroom management? How do they want to manage their classrooms and resources, and what facilities and resources are available to them in terms of their professional development? It is assumed that the more the teacher is experienced, the more s/he is good at classroom management. There is a close relationship between classroom management and professional development. This article tries to provide a new framework for both classroom management and professional development. A new model of classroom management is suggested in order to understand the existing teaching situations and desired requirements in classroom management and its impact on professional development.

The new model which is called *cooperative management* is a comprehensive framework for evaluating the impact of classroom management on professional development. Cooperative management is a voluntary, collaborative process in which a school leader, a teacher and a professional colleague explore and reflect on learning and teaching practice. Specifically, the suggested model which emphasizes the dialectic process with a teacher, a school leader and a professional colleague represents that core features of effective classroom management are based on three aspects; the teacher, the school leader, and the professional colleague as feedback receiver and provider. By reviewing the suggested model, we will examine whether it could be justified as a solid theoretical framework for evaluating classroom management. Although empirical research has been conducted for exploring the relationship between classroom management and teachers’ outcomes in Cyprus, to the best of our knowledge, there is no

literature which comprehensively describes three aspects which were shown above as a solid framework for evaluating classroom management. Therefore, this framework will help inform further evaluation studies of professional development and the evidence offered through this review of the research will help policy makers implement future professional development initiatives.

2. Cooperative management

Even though scholars have suggested diverse characteristics of effective classroom management, *cooperative management* has described *residual practice* as a core feature of effective classroom management. Similar ideas were supported by different writers with different names. For instance, in 1987, Donald Schon introduced the concept of reflective practice as a critical process in refining one's artistry or craft in a specific discipline. Schon recommended reflective practice as a way for beginners in a discipline to recognize consonance between their own individual practices and those of successful practitioners. As defined by Schon (1996), reflective practice involves thoughtfully considering one's own experiences in applying knowledge to practice while being coached by professionals in the discipline (Schön, 1996). The difference between reflective practice and residual practice is the interaction pattern. In this model, not only the individual and the successful practitioner's consonance but also the school leader's contribution is appreciated in order to examine the classroom practice in detail. This trio - the individual, the successful practitioner and the school leader - is explained in greater detail below along with the empirical research that serves as evidence of the impacts of each of the three members. The residual practice is the experience or practice left over at the end of the teaching process. The residual practice goes around five questions that the teacher is required to ask herself/himself; (1) What did you believe in? (2) What happened? (3) What's left over? (4) What would you do if...? (5) What will you do with what you learnt? In this learning process, both the successful practitioner and the school leader are expected to act as a feedback receiver or provider. The primary benefit of residual practice for teachers is a deeper understanding of their own teaching style and its impact on their classroom management. Another specific benefit may include the professional development process of teachers. Supovitz (2001) suggested that a logic behind professional development is that high-quality professional development will change teaching in classrooms, which will, in turn, increase student achievement. Moreover, recent literature has claimed that teachers' knowledge gained from professional development influences teaching practice (Blank & Alas, 2007; Yoon, Dun-can, Lee, Scarloss, & Shapley, 2007). Literature has identified and described an array of management approaches that teachers employ for their professional development. The cooperative environment that is required for the management would give the teachers a chance of sharing their reflective thoughts and thus help them achieve better management skills. Therefore it is believed that this dialectic process could contribute teachers develop professionally in teaching and learning.

3. Methodology

This study consisted of two phases. In the first phase of the research, the views of the participant teachers and the school leader about the existing professional development activities were sought. The second phase of the study focused on the participants' evaluations of the new model, cooperative management for their professional development. For this purpose, the following key research questions were designed: 1) What were the participants' views regarding the existing professional development activities? 2) What did participants gain from engagement with the new model, cooperative management process? For this investigation, purposively selected five novice EFL teachers and a school leader participated voluntarily. Prior to the investigation, the informed consent of the participants were taken. In the first phase of the study, the school leader's and the participant teachers' views regarding the existing professional development activities were sought by interviewing them. The interviews were semi-structured for the purpose of probing whenever needed and every participant was interviewed for 30 minutes. In the context of cooperative management model here, every participant teacher was asked to keep reflective reports daily. The participant teachers were also asked to keep notes based on their reflective reports, particularly about the classroom management issues and make a "dos and don'ts" list based on their classroom teaching experiences. Weekly meetings were held among the school leader and the teachers to receive and provide feedback to each other for the purpose of benefiting from the cooperative learning environment. During the meetings every teacher shared his/her notes based on the reflective reports she/he has taken with his/her colleagues and the school leader. This process took for 3 months. At the end of this period, as the second phase of the study, the school leader and the participant teachers were interviewed again to evaluate the new model, cooperative management for their professional development. The second interviewing was also semi-structured for probing purposes if

needed. The semi-structured interviews were recorded and later transcribed for the data analysis. The transcribed data were coded by using a broadly grounded approach (Strauss & Corbin, 1990) where the emerging categories were used for the purpose of comparison. I used a marginal note taking techniques (Patton, 2002, p. 463).

4. Results and discussion

4.1. First Phase: the participants' views regarding the existing professional development activities

Analysis of the data showed that all the participant teachers engaged into traditional professional development activities which did they did not seem to benefit from. They were required to attend the work-shops and seminars which were organized by some institutions or The Ministry of Education authorities. The emerged themes indicated that the existing professional development activities did not value them as individuals so they did not respond to their needs as practitioners. They also revealed the participants dissatisfaction with the existing professional development activities they engaged. It seems that most of the teachers needed more practical knowledge instead of theoretical knowledge. Janet explained: "I don't think the training sessions I attended resulted in any change in my teaching. The theoretical knowledge given in the work-shops and the seminars I have attended so far did not provide me practical ideas to solve the difficulties I face in class." According to Susan: "What I experience in class is important for me and every class differs. What I get in the seminars do not respond to the difficulties I experience." According to Olivia: "I find most of these sessions boring and time wasting. It is a kind of certificate collection procedure because I cannot find answers to the problems I face in teaching when I attend them." The analysis of the data also revealed another theme that in their work context the teachers were required to engage in conventional peer observation with their colleagues and they were not satisfied with it. The peer observation that they got involved in was limited to observing one peer termly and filling in a form to submit to the school leader. It seemed that the teachers did not find this very realistic for some reasons. They thought that it should have been more supportive and constructive rather than judgemental. They did not think that the existing observation scheme was suitable to address all the issues of teaching observation. Besides, they emphasized that the need for a collaborative feedback and sharing environment with colleagues and their school leader. According to Janet: "I see observation as ticking a form. The forms are filled in and later submitted to the school leader without discussing my views about my teaching. I don't find it fair." Susan explained: "We should observe more colleagues and discuss with each other the good sides and weak sides of our teaching. It shouldn't be so simple...just filling in and submitting the forms to the authority." Emma said: "Peer observation is something useful I believe...but you cannot learn from observing just once a term and I think it is not fair to judge a teacher just by observing once." Olivia stated that "I always feel nervous when I am observed because I am scared of getting a poor observation report. Evaluation of my teaching should have been different. I don't think one observation is enough. It doesn't change anything in my teaching." The problems in the existing system for the teachers professional development led to the design of the suggested professional development model, cooperative management.

4.2. Second Phase: evaluation of the new model, cooperative management

The analysis of the interviews conducted with the participants and the school leader revealed some important evidences for the benefits and satisfaction the participants experienced through the suggested new professional development model, cooperative management. Mainly the emerging themes were about the supportive nature of the process rather than judgemental; its positive contribution to their classroom practice; the cooperative environment with the colleagues and particularly with the authority (i.e. the school leader); the feeling of being responsible for self- development and as well as the colleagues. The participant teachers articulated that it was the first time that tried to keep reflective reports but they all emphasized their satisfaction with the process. They expressed how keeping reflective reports helped them become more self aware of their classroom practices and their needs related to teaching. They emphasized that this process enabled them to reflect, analyze and evaluate their practices critically which in turn had a positive impact on their classroom practices. Susan explained that "...at the beginning I found keeping reflective reports after every lesson tiring. So I kept a notebook to note down some key words later to go back to remember what happened in class during the day. After some time I realized that keeping a journal made me think about my classroom experiences in depth and developed a critical look to self." Similarly, Emily stated that "...writing down the things happened during teaching, trying to remember what happened in class made me become more aware of my practices and helped me think of the alternatives I can bring into my teaching." Emma's views were more focused on how the

reflective reports helped her during the discussions with her colleagues and the school leader in their regular weekly meetings. She said: "...keeping reflective reports guided me in our discussions and sharings with my colleagues and the school leader because I was more aware of the points I wanted to get feedback and help about." It has been realized that in order to understand peoples' behaviours it is essential to understand their thinking (Kaymakamoğlu, 2015, p.2). Therefore, when teachers engage into reflective thinking process, they can become more aware of their thinking and their actions in class.

The school leader expressed his views about keeping reflective reports as:

"...at the beginning I thought keeping a reflective report would put extra work on the teachers and that they would not continue to keep them regularly because of their heavy teaching loads yet it was surprising to see that every teacher enthusiastically did it. I think they found it meaningful because of the weekly meetings we held because they provided the basis of our discussions for giving feedback and receiving as getting feedback from each other."

All the participants valued the weekly meetings a lot. Their views were all for the positive impact of those meetings on their teaching. They expressed how the meetings provided them a supportive, constructive and positive sharing and learning environment. The meetings did not only provide them a discussion platform but also a social interaction atmosphere for contributing each others critical reflection and learning. Olivia stated that "...the meetings helped me to be in an environment where things are discussed openly without any hesitation that I would be evaluated negatively. We found such a nurturing environment to benefit from each other's views and experiences. I thought at the beginning having the school leader in those discussions would not benefit us but it worked just the opposite. The meetings were held in a very positive atmosphere. I used to be more nervous when I was peer observed because I always had the idea that the peer observation reports would be used for appraisal.

5. Conclusion

Successfully managing a school is crucial to the success of both the institution and the teachers. It is also crucial to the safety and understanding of processes and skills need for learning a foreign language in EFL classrooms. Research on teachers' beliefs, practices, and experience about teaching and classroom management will help teacher educators determine what experiences and knowledge included in foreign language education and professional development will best facilitate teachers' development of classroom management skills. Further research on the influences of cooperative management, such as the residual practice and collaborative process noted in this study, can provide an understanding of teachers regardless their experiences are supported in effectively managing their classroom and the ever-changing development of a teacher. These insights would be of value to teacher educators and school administrators in that they illustrate the need for administrative support in developing and implementing more dialectic process to support teachers. Findings from this study also provide insight for school leaders and teachers on management approaches that have been suggested with this study as being effective and how to go about implementing these approaches. Since this study examine a school leader's and five teachers' understanding and definitions of cooperative management to solve issues related to classroom management, it suggests the need for more extensive research on cooperative management approach in order to continue to examine links between their management style, understanding of classroom management, and teacher retention.

References

- Blank, R. K., de las Alas, N., & Smith, C. (2007, February). *Analysis of the quality of professional development programs for mathematics and science teachers: Findings from a cross-state study*. Washington, DC: Council of Chief State School Officers. Retrieved February 29, 2008, <http://www.ccsso.org/content/pdfs/year%202%20new%20final%20NSF%20Impde%20Fall%2006%20%20Report%20-032307.pdf>
- Çağanağa, Ç. K. (2014) Students' perceptions of learner-centred teaching in English for specific purposes in higher education Journal of Educational Research and Reviews Vol. 2(5), pp. 72-82, August 2014
- Kaymakamoğlu, S. E. (2015) A Study on EFL Teachers' Beliefs-Practice Relationship Regarding Gender, International Journal of in Trends in Arts, Sports and Science Education (IJTASE), vol.4, no.2.
- Patton, M. Q. (2002). *Qualitative Research and Evaluation Methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Schon, D A (1996) *Educating the reflective practitioner: Towards a new design for teaching and learning in the professions*. San Francisco: Jossey-Bass, Inc.

- Smylie MA (1995) New perspectives on teacher leadership. *Elem School J* 96:3–7
- Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage.
- Strauss, A., & Corbin, J. (1994).
- Supovitz, J. A.: (2001). Translating teaching practice into improved student achievement. From the capital to the classroom: Standards-based reform in the States. Fuhrman, S. (eds.).National Society for the Study of Education Yearbook Chicago: University of Chicago Press, Page: 81-98.
- Yoon, K. S., Duncan, T., Lee, S. W.-Y., Scarloss, B., & Shapley, K. (2007). *Reviewing the evidence on how teacher professional development affects student achievement* (Issues & Answers Report, REL 2007–No. 033). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southwest. Retrieved from <http://ies.ed.gov/ncee/edlabs>

PREPARING VOICE PROFESSIONALS AT FACULTIES OF EDUCATION USING APPLIED METHODS AND TECHNOLOGY

Lucie Šebková & Kateřina Vitásková

¹ Palacký University in Olomouc, Faculty of Education (Czech Republic)

Abstract

Research Aim: Educators and students of education programmes constitute a high-risk group of individuals where the existence of a problem with voice, or voice disorders, can possibly impact the complex performance of their profession. The incidence of voice disorders is high in these groups of voice users. Therefore, we need to emphasize the necessity of implementing preventive measures for voice disorders within the pre-gradual preparation, as well as the need for combining specific speech and language therapy techniques and technology assessing the quality of voice professionals preparing for their educational or special educational career. The principal aim of the partial research was to map students' interest in utilizing the method of measuring voice field and, concurrently, suggest the possibility of preventive therapeutic utilization of voice assessment technology in the students of the Faculty of Education. A partial aim was to detect the knowledge of prevention of voice disorders and to analyze the basic awareness of the strategies applied in case of voice disorders.

Keywords: *technology, education, university students, voice disorders, speech and language therapy*

1. Introduction

The ability to create (more or less naturally) voice representing a tool for creating speech is a very important characteristic feature of humans (Qian, Xudong, Mittal, & Bielamowicz, 2014). In professional terms, however, the ability to use voice adequately is much more important and serious, and especially not obvious. All professionals using voice as their main professional tool, therefore, face relatively strong pressure on the quality of their vocal expression, although they often realize this fact only in situations where their voice is weakened or affected by a significant disorder, the so-called dysphonia (cf. e.g. Jardim, Barreto & Assunção, 2007). The most serious problem that can possibly befall a voice professional is then the so-called aphonia, leading to complete loss of voice. In this case, aphonia de facto represents a professional failure because it prevents or severely restricts the direct exercising of the profession; in educators, it affects their natural impingement upon children, pupils or students, their communication with colleagues or parents. Voice professional (or professional voice user) is defined as "...an individual who depends on a consistent and appealing voice quality as the main tool in their employment" (Hazlett, Duffy, & Moorhead, 2011, p. 181).

From the viewpoint of education or special-education workers' impingement upon children, pupils or students, the specific characteristics of their voice (the so-called timbre or sonority, purity, etc.) are also important as they transmit information about the so-called nonverbal or melodic components of speech or components accompanying verbal expression. Sonorous, adequately strong, clear and pure voice of education workers satisfies the perfect idea about the basic professional preparedness for the vocally challenging teaching profession. Therefore, in some countries, many faculties of education also require a confirmation from doctors (specialists–phoniaticians) recommending or not recommending the prospective students of primarily teaching fields (but also non-teaching, e.g. speech therapy) as a mandatory part of the entry admission requirements (Vydrová, 2014). The ability of laying accent in speech, the descending or ascending melodic curve of sentences, the strength of voice during speech, i.e. the so-called prosodic speech factors, are the basis of the main information about the pragmatic importance of speech expression, including the mediation of communication emotional component. These are the speech components that refine, enhance or negate the content of statements, and their implementation would not be possible without adequate voice participation and functionality (Patel, Scherer, Björkner, & Sundberg, 2011). The presence of voice disorders in teachers may also negatively affect the performance of children in language tasks as it distracts them from the task content, disrupts their selective acoustic perception and subsequently their understanding of the content (cf. e.g.

Lyberg-Ahlander, Haake, Brännström, Schötz, Sahlén, 2015). Pedagogical workers should be able to actively control their voice and adapt to different learning environments and acoustic conditions; above all, however, they should be aware of the possible signs of voice disorders. Even better, the students of education fields should have the opportunity of identifying their voice difficulties and prevent the continuation or even worsening of such difficulties on the basis of being maximally objective as well as relatively affordable.

The incidence of voice disorders in the general population fluctuates between 6-15%, being up to 46% in the group of voice professionals (Martins, Pereira, Hidalgo, & Tavares, 2014; Vydrová, 2014). Data on the prevalence and incidence of voice disorders may be different. For example, this can be due to the concept of their definitions; these may determine the minimum number of experts-specialists needed to congruously (objectively) identify a specific voice disorder in the given individual based on sound perception and perceptual analysis of the client's voice. If it be to the contrary, it can relate to individual perception and self-identification of own voice problems in voice professionals (e.g. teachers) that may subsequently relate to a significantly lower prevalence based on the identification of voice difficulties by experts compared to nearly double the data on voice disorders perceived by the voice users themselves (cf. e.g. Scalco, Pimentel, & Pilz, 1996). Regarding the incidence of voice disorders in voice professionals- teachers, Higgins & Smith (2012) point to new data of a retrospective control study compared with a similar research by Roy, Merrill, Thibeault, Parsa, et al. (2004), evaluating the incidence of voice disorders among university teachers. In their opinion, the compared results refute the significant influence of behavioural and demographic factors on the development of voice problems. On the contrary, they think that the main determinant consists in educational requirements for using voice. From the perspective of differentiated voice demands on teaching workers, it is worth noting that the incidence of voice disorders in this group of voice professionals is above average compared to the typical population or non-teaching university staff; on the other hand, however, it is nearly twice lower than in teachers working in pre-school up to middle-school education institutions. The majority of teachers had difficulties, not serious but persistent and long-standing, in a degree that significantly interferes with their daily communication. Significant correlation between voice disorders or their symptoms in teachers, secondarily mildly to moderately restricting their continuous work performance, and incapacity to work was currently also confirmed by Giannini, Latorre, Fischer, Ghirardi & Ferreira (2015). Their study also points to the negative impact of poor acoustic conditions in the working environment of teachers, increasing the incidence of voice problems in this group of voice professionals (see also Cutiva Cantor & Burdorf, 2015 and others). At the same time, these authors also did not confirm the dependence of their voice disorders on demographic factors. In contrast to these predominantly Latin American research studies, the authors of a Swedish study, Ohlsson, Andersson, Södersten, Simberg & Barregård (2012), arrived at results pointing to the significant relationship of higher incidence of voice disorders (about 17%) in the group of students-future teachers, especially women, to certain factors that included organic voice problems in childhood or adolescence, frequent inflammatory diseases of the larynx, allergies associated with breathing difficulties, smoking, hearing difficulties, and, regarding functional influences, the previous practice of the teaching profession or leadership position, participation in leisure activities demanding voice use and previously undergone speech therapy or speech training.

The issue of prevention, diagnosis and treatment of voice disorders involves not only doctors but also speech therapists who, within the modern concept of implementing their profession, apply also advanced technology in the perceptual evaluation of voice quality, allowing visualization of individual vocal expression and subsequent analysis of voice characteristics (more in the American Speech-Language-Hearing Association, 2007, for example). Therefore, the respective contribution to enhancing the professional quality of future teachers and special education teachers also became the subject of our interest and the reason for initiating the verification of benefits that result from direct involvement of experts in voice disorders in their undergraduate university training. We would also like to point out the necessity of strengthening the competencies of future speech therapists in matters of objective assessment of voice quality and symptoms of voice disorders in confrontation with their subjective perceptual evaluation in relation to various study fields representing different future demands on the use of voice and professional voice load. At the same time, we proceed from the results of analyses and recommendations evaluating the current status of that preparedness of speech therapists to exercise their profession, which is part of that education or special education training in some countries (more in Georgieva, Woźniak, Topbaş, Vitaskova, Vukovic, Zemva, & Duranovic, 2015; Scharff Rethfeldt, W., & Heinzelmann, B., 2014, for example).

2. Methodology

The fundamental research method was chosen as a questionnaire, primarily aimed at verifying knowledge about the prevention of voice disorders in students of the teaching programmes at the Faculty of Education.

The items of the questionnaire ($n = 13$) assessed the knowledge of students about the risk factors of voice disorders, about the symptoms of voice disorders, the principles of vocal hygiene and harmful habits. Furthermore, the questionnaire examined what importance is attached to the prevention of voice disorders in relation to future occupation and whether the students would be interested in introducing oriented voice education in their training using visualization of the vocal expression.

The distribution of questionnaires was conducted electronically in the months of December 2014 to February 2015. Overall, the survey involved 143 students of the teaching programmes, 5 men and 138 women, with the mean age as 26.12 years.

3. Results and discussion of results

The first questionnaire item identified the risk factors of voice disorders that the students consider as the most (5) and the least (1) hazardous. Table 1 clearly shows that the most hazardous factors include smoking, frequent inflammation of the upper and lower airways, and shouting down. Allergies, stress, family problems and chalk dust are ranked among the significant factors influencing the emergence of voice disorders and elementary knowledge about the risk factors is essential for preventing voice disorders; the respondents, however, are less aware of them.

Table 1. Risk factors for voice disorders

Risk factors	1	2	3	4	5	Average
Allergies	21	54	49	17	2	2.48
Smoking	1	9	24	57	52	4.05
Upper respiratory tract infections	3	6	29	50	55	4.03
Hearing disorders	21	29	32	30	31	3.15
Noisy and dusty environment	3	20	22	49	49	3.85
Teaching profession	4	13	31	47	48	3.94
Shouting down	3	8	24	38	70	4.15
Poor acoustics	10	24	46	46	17	3.25
Stress	10	41	48	36	8	2.94
Family problems	35	47	46	14	1	2.28
Dust of chalk	24	49	40	21	9	2.59

Table 2 presents respondents' awareness of the symptoms of voice disorders. Underestimated symptoms of voice disorders include feeling of dryness in the throat, burning in the throat and reduced vocal range. Voice fatigue as a symptom of voice disorders should be more realized as it leads to congestion of the edges of the vocal cords, which can result in asymmetrical movement of the vocal cords, increase in phonation pressure and ultimately the formation of vocal cord nodules.

Table 2. Symptoms of voice disorders

Symptoms	Yes	I am not sure	No
Hoarseness	125	8	10
Voice fatigue	99	28	16
Aphonia	123	14	6
Burning in the throat	51	55	37
Reduced vocal range	59	36	48
Voice formed with strain	107	25	11
Breaks in the voice pitch	78	47	18
Feeling of dryness in the throat	35	39	69

The following two tables summarize the answers of the students (Table 3 and Table 4.) concerning harmful habits. The results show that the addressed students have less awareness about the harmful effects of whispering (when whispering, air leaks from between the vocal cords, engorging them), monotonous speech and breath-holding. Ignorance of the harmfulness of whispering for voice is

also evidenced by the results of answers to the following question: “What should I do instead of trying to shout down pupils in the class?” The most frequent answers of the students were: “I will drop my voice to a whisper.”

Although most students ($n = 104$) chose addictive cough as a harmful habit, the possibility of hawking (“I will hawk”) as a strategy for the so-called voice purification is used very often ($n = 63$). Conversely, yawning, which is recommended, is almost unused ($n = 9$).

Table 3. Harmful habits

Harmful habits	Answers
Addictive caughing	104
Whisper	54
Monotonous speech	12
Breath-holding	18
Loud speech	100

Table 4. Strategies for the so-called voice purification

Strategies for the so-called voice purification	Answers
I will hawk	63
I will yawn	9
I will swallow several times	34
I will drink water	117

Another questionnaire item assessed the significance the students attach to preventing voice disorders in relation to future profession. More than half of the students, 66%, consider the prevention of voice disorders in relation to future profession as very important, only 4% of the students consider the prevention as unimportant. When looking at the results of the answers to items related to the knowledge of and compliance with the principles of vocal hygiene, which is the primary factor in the prevention of voice disorders, we find that the students observe the principles of vocal hygiene only occasionally or minimally although they consider the prevention of voice disorders as very important (Table 5 and Table 6).

Table 5. Knowledge of the principles of vocal hygiene

Knowledge of the principles of vocal hygiene	Answers	Percentage
Yes	72	50 %
I am not sure	49	34 %
No	22	16 %

Table 6. Compliance with the principles of vocal hygiene

Compliance with the principles	Answers	Percentage
Minimally	30	21 %
On a long-term basis	22	15 %
Sometimes	79	55 %
I fail to comply	12	9 %

The last questionnaire item focused on the interest in using Voice Range Profile in training. 91% ($n = 130$) of the respondents were interested in active participation in the prevention of voice disorders within their university study. Due to the fact that the students are motivated to learn how to prevent voice disorders, the introduction of voice education in teaching future voice professionals can contribute to reduction in the prevalence of voice disorders in voice professionals, which is two to three times higher than in the general population. Voice education represents a low-cost but highly effective strategy of preventing voice disorders. The effect of voice education in students was investigated in the study titled *The Effect of Short Voice Training Programme in Future Teachers* (Timmermans, Coveliers, 2011). After implementing the training, the pursued students were able to extend their vocal range and vary their vocal expression, which is important for healthy future work with the voice apparatus.

4. Conclusion

Prevention of voice disorders requires the implementation of preventive measures before the problem arises. Emphasis should be placed on eliminating risk factors, recognizing the initial symptoms, avoiding underestimation of these symptoms, and seeking professional help. The results of the survey, which was attended by 143 students of the Faculty of Education, Palacky University in Olomouc, clearly show that the addressed students are aware of the significance of preventing voice disorders but their knowledge regarding the proper formation of voice, voice disorders and the principles of vocal hygiene acts interferentially with respect to the future occupation as a voice professional. It is important for the

students to be aware of the consequences of voice disorders that can have a negative impact on the quality of life as well as the economic impact in terms of job loss. Through this paper, we would like to highlight not only the negative impact of voice disorders for voice professionals but also the essentiality of primary prevention. We believe that the introduction of theoretically and practically oriented voice education into the training of future voice professionals, together with visualization of voice expression using the Voice Range Profile, is a very effective strategy for preventing voice disorders; we would like to use this strategy to innovate the training of students in the teaching courses at the Faculty of Education, Palacký University in Olomouc.

Acknowledgments

The research results constitute partial results of the specific research 'Research on selected communication disorders and deviations focusing on the specifics of speech therapy and hearing impairment assessment and intervention' (IGA_PdF_2015_024, principal researcher: Kateřina Vitásková).

References

- Patel, S., Scherer, K. R., Björkner, E., & Sundberg, J. (2011). Mapping emotions into acoustic space: The role of voice production. *Biological Psychology*, 8793–98.
- American Speech-Language-Hearing Association. (2007). Scope of Practice in Speech-Language Pathology. Available from: www.asha.org/policy.
- Cantor Cutiva, L. C., & Burdorf, A. (2015). Effects of noise and acoustics in schools on vocal health in teachers. *Noise & Health*, 17(74), 17–22.
- Georgieva, D., Woźniak, T., Topbaş, S., Vitaskova, K., Vukovic, M., Zemva, N., & Duranovic, M. (2015). Education of Speech and Language Therapists/Logopedists in Selected Central and Southeastern European Countries: Challenges and New Horizons. *Folia Phoniatrica Et Logopaedica*, 66(4/5), 183.
- Giannini, S. P., Latorre, M. O., Fischer, F. M., Ghirardi, A. M., & Ferreira, L. P. (2015). Teachers' Voice Disorders and Loss of Work Ability: A Case-Control Study. *Journal Of Voice*, 29209–217.
- Hazlett, D., Duffy, O., & Moorhead, S. (2011). Review of the Impact of Voice Training on the Vocal Quality of Professional Voice Users: Implications for Vocal Health and Recommendations for Further Research. *Journal Of Voice*, 25181–191.
- Jardim, R., Barreto, S. M., & Assunção, A. Á. (2007). Voice Disorder: case definition and prevalence in teachers. *Revista Brasileira de Epidemiologia*, 10(4), 625–636.
- Lyberg-A hlander, V., Haake, M., Brännström, J., Schötz, S., Sahlén, B. Does the speaker's voice quality influence children's performance on a language comprehension test? (2015) International *Journal of Speech-Language Pathology*, 17 (1), pp. 63–73.
- Martins, R. G., Pereira, E. N., Hidalgo, C. B., & Tavares, E. M. (2014). Voice Disorders in Teachers. A Review. *Journal Of Voice*, 28(6), pp. 716–724.
- Ohlsson, A., Andersson, E. M., Södersten, M., Simberg, S., & Barregård, L. (2012). Prevalence of Voice Symptoms and Risk Factors in Teacher Students. *Journal Of Voice*, 26629–634.
- Qian, X., Xudong, Z., Mittal, R., & Bielamowicz, S. (2014). Subject-specific computational modeling of human phonation. *Journal Of The Acoustical Society Of America*, 135(3), 1445–1456.
- Roy, N., Merrill, R. M., Thibeault, S., Parsa, R. A., Gray, S. D., & Smith, E. M. (2004). Prevalence of disorders in teachers and the general population. *Journal of Speech, Language, and Hearing Research*, 47, 281–293.
- Scalco, M. A. G., Pimentel R. M., Pilz W. (1996). A saúde vocal do professor: levantamento junto a escolas particulares de Porto Alegre, *Revista Pró-Fono*; 8(2): 25–30.
- Scharff Rethfeldt, W., & Heinzelmann, B. (2014). United in Diversity--das NetQues-Projekt zur Logopädieausbildung in Europa. (German). *Forum Logopädie*, 2(28), 28.
- Timmermans, B., & Coveliers, Y, at al. (2011). The Effect of a Short Voice Training Program in Future Teachers. *Journal of Voice*, 25(4), pp. 191-198.
- Vydrová, J. et al. (2014). *Hlasová a mluvní výchova pro pedagogy*. Praha: Medical Healthcom spol., s.r.o.

IBSE PROFILES-MODULES IN SCIENCE TEACHER EDUCATION

Josef Trna & Eva Trnova

Institute for Educational Development and Innovation, Masaryk University (Czech Republic, EU)

Abstract

Inquiry-based science education (IBSE) is currently rated as a promising educational method in science education. Science teachers need the development of specific IBSE teaching/learning methods, techniques and tools. Teacher education for the implementation of IBSE in instruction is not yet sufficiently provided. The objective of our research is the development of an IBSE teaching method, based on IBSE modules. The second objective is the implementation of this educational method into science teacher education. This research was conducted within the project PROFILES in the European 7th Framework Programme. The basic methods of our research were the design-based research, the curricular Delphi study and the case study. The output of the PROFILES curricular Delphi study is a set of concepts (paradigms) in science education which were used as the issue for our design-based research. The main outcome of our design-based research is the PROFILES-modules. These modules were used as the basis for training teachers in IBSE. Emphasis was given to the ownership of teachers and their creativity. Our case study described the role of teacher creativity, when teachers were members of project development teams creating new PROFILES-modules. These modules were verified by teachers in practice through their action research. The PROFILES-module "Safety of the human body: swimming and diving" is shown as a specific example.

Keywords: *IBSE, module, science education, teacher education.*

1. Introduction

Experts consider STEM (Science, Technology, Engineering and Mathematics) to be a crucial part of education for the current and future population. There is also expert consensus that science education should be a compulsory part of education for all children. It is necessary to consider what science education students should receive. In this context, we have to deal with the structure of the curriculum, educational methods and also motivation of students. Our students should acquire a set of skills including critical thinking, problem solving, cooperation, effective communication and self-education (Pellegrino & Hilton, 2012).

Educators have the task to develop effective educational methods which are appropriate for innovative teaching/learning science. Inquiry based science education (hereinafter IBSE) is considered a suitable method for science education. The core principles of IBSE are defined and known. Now it is necessary to deeper develop specific IBSE methods and tools for teaching/learning in school practice. Teacher education for the implementation of IBSE is crucial for effective application of this method. Experience shows that this teacher education is not sufficiently provided yet. We are trying to solve this problem within the project PROFILES (2014) in the European 7th Framework Programme. The results of our research, which addresses the issues of science teacher education, are presented in this study.

2. Rationales

Current science and technology is developing rapidly and strongly affects our everyday lives. It is necessary to prepare today's students for their interaction with new science and technology ideas and applications in the future. This new attitude involves competences important for successful day-to-day lives, referred to as "learning for life and work" and/or "twenty-first century skills". It is important to develop educational methods which are appropriate for the teaching/learning of science for all students. It is equally important to prepare effective science teacher education in the form of continuous professional development (herein after CPD).

Current science education prefers the design of instructional environments that involve students' scientific inquiry. Experts (Brown, 1990; Schwab, 1976) support teachers engaging their students in

pursuing answers to questions important in their lives. Engaging students in inquiry-based instruction dates back to Dewey (1938), who believed that students learn from their activities through extended experiences in real world problem-solving and discussion with others. This constructivist view of learning give theoretical support to teachers in facilitating students in developing their own knowledge through a process of interacting with objects in the environment and engaging in higher-level thinking and problem solving (Driver et al., 1994). Inquiry-based science education (hereinafter IBSE) is currently considered an appropriate method that matches the constructivist principles of science education.

There is a danger of IBSE being considered as narrowly as “hands-on science”, in which students carry out a series of separate hands-on activities that are unconnected to substantive science content and educational objectives. Inquiry-based teaching/learning strategies need to harmonize with theories of how children learn science, which include students revising their understanding through teachers building on students' experiences (Driver et al., 1994). The integration of socio-constructivist perspectives of learning with hands-on instruction enhances the opportunity for knowledge construction of inquiry (Rogoff, 1994; Solomon, 1989).

We tried to find a form of instruction that meets all the principles of IBSE. We developed this teaching/learning form within the frame of the European project PROFILES (2014). We also focused on educating teachers on IBSE.

3. Research questions and methods

We aimed to develop an IBSE special teaching/learning form (method), which meets all the principles of IBSE. Our first research question was:

What educational form of teaching/learning meets school practice and complies with the principles of IBSE?

The second objective of our research is the implementation of this developed teaching/learning method into teacher education. Our second research question was:

Can teacher training in IBSE affect their professional and personal development?

To address the research questions, we used three main research methods: the curricular Delphi study (Osborne et al., 2001; Bolte, 2008), the design-based research (Reeves, 2006) and the case study.

The curricular Delphi was developed within the PROFILES project. The main objective of this curricular Delphi study was to find out the views of different groups of respondents to the contents and objectives of science education in general as well as to engage them to express an opinion on IBSE and motivation. The Czech part of the PROFILES curricular Delphi study on science education was carried out in three rounds between the years 2011-2013. We questioned four groups of participants in the Czech Republic: 56 students (age 14-16), 30 science teachers (secondary schools), 28 science educators (university teachers) and 25 scientists.

Design-based research (hereinafter DBR) can be described as a cycle analysis of a practical problem, development of solutions, testing of solutions, reflection and implementation (Reeves, 2006).

In our case, DBR has the following form:

- (1) Analysis of practical problems: We identified the existing educational problems in the implementation of IBSE and teacher training.
- (2) Development of solutions with a theoretical framework: We developed a special teaching/learning form based on all IBSE principles – PROFILES-modules and created teacher training courses.
- (3) Evaluation and testing of solutions in practice: Science teachers (participants of PROFILES project) used action research for the implementation and evaluation of PROFILES-modules.
- (4) Documentation and reflection to produce “Design principles”: The final stage was the documentation and the establishment of new principles for the implementation of PROFILES-modules.

Our case study focused on qualitative research on the relationship between training teachers on IBSE and the development of their creativity. A case study of one chemistry and physics teacher (lower secondary school in the Czech Republic) was implemented in 2013 (Bolte et al., 2014).

4. Research results and discussion

The output of the PROFILES curricular Delphi study is three common concepts of science education:

- (a) Awareness of the sciences in current, social, globally relevant and occupational contexts in both educational and out-of-school settings
- (b) Intellectual education in interdisciplinary scientific contexts

(c) General science-related education and facilitation of interest in the contexts of nature, everyday life and living environment

More data can be found on the PROFILES (2014). The results in the form of these three concepts and relevant educational contents have been used as an issue in our following design-based research.

The main outcome of our DBR is the PROFILES-module as a core unit of IBSE. The PROFILES-module has been developed on a 3-stage model (Bolte et al., 2012):

(1) Initiation of the learning happens in a familiar and student-relevant situation when students identify with this situation and feel that it is within their sphere of action. Teachers stimulate students through a scenario. This is a narrative (story) based on everyday problems. It is designed to evoke interest and to raise questions in order to find answers.

(2) In the second stage the students' triggered self-motivation encourages them to be involved in the IBSE learning processes. Students realize their own inquiry-based learning cognitive activities.

(3) In the third stage, the students transfer their inquiry-based learning to the relevant socio-scientific situation encountered in the scenario and develop reasoned justification for decisions.

The PROFILES-module is based on motivation and a problem scenario. The scenario brings science-social issues to teaching/learning. The students create questions and problems which are solved with the use of their own inquiry. Structured and guided inquiry of IBSE is used. Students' experimentation is usually applied. Finally, the students return to the initial scenario through which they make decisions and recommendations. Formally, the PROFILES-module consists of materials for student activities and teacher guidance.

These PROFILES-modules were used as the core of teacher education as a part of their CPD. The teacher-trainees in the project were familiarized with the modules and their roles. Teachers implemented these PROFILES-modules into their teaching. In doing so, the teachers modified these modules and in the end they made their own PROFILES-modules. The PROFILES-modules were then verified by the teachers in practice through action research. Emphasis was given to teacher ownership and creativity. We aimed at the role of teacher creativity, where they were members of development teams creating new PROFILES-modules. Our PROFILES-module: "Safety of the human body: swimming and diving" may serve as an example:

Scenario: Death during diving

News from a TV broadcast: Yesterday the famous singer D.N. tragically died when scuba-diving at the seaside resort of H. A local police spokesman said that the exact cause of death would be clarified by means of autopsy ordered by the court. Senior instructor in diving L.T. answered our query as to what can cause a tragedy during diving - it may be a small injury, e.g. a ruptured eardrum. Details will be included in subsequent news.

In our case, students usually ask the following questions:

- *What properties of water can cause health risks or even the death of a person*
- *Which organs of the human body can be damaged during swimming and diving and why?*
- *What kinds of swimming and diving in the water are risky?*
- *Which rules of safe swimming and diving do we follow?*

The next step is students' activities where students research, seek information leading to a solution, discuss with peers in groups and perform experiments. Example of the experiment:

Experiment: Modelling of ear-drum rupture under high water pressure

Instructions for students' experimenting:

- *The basic experiment aid is a plastic bottle with a wide neck. The bottle cap is drilled and the valve of a tire is screwed into it. Overpressure in the plastic bottles in all experiments is done by hand-pressing or by a small velocipede tire-pump.*
- *Instruments in plastics bottles are fixed on stands made out of copper wire, a metal stick and wooden small plates (see Figure 1).*
- *Cover the mouth of the test tube with the rubber membrane (of an inflatable balloon) and secure with a rubber band. Connect the velocipede tire-pump to the valve and pump - you produce overpressure of air in the bottle. The membrane under the influence of pressure is bent into the test tube. The deflection of the membrane increases with increasing overpressure (Figure 2).*

Figures 1 and 2. Plastic bottle with a test tube covered by a rubber membrane



- Replace the rubber membrane with a thin plastic membrane. Under the influence of pressure it is also bent into a test tube (Figure 3). If overpressure in the bottle is sufficiently great, the plastic membrane ruptures (see Figure 4).

Figures 3 and 4. Plastic bottle with test tube covered by a plastic membrane



The rubber and plastic membranes simulate the behaviour of the ear-drum during swimming, bathing and diving. Water in the ear (ear canal) pushes on the ear-drum similarly to the air on the membranes in the case of our experiment. The result of this pressure is deformation of the eardrum and in the case of high pressure (overpressure) rupture of the ear-drum.

The third and the final phase is student decision making. In our case, students, using inquiry, came to the following conclusion:

- The deformational effect of overpressure force is demonstrated by the rupture of the covering membrane on the test tube made out of a piece of a plastic bag.
- The plastic membrane simulates the terminal behaviour of an ear-drum during swimming, bathing and diving. Water in the ear canal pushes on the ear-drum by a heavy force. The result is the rupture of the ear-drum. The implication of this rupture is acute pain and the loss of ability to find direction. This means a danger of death for the diver.

PROFILES-modules have an important role in the CPD of teachers. The project aims to improve the preparation of teachers in strengthening competencies in IBSE. The aim is also to motivate them and strengthen their ownership, as a prerequisite for the professional and personal development.

Our special research was focused on the development of the creativity of teachers as a significant personal and professional component and an important part of their CPD. According to Sternberg (1996) and Amabile (1996) a creative teacher is necessary to develop students' creativity. Teacher creativity is one of the core teaching factors. Quality development of teacher competences cannot exist without creativity. Our hypothesis is that high quality CPD is needed to develop teacher creativity. As creativity is a crucial factor in the multidimensional development of teacher professional competences, we examine the role of creativity in a number of partial dimensions within this development.

We investigate how the implementation, modification and creation of new modules affected the creativity of teachers. We conducted a case study of teacher-participants of Profiles CPD (Bolte et al., 2014). Creativity plays a decisive role in this development. As our case study documents, all creativity elements mentioned by Guilford (1950) were developed:

- Resourcefulness (the ability to create a wide flow of ideas): *The teacher herself demonstrated her development from self-efficacy from the CPD to teacher ownership of the PROFILES ideas evidenced by creating a new module.*
- Readiness, perceptiveness (the ability to modify ideas or jump from one idea to another): *The teacher was able to exhibit sufficient ownership of PROFILES ideas changing the form of experiments and worksheets according to changing conditions when testing out the new module.*
- Originality (unusualness of ideas): *The teacher created a completely original PROFILES module, which was still related to the underlying philosophy.*
- Imagination (production of ideas that are not obvious at first sight): *The teacher created a new PROFILES module "Carbon natural of life" with a difficult connection of the topic with daily life.*

- Endeavour (creativity is not only inspirational, but also hard work): *The teacher worked all the time with passion, alone and very hard.*

Our research has led us to conclude that the CPD can affect not only the development of professional competencies of teachers, but also the development of major components of their personality, including creativity. The outcomes of our research confirm that using the PROFILES-modules during CPD may cause positive changes in the development of teacher creativity.

5. Conclusions and implications

Based on the presented research outcomes, we have verified that the PROFILES-modules have two important roles:

- streamlining of science education students, with an emphasis on their motivation and activity
- development of teacher professional competences and personality

We have verified that current science education needs innovation. This suitable innovation is IBSE, which has strong motivational effectiveness because it arouses intrinsic motivation among students and supports them in learning about scientific inquiry and the nature of science. Similarly, we can conclude that the education of teachers for IBSE is a suitable method for their professional and personal development.

The results of our research should be implemented in the theory of science teacher education. In the preparation and implementation of training courses for teachers attention should be paid not only to innovative educational methods for students, but also to teacher professional and personal development.

References

- Amabile, T. M. (1998). *How to kill creativity*. Harvard Business School Publishing.
- Bolte, C. (2008). A Conceptual Framework for the Enhancement of Popularity and Relevance of Science Education for Scientific Literacy, based on Stakeholders' Views by Means of a Curricular Delphi Study in Chemistry. *Science Education International*, 19(3), 331-350.
- Bolte, C., Holbrook, J., Mamlok-Naaman, R., & Rauch, F. (Eds.). (2014). Science Teachers' Continuous Professional Development in Europe. Case Studies from the PROFILES Project. Berlin: Freie Universität Berlin (Germany) / Klagenfurt: Alpen-Adria-Universität Klagenfurt (Austria).
- Bolte, C., Steller, S., Holbrook, J., Rannikmae, M., Hofstein, A., & Naaman, R. M. (2012). Introduction into the PROFILES project and its philosophy. In C. Bolte, J. Holbrook & F. Rauch (Eds.). *Inquiry-based science education in Europe: reflections from the PROFILES project*. (pp. 31-42). Berlin: Freie Universität Berlin.
- Brown, A. L. (1990). Domain-specific principles affect learning and transfer in children. *Cognitive Science*, 14(1), 107-133.
- Dewey, J. (1938). The school and society. In M. Dworkin (Ed.). *Dewey on education*. New York: Teachers College Press.
- Driver, R., Asoko, H., Leach, J., Mortimer, E., & Scott, P. (1994). Constructing scientific knowledge in the classroom. *Educational Researcher*, 23(7), 5-12.
- Guilford, J. P. (1950). Creativity. *American Psychologist*, 5, 444-454.
- Osborne, J. F., Ratcliffe, M., Collins, S., Millar, R., & Duschl, R. (2001). *What should we teach about science? A Delphi study*. London: King's College.
- Pellegrino, J. W., & Hilton, M. L. (2012). *Education for life and work: developing transferable knowledge and skills in the 21st century*. Washington, D.C.: National Academies Press.
- PROFILES project. (2014). Retrieved November 1, 2014, from: <http://www.profiles-project.eu/>
- Reeves, T. C. (2006). Design research from the technology perspective. In J. V. Akker, K. Gravemeijer, S. McKenney, & N. Nieveen (Eds.), *Educational design research* (pp. 86-109). London, UK: Routledge.
- Rogoff, B. (1994). Developing understanding of the idea of communities of learners. *Mind, Culture, and Activity*, 4, 209-229.
- Schwab, J. (1976). Education and the state: Learning community. In *The great ideas today*. (pp. 234-271). Chicago: Encyclopedia Britannica Press.
- Solomon, J. (1989). The social construction of school science. In R. Millar (Ed.). *Doing science*. Great Britain: Falmer Press.
- Sternberg, R. J., & Williams, W. M. (1996). *How to develop student creativity*. Alexandria, Virginia: ASCD.

EDUCOLAND AS AN EXAMPLE OF LINKING EDUCATIONAL THEORY AND PRACTICE

Eva Trnova, Josef Trna & Jan Krejci

Institute for Educational Development and Innovation, Masaryk University (Czech Republic, EU)

Abstract

Science, technology, engineering and mathematics education (STEM) is the basis for the development of society. This education is now in crisis, because its popularity has been declining significantly. Much effort is devoted to finding the educational methods that could renew interest in the young Net-generation about science and technology. We must take into account the motivation of and professional support for teachers, because teachers influence education significantly. Teachers must be prepared to do this job and must have sufficient support. A serious problem is the gap between educational theory and practice. The objective of our design-based research is to bridge this gap by linking the university research community with school practical areas. Teachers intuitively develop teaching methods to achieve the desired educational outcomes. Researchers often discover a way to solve the practical problems of education, but due to their excessive professional level of communication they fail to transmit their ideas to teachers. The basic method of our research was the design-based research. The study presents our design-based research results of the professional support of science teachers with the use of an ICT vehicle in the form of the Web portal EDUCOLAND. The starting point was the analysis of teachers' needs linked to new research knowledge of university experts. The Web portal EDUCOLAND is created in cooperation with educational experts from Masaryk University and teachers from secondary schools.

Keywords: *connectivism, continuous professional development, science teacher education, Web portal.*

1. Introduction

The basis of the existence and development of society is science, technology, engineering and mathematics education (STEM) of citizens. However, the popularity of this education has declined significantly in many OECD countries and we even talk about a crisis of this education. Paradoxically, the crisis came at the time of the rapid development of information and communication technologies (hereinafter ICT), which strongly affects many spheres of everyday life. What we see now is a generation significantly affected by the massive use of ICT, called the NET-generation. The strong influence of ICT is also reflected in education. There are new pedagogical theories such as connectivism (Siemens, 2005), that bring pedagogical principles significantly different from the existing ones.

Teachers and experts on education look for adequate educational methods and tools that will meet the educational needs of the NET-generation. These needs are greatly influenced by the sceptical post-modernist approach to STEM. An important factor may also be considered the radical change in the ranking of life values of contemporary society with its focus on the comfortable consumer lifestyle.

Many studies have demonstrated (Crowther, 2009; Goodlad, 1994), that without high-quality continuous professional development (hereinafter CPD) of teachers, the education system cannot work well. Teachers need versatile support, which is based primarily on the acceptance of social principles of cooperation and trust among society, families and schools. The second area is the motivation of teachers for their hard work, which is dominated by salary, high-quality education management and school climate. The third major area is the continuous support of CPD of teachers (Bybee & Loucks-Horsley, 2000). Unfortunately, we still lack systematism and high quality in this education.

2. Rationale

Teachers must be appropriately prepared to do their difficult job and must have sufficient support. To improve the quality of education throughout the European Union it is necessary to support

CPD for teachers throughout their careers. It was recommended that all teachers should have ample opportunity to improve and update their knowledge, skills and competences (EU, 2008).

A serious problem of teacher professional preparation and all CPD is the gap between educational theory and school practice (Korthagen et al., 2001). The attempts to bridge the gap fail. At the same time there is unnecessary loss due to ineffective mutual communication between theory and practice. Practising teachers are often forced to deal with new unexpected problems intuitively without scientific knowledge. Experts on education look for and provide science-based solutions to many problems but they must be verified in practice. This could lead (and leads) to the situation where educational methods innovated by teachers and experts do not meet the current needs of the young generation (especially the NET-generation). The research sector is often not aware of the current needs of school practice and therefore deals with theoretical and often outdated research. At the same time valuable good-quality findings of experts do not get into teachers' practice in time, although they are necessary. We tried to improve this bad situation within our research with the support of the project EDUCOLAND.

3. Research questions and methods

The aim of our research is the attempt to bridge the gap between educational theory and practice. We assigned a research task to link school practice with research environment. We conducted wide-ranging research. We found a set of interconnected partial research problems and corresponding research questions, which include:

- How to motivate practising teachers to be interested in research outcomes and to apply them in practice?
- How to motivate experts on education to choose current issues from practice and to verify their effectiveness in practice?
- How to create communication channels for linking theory and practice between practising teachers and experts on education at universities?

New research problems should result in new research methods. A new research method that connects experts and teachers and therefore theory and practice has appeared. This research method is called design-based research and was founded by Reeves (2006). DBR with its developmental objectives and action-based goals differs from other types of research. The main advantage of DBR is its close systematic coherence with practical applications. The basic principle of DBR is the close cooperation of experts and teachers, which is a prerequisite for proper selection of research problems and subsequent validation and application of research outcomes in practice (Vanan den Akker et al., 2006). Precisely for this reason, we used DBR for solving our problem of linking theory and practice.

4. Research results and discussion

Our research was supported by the project Education for Competitiveness Operational Programme (ECOP). This project is based on linking university research (in our case, the Faculty of Education of Masaryk University) with teachers at schools (primary and lower secondary schools) in the region of South Moravia. The core solution of the project was the close connection between selected teachers of different subjects at schools and experts on subject education at universities. These teachers carried out diagnostics of teachers' professional needs and the requirements were passed to the experts at universities. The experts created programmes, modules, e-learning courses, study texts, learning aids etc. that were passed back to the teachers through a web portal. The materials were used primarily in teacher training and also for subsequent practical use in class.

The main means of communication is an interactive web portal EDUCOLAND managed by the university. Work outcomes of teacher candidates (often linked to practice) were also transmitted into practice. The university is the guarantor of quality and proficiency and sustainability of the project in the future. The main objective of the project was to create systemic CPD for teachers and other teaching staff throughout the complex spectrum of their professional needs with emphasis on:

- innovation of teaching/learning methods
- collecting and disseminating good examples from practice
- arranging international cooperation
- ICT use
- training techniques of developing students' literacy (scientific, technical, linguistic, ICT, financial, environmental etc.).

The current focus is kept on positive elements of the educational reform implemented in the Czech Republic. We would like to present a part of our research outcomes in this study that looked for a communication channel between theory and practice. The means of communication is the web portal EDUCOLAND (2014) which is presented briefly here. The homepage of the web portal EDUCOLAND (Figure 1) contains a number of components and the most important are the folders of individual subjects (left bar). There is a green arrow labelled Physics as an example.

Figure 1. Homepage of portal EDUCOLAND



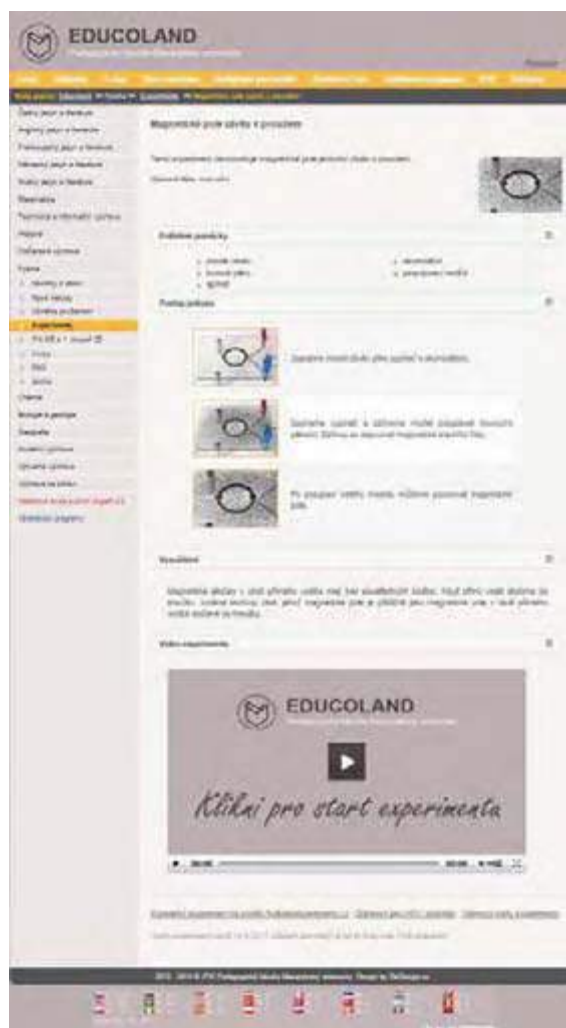
After selecting the appropriate subject folder, the structure of other subfolders appears (Figure 2).

Figure 2. Breakdown of PHYSICS folder

PHYSICS	
➤	News from the field of physics
➤	New educational methods
➤	Exchange of experience
➤	School experiments
➤	E-learning courses
➤	FAQ
➤	Archives

An example of the material from the folder "School experiments" we are presenting (Figure 3).

Figure 3. Example of material School experiments



In this folder with a physical experiment the teacher finds instructions on how to carry out the experiment: educational objective, list of instruments and materials, description of realization of the experiment, organisation of the experiment, photo of the experiment, video clip with the experiment, teacher guide of the implementation of the experiment into instruction etc.

Within our design-based research, aimed at bridging the gap between educational theory and practice, we came across the question of choice of educational contents – the curriculum, i.e. what the new NET generation of students should be taught. Our research has come to the conclusion that educational contents should be transformed and the main selection criteria for new contents should be in particular:

- (1) Up-to-date educational goals: they now focus on interdisciplinarity and application of knowledge in future careers and in real life
- (2) Compatibility with teaching methods: contents should be adequate for innovated educational methods (e.g. IBSE - Inquiry Based Science Education)
- (3) Reduction and updates: focus on key concepts and core issues, bringing science education containing redundant theoretical knowledge closer to everyday life

In our research we also asked for the opinions of teachers and experts on subject education with regard to their cooperation in project implementation using the portal EDUCOLAND (20014). The research method was a structured interview. We present the most common opinions of teachers and experts:

Teachers' opinions:

- cooperation with experts contributed to the increase of proficiency: "I got some news from my field"; "I learned new methods"
- communication with experts led to the application of theoretical knowledge in practice: "I'm trying new methods - it helped me to understand some pedagogical theories - I realized why it is necessary to change the approach to students"

- increased confidence thanks to cooperation with experts; willingness to participate in research: "I am interested in participating in research," I will not reject questionnaires, etc., I know it can help "

- understanding the importance of theoretical knowledge: "In the past I wanted completely practical things, I did not want to know anything about how to use them and why - today I understand the importance of theoretical knowledge"

Opinions of experts on subject education:

- clear presentation of research outcomes: "what should be used is "comprehensible" language for teachers"

- choice of practical research goals: "I must be interested more in practical issues, what to write about, issues that are most important for teachers"

- emphasis on linking theory and practice: "in addition to basic research, it is necessary to implement applied research, I found out that I was detached from reality - I do not know what is going on at schools today"

- new different perspective on teachers: "mutual cooperation with teachers in research is possible and beneficial"

Based on interviews with teachers and experts on subject education, we can conclude that mutual cooperation was beneficial for both groups. The vast majority of teachers reported that before this project they had not studied either the results of educational research or any professional educational publications, mostly because they did not understand them and considered them unnecessary. They had never thought of implementing research in class by themselves and testing the effect of methods on students etc. They usually changed methods intuitively. Experts on subject education realized that if their research results were to be used by teachers in practice, they should use comprehensible language. We found out that in an appropriate environment both groups cooperated very actively.

5. Conclusions and implications

We tried to resolve the educational problem of the gap between theory and practice. This gap arises because practising teachers at schools and experts at universities differ in their views on education. We did not look for reasons for the emergence of this gap, but ways of overcoming it. We used the method of design-based research, which is inherently close to the link between research and practice and connects experts on education and teachers. We developed a communication tool between theory and practice, which is the web portal EDUCOLAND connecting teachers in the region with its research department at university. Our ambition in the future is to look for common areas where theory and practice can meet in common solutions of educational problems. A current challenge is to create a functional system of CPD, retraining professionals who decide to enter the teaching profession.

References

- Bybee, R. W., & Loucks-Horsley, S. (2000). Advancing technology education: The role of professional development. *The Technology Teacher*, 60(2), 31-34.
- Crowther, F. (2009). *Developing teacher leaders: How teacher leadership enhances school success*. Corwin Press.
- EDUCOLAND (2014). Retrieved October 12, 2014, from: <http://educoland.muni.cz/>
- EU (2008). Retrieved October 4, 2014, from: <http://www.europarl.europa.eu/search/highlight.do?hitLocation=http://www.europarl.europa.eu/sides/getDoc.do%3Ftype%3DREPORT%26reference%3DA6-2008-0304%26format%3DXML%26language%3DCS>
- Goodlad, J. I. (1994). *Educational renewal: Better teachers, better schools*. San Francisco: Jossey-Bass Inc., Publishers.
- Korthagen, F. A., Kessels, J., Koster, B., Lagerwerf, B., & Wubbels, T. (2001). *Linking practice and theory: The pedagogy of realistic teacher education*. London: Routledge.
- Siemens, G. (2005). *Connectivism: A Learning Theory for the Digital Age*. *Elearnspace*. Retrieved March 20, 2014, from: <http://www.elearnspace.org/Articles/connectivism.htm>
- Reeves, T. C. (2006). Design research from the technology perspective. In J. V. Akker, K. Gravemeijer, S. McKenney, & N. Nieveen (Eds.), *Educational design research* (pp. 86-109). London, UK: Routledge.
- Vanan den Akker, J., Gravemeijer, K., McKenney, S. & Nieveen, N. (2006). *Educational design research*. London: Routledge.

UNDERSTANDING TEACHER EDUCATORS' PEDAGOGICAL AND TECHNOLOGICAL CULTURAL HABITUS (PATCH) IN THE MALDIVES

Aminath Shafiya Adam

Faculty of Education, University of Waikato (New Zealand)

Abstract

The literature widely discusses the complexity of integrating technology in teachers'/teacher educators' pedagogies, overlooking the impact of professionals' culture when investigating their use of technologies in their practices. Bourdieu (1977) argues that people's practices are embodied within their cultures; hence they form habitus through their past and present experiences both consciously and unconsciously. This paper argues that technological and pedagogical practices of professionals cannot be fully understood without considering their social and cultural norms of their specific cultures. This research was designed through an ethnographic approach linked with Bourdieu's (1977) habitus as a lens for exploring teacher educators' practices in the Maldives. The data was gathered from eleven teacher educators through interviews, observations, focus group discussions, and the hanging out activities in a Maldivian university context. The findings were generated using various strategies adhering to grounded theory for capturing an in-depth understanding of how teacher educators shaped their pedagogies. The paper presents two cases out of eleven teacher educators who participated in this research. Key findings demonstrated that teacher educators' technological and pedagogical practice was influenced by their own culture, early learning experiences (social cultural), and their workplace (institutional culture). More specifically, the study indicated that teacher educators formed technological (PowerPoint-assisted) and pedagogical (content-oriented) cultural habitus by the influence of their social cultural norms in the Maldives. This study offers new theoretical understanding related to the impact of deep-seated cultural and context aspects on professionals' practices and their use of technologies both in schools and university contexts.

Keywords: *Teacher educator, pedagogical practice, technology use, habitus, Maldives*

1. Introduction

The literature on the Maldivian contexts, suggests that teaching in Maldivian classrooms is concentrated on rote learning and memorising both facts and content. Mohamed (2006) argued that the Maldivian schools are examination-oriented and teacher talk-time was remarkably high. Shareef (2010) confirmed this by observing a focus on transmitting knowledge in the Maldivian classrooms. In a more recent study, Kinaanath (2013) asserted that traditional pedagogy is not only rooted in the school systems but also in the higher education contexts. He described the pedagogical practice as a traditional "chalk-board-talk" practice (Kinaanath, 2013, p. 174). A part from the traditional schooling, the cultural practice of learning recitation of the *Qur'an* without understanding the meaning of the manuscript is largely related to children's education in the Maldives (Duch, 2005). This 'in turn' could play an important role when understanding the meaning of learning and teaching in this particular context. These researchers' arguments draw attention to the importance of understanding the influence of culture when investigating teacher educators' use of digital technologies in the Maldives. This paper aims to explain the impact of Maldivian culture on teacher educators' formed pedagogical practice.

Many researchers suggest that pedagogical practice with digital technologies must be more than just the transmission of knowledge through the teachers' use of these tools (Boshuizen & Wopereis, 2003; Pritchard, 2007; Webb, 2013). These studies provide useful ideas for exploring teacher educators' conceptualised pedagogy in the Maldives, specifically in terms of how they teach, what tools they use, and the approaches they use for teaching. However, it must be noted that these studies pay very little attention to the impact culture has on teachers' use of digital technologies. Instead, they merely concentrate on teachers' and students' roles when using these tools, whilst overlooking the influence of teachers' culture and their backgrounds on their shaping of pedagogical practice with digital technologies.

A decade ago, Scott, Chovanec, and Young (1994) claimed that pedagogical practice is very likely to be linked to an individual's personal philosophy. They report that participants who believed in

teaching as delivering knowledge were influenced by their own philosophies of delivering knowledge, and eventually their teaching role was seen as expert, which was inevitably translated into their practices. In Scott et al.'s study, participants were professors in a Canadian university context, and regardless of their range of experience in teaching, their practices remained teacher-centric due to the influence of their backgrounds. Given that this study is not about professors' use of technologies but their pedagogical strategies being influenced by their own backgrounds for a relatively long time, it clearly underpins the strong impact of background on people's practices in teaching. Grasha and Yangerber-Hicks (2000) argue that learning and teaching is part of an individual's personal make-up. This means how people learn or teach relies on individual experiences, their emotions, needs, beliefs, motives, and attitudes towards teaching and learning. In this study, regardless of participants being college lecturers, their use of computers and the Internet resources were influenced by their own backgrounds. Grasha and Yangerber-Hicks raise a major concern regarding the need for lecturers developing a conceptual rationale for using technologies. This particularly relates to how their use of technologies fits with their teaching philosophies. Their finding suggests that lecturers' backgrounds influence the way in which they embrace the philosophy of teaching, and accordingly determines how they use technologies in that regard.

Educational technology researchers draw attention to teachers' backgrounds being influenced by how they use digital technologies in teaching. Sipilä (2010) in a Finnish school context, he argues that teachers' pedagogical practices demonstrated the same style regardless of their use of technologies. His findings suggest that teachers' pedagogy will not change because "ICT[Information and Communication Technology] itself does not necessarily trigger change" (Sipilä, 2010, p. 4). Perkins (2012) points to an example in India, where factual knowledge-based teaching and standardised examination oriented practice is being established, suggesting that the uptake of technology is unlikely to bring pedagogical change. Furthermore, Perkins (2012) explains that teachers' pedagogical dispositions encompass the traditional content-oriented teaching that was already established in teachers' pedagogies prior to the advent of technologies. In such contexts, technology does not seem to fit with constructivist learning. Therefore, collaborative and interactive based activities are sparingly employed, regardless of whether or not teachers use technologies in such contexts. These researchers suggest that teachers' early teaching habits could play an important role when designing teaching with digital technologies. Although these researchers raise concerns regarding the way teachers used technologies in teaching, their emphasis was rather on understanding teachers' existing pedagogical practice without necessarily attempting to understand what had happened in teachers' backgrounds and past experiences. In other words, none of these studies focused on understanding how teachers' specific pedagogical philosophies formed or how their philosophies influenced their use of technologies in teaching.

At about the same period, Adams (2012) investigated college instructors' and students' use of PowerPoint in Canada. She argues that the use of PowerPoint in pedagogical practice often relates to student passivity. PowerPoint changes the classroom to "a cinematic space" (p. 147), where the teacher takes the role of orator or narrator of the PowerPoint and students passively watch and listen to what the teacher narrates. This links to traditional teaching methods, which mainly replace the black/white board. More recently, Kurt (2013) reveals that teachers' use of PowerPoint mostly supports their traditional teacher-directed teaching methods in a Turkish school. This suggests that a different technology, such as IWB, may have the same role when teachers use it in teaching. Bang and Luft (2013) investigated beginning teachers' use of technology over a five-year period in an American school context. Their findings from interviews and observation data indicate that the most frequently used tool is PowerPoint, and it was used by teachers mostly for supporting traditional teaching methods. These arguments draw attention to the traditional pedagogical practice as being tied to teachers' use of technologies in their existing pedagogies. As these studies' findings are generated from technology-rich contexts, such as the United States of America and Canada, it is essential to understand the reasons behind teachers' adoption of PowerPoint and the associated traditional teaching with this particular tool. None of these studies explain participants' backgrounds and how these may have influenced the adoption of PowerPoint and how it is used in teaching. The literature also suggests that often teachers' early established practices and pedagogical thinking may influence the way they use technologies in teaching. According to Koehler and Mishra (2008), technology introduces additional variables to the learning and teaching context that demand teachers change their practices, which eventually adds double complexity to their pedagogical approaches. This double complexity is represented in terms of marrying teachers' use of digital technologies with their pedagogical approaches. When synthesising the studies above, what is still unclear is the reason for teachers adopting certain tools or forming certain pedagogical practices. In the context of my research, where digital technologies have only been introduced in the 2000s, the way teacher educators use digital technologies may mirror issues similar to those examined by the above researchers. However, it is yet not clear why teachers do what they do when teaching with various technologies.

2. Research Design

This study adopted an ethnographic methodology to investigate how teacher educators' use of digital technologies in their pedagogical practices was formed in the Maldives. The ethnographic methodology considered two focuses: 1) to understand the natural milieu (teacher education context) of the teacher-educators' existing pedagogical practices. 2) To understand the connection between teacher educators' early background and their later formed practices. Reeves, Kuper, and Hodges (2008) argued that ethnographers' engagement and involvement with the natural setting is necessary. This 'in turn' allows ethnographers to provide thick descriptions about individuals' social context (Geertz, 1973).

Prior to conducting this research, the ethical approval from the University of Waikato was sought and granted on 5th May 2011. In a teacher education institution, located in the Maldives, eleven teacher educators were approached depending on their interests and familiarity with digital technologies. In order to gather data, I visited the research site twice: once at the beginning of 2012 and again in 2013. In the first visit, I interviewed eleven teacher educators individually and "hung out" (spent time with them during their work hours) with them for about six weeks. Hanging out is a term used to describe ethnographers' field experiences and their involvement with the participants during the field work (Bloor & Wood, 2006). After generating a preliminary analysis, I observed classroom teaching of six participants, which enabled me to link the teacher educators' shared comments in their interviews with their actual practices. In the second visit, eleven months later, I organised focus group discussions on issues generated from the preliminary findings. Lastly, I had individual follow-up interviews with five teacher educators to cross-check my main understanding of their formed practices. Out of eleven participants, the paper briefly presents a summary of two teacher educators' vignettes to demonstrate the key findings.

3. Research Findings

3.1. Shaina's Case (Influence of culture and background)

Shaina grew up in a middle class family. As she did not go to a formal school, she explained little about her schooling experiences. However, she shared many examples of her learning experiences at home and other special classes (not formal schooling). She completed bridging courses to start her teaching career. After obtaining certificate level courses in the Maldives, she initially worked as a teacher in a school. After ten years of experience, she gained her first degree and became a teacher educator where she is currently working. Shaina had early interaction with technologies, such as movie cameras and musical instruments. However, her first experience of using a computer was when the computers were introduced at her workplace in the mid-2000s. She had struggled using computers at the beginning; however, because of her love for technology, she later became very adept in using computers. Shaina's approaches of teaching and her conceptualised roles as a teacher were very much influenced by her grandmother as a role model. Her grandmother taught her recitation of the *Qur'an* without making it meaningful. Understanding the meaning was not given any emphasis in this learning experience, rather memorising and rehearsing the texts. The extracts from her data showed connections between her early learning experiences and the practices formed later. In conclusion, Shaina, saw learning as the same as rehearsing knowledge without it necessarily having meaning for the learner. Moreover, she saw teaching as delivering content and helping students to store it in their minds through her use of PowerPoint. Shaina used PowerPoint presentations to help learners rehearse the content she taught. This process directly mirrors her childhood learning in reciting the *Qur'an*. Shaina's experience highlights a common theme among participants: what they understand (and practice) learning to be like.

3.2. Nisha's case (Influence of context and background)

Similar to Shaina, Nisha had the experience of learning recitation of the *Qur'an* when she was young, coupled with the traditional schooling in the Maldives. However, Nisha completed her undergraduate and graduate studies overseas. She had experience of teaching in a school prior to becoming a teacher educator. Nisha had used computers during her schooling, and was fascinated with technology's potential for her teaching, having used technology for her own learning. Thus, she believed it could help students to learn as well as make her teaching better. However, Nisha's pedagogical practice was influenced by her institutional context. Nisha often discussed different pedagogical approaches and their suitability for her teaching context. She believed that explaining the content knowledge was important for her students as they needed to sit examinations later on. Through this view of practice, Nisha helped her students to receive and rehearse knowledge, rather than helping them to construct it. The extracts drawn from later phases (focus group discussion and follow-up interview) of data collection supported my contention regarding her formed practice. The influence of the pedagogical context was

apparent in Nisha's formed practice. Her beliefs regarding the importance of content for her students, her efforts in preparing them for examinations, her commitment in following the policies that are established in her workplace influenced her shaped practice. My argument regarding the influence of pedagogical context was clearly demonstrated in Nisha's views on her role as a teacher, her selection of specific technological tool (PowerPoint), and her principles of teaching. Nisha experienced the pressure of her context of practice on her teaching approach, and the pressure of heavy content modules, 50 percent of assessment policy (summative assessment at the end of the term), students' expectations regarding explanation of the content, and social pressure on students' performance. These factors heavily influenced Nisha's pedagogical practice in terms of selecting PowerPoint as a main tool and her approach to teaching through it.

4. Discussion and conclusion

Understanding Maldivian teacher educators' formed practice through habitus lens helped me theorise the strong connection between educators' culture and their pedagogical practice with digital technologies. The literature clearly outlines the strong relationship between pedagogy and people's culture (Cheng, Cheng, & Tang, 2010; Gay, 2010; Kansanen, Tirri, & Meri, 2000; Kukari, 2004). These researchers draw attention to the importance of understanding individuals' culture when explaining their pedagogical practices. For example, Gay (2010) argued that often people's values, beliefs, insights, roles and responsibilities are derived from their culture. It is therefore, understandable that judgements and decisions made by teachers are associated with their cultures. I argue that teachers' dispositions are deeply embedded in their cultural habitus. It is noteworthy that though teacher educators in my research were individually different, their common culture largely influenced their pedagogical and technological practices. Culture in this sense can include teachers' own backgrounds (such as learning recitation of the *Qur'an*), and the influence of the context where they teach (education system). For example, Shaina's cultural habitus represented the strongest impact on her shaping of specific practice. It shows that the cultural practice related to learning recitation of the *Qur'an* in the Maldives and her early learning experiences influenced the formation of a dominant cultural habitus for Shaina. Specifically, this was because she valued highly her grandmother's teaching and the teaching of the *Qur'an*. Shaina's approaches to teaching was emphasised on delivering content knowledge (pedagogical) and her selection of PowerPoint (technological) was based on its suitability for delivering content to her students. Similar to Shaina, Nisha had the same experience of learning recitation of the *Qur'an* coupled with her rote learning experiences in Maldivian schools. As she studied overseas (the USA, and Australia), Nisha had learning experiences through various technologies during that education. When she returned to the Maldives, she tried to implement what she learned in her early career of teaching. However, her pedagogical experiences made her decide that her expectations of student learning were not met. According to Nisha, neither her students' expectations of her role as a teacher were satisfied nor were her expectations of her students' learning met when she taught through interactive strategies. Nisha found that her students did not learn much when they were given activities designed to construct their own understanding. For her, the meaning of learning was then re-defined as the storing of knowledge in her students' minds, perhaps by the influence of deep-seated value given to the knowledge to be rehearsed and replicated, rather than to be constructed. In other words, her pedagogical practice was centred on students receiving and memorising the content she taught. Therefore, the focus of her pedagogy was delivering content through her use of PowerPoint.

The cultural habitus became dominant in both of these teacher educators' later practices. I was able to grasp this understanding while synthesising the elements of both Shaina's and Nisha's formed practice through Bourdieu's habitus lens. Bourdieu (1977) argues, that teachers' culture including their working context can become a strong 'field' where individuals' dispositions are shaped through a socialisation process. The socialisation process is one in which teachers conceptualise their pedagogical practice with technologies. The facilities available (economic capital) in the teachers' workplace or their cultural upbringing (social and cultural capital) can become a large part of their formed dispositions. Literature suggests that teachers learn their practical pedagogical knowledge as they continue teaching in the context of practice (Loughran & Northfield, 1996). The influence of teachers' own culture and the context, therefore, cannot be ignored in an analysis of their pedagogical practices. Teachers decide their pedagogical strategies based on their own understanding of what it means to teach and how it would suit their context of practice (Barton & Berchini, 2013). Findings of this study indicated that there is a strong connection between teacher educators' early background and how they used digital technologies in teaching in the Maldives. My theorisation of teacher educators' pedagogical (approaches to teaching) and technological (technology uses) cultural habitus (PATCH) may help researchers not only examine teachers' use of technologies in teaching, but also identify what to address and which areas to focus on when change is necessary in order to enhance pedagogical practices with technologies.

References

- Adams, C. (2012). PowerPoint and the pedagogy of digital media technologies. In M. Orey, S. Jones & R. M. Branch (Eds.), *Educational Media and Technology Yearbook* (Vol. 36, pp. 49-65). New York, NY: Springer Retrieved from http://dx.doi.org/10.1007/978-1-4614-1305-9_5. doi: 10.1007/978-1-4614-1305-9_5
- Bang, E., & Luft, J. A. (2013). Secondary science teachers' use of technology in the classroom during their first 5 years. *Journal of Digital Learning in Teacher Education*, 29(4), 118-126.
- Barton, A. C., & Berchini, C. (2013). Becoming an insider: Teaching science in urban settings. *Theory into Practice*, 52(1), 21-27. doi: 10.1080/07351690.2013.743765
- Bloor, M., & Wood, F. (2006). *Keywords in qualitative methods: A vocabulary of research concepts*. London, England: Sage.
- Boshuizen, H. P. A., & Wopereis, I. G. J. H. (2003). Pedagogic benchmarks for information and communications technology in teacher education. *Technology, Pedagogy and Education*, 12(1), 149-159. doi: 10.1080/14759390300200150
- Bourdieu, P. (1977). *Outline of a theory of practice*. Cambridge, England: Cambridge University Press.
- Cheng, M. M. H., Cheng, A. Y. N., & Tang, S. Y. F. (2010). Closing the gap between the theory and practice of teaching: Implications for teacher education programmes in Hong Kong. *Journal of Education for Teaching*, 36(1), 91-104. doi: 10.1080/02607470903462222
- Duch, H. (2005). Consultation in international development: The case of early childhood in Maldives. *School Psychology International*, 26(2), 178-191. doi: 10.1177/0143034305052912
- Gay, G. (2010). Acting on beliefs in teacher education for cultural diversity. *Journal of Teacher Education*, 61(1-2), 143-152. doi: 10.1177/0022487109347320
- Geertz, C. (1973). *The interpretation of cultures* (Vol. 5019). New York, NY: Basic books.
- Grasha, A. F., & Yangarber-Hicks, N. (2000). Integrating Teaching Styles and Learning Styles with Instructional Technology. *College Teaching*, 48(1), 2-10. doi: 10.2307/27558972
- Kansanen, P., Tirri, K., & Meri, M. (2000). *Teachers' pedagogical thinking : Theoretical landscapes, practical challenges*. New York, NY: Peter Lang Publishing.
- Kinaanath, M. (2013). *The use of information and communication technology in teaching and learning within higher education sector of a small island developing state: The case of the Maldives*. (Doctor of Philosophy), Victoria University, Wellington, New Zealand. Retrieved from <http://hdl.handle.net/10063/2977>
- Koehler, M. J., & Mishra, P. (2008). Introducing TPACK. In AACTE (Ed.), *Handbook of technological pedagogical content knowledge (TPCK) for educators* (pp. 3-29). New York, NY: Routledge/Taylor & Francis Group.
- Kukari, A. J. (2004). Cultural and religious experiences: Do they define teaching and learning for preservice teachers prior to teacher education? *Asia-Pacific Journal of Teacher Education*, 32(2), 95-110. doi: 10.1080/1359866042000234205
- Kurt, S. (2013). Examining teachers' use of computer-based technologies: A case study. *Education and Information Technologies*, 18(4), 557-570. doi: 10.1007/s10639-012-9199-7
- Loughran, J., & Northfield, J. (1996). *Opening the classroom door: Teacher, researcher, learner*. London, England: Routledge.
- Mohamed, N. (2006). *An exploratory study of the interplay between teachers' beliefs, instructional practices and professional development* (Doctor of Philosophy), University of Auckland, Auckland, New Zealand. (1924)
- Perkins, R. (2012). Are most investments for technology in schools wasted? *TechTrends*, 56(1), 10-11. doi: <http://dx.doi.org/10.1007/s11528-011-0548-y>
- Pritchard, A. (2007). *Effective teaching with internet technologies: Pedagogy and practice*. London, England: Sage.
- Reeves, S., Kuper, A., & Hodges, B. D. (2008). Qualitative research methodologies: Ethnography. *British Medical Journal*, 337(7668), 512-514. doi: 10.2307/20510696
- Scott, S. M., Chovanec, D. M., & Young, B. (1994). Philosophy-in-action in university teaching. *Canadian Journal of Higher Education*, 24(3), 1-25.
- Shareef, M. (2010). *Environmental education in the Maldives: The implementation of inquiry-based learning at the primary level*. (Masters of Education), Unitec Institute of Technology Auckland.
- Sipilä, K. (2010). The impact of laptop provision on teacher attitudes towards ICT. *Technology, Pedagogy and Education*, 19(1), 3-16. doi: 10.1080/14759390903579257
- Webb, M. (2013). Changing models for researching pedagogy with information and communications technologies. *Journal of Computer Assisted Learning*, 29(1), 53-67. doi: 10.1111/j.1365-2729.2011.00465.x

HOW BLACKBOARD E-LEARNING TOOL AFFECTS INTERMEDIATE CHINESE SPEAKING AND LISTENING COURSE

Tungyue Hon

Yale-China Chinese Language Centre, The Chinese University of Hong Kong, Hong Kong SAR (China)

Abstract

In the 21st century, computer technologies have developed at a tremendous pace. With the impact of technological development, the method of teaching Chinese at the Chinese University of Hong Kong (CUHK) has changed massively during the last decade. Classroom teaching has shifted from blackboard and chalks to overhead projectors and computer-aided programs. Students attend language laboratories in addition to meeting teachers face to face; students use electronic devices to search for definitions of new words, take photos of notes and handouts, record lectures, and download sound files for listening and practice.

Teachers teaching Chinese as a second language use smart search engines and databases on the Internet to collect, edit, and upload contents to automatically generate teaching materials, thus combining methodology and curriculum with computer technologies to manage teaching online. This study mainly focuses on how Blackboard, an e-learning tool, is applied in our Intermediate Chinese Speaking and Listening Course, particularly on how it manages and supervises students' paces of study, and how it coordinates with teachers' classroom teaching. This paper also addresses feedback from students on their perspectives of comprehensive computer technologies employed in teaching Chinese as a second language, and the reflections of teachers towards teaching with Blackboard.

Keywords: *Blackboard, E-learning tool, speaking and listening course*

1. Introduction

Since autumn term 2013, the Yale-China Chinese Language Centre of the Chinese University of Hong Kong (CLC CUHK) has been using Blackboard, an e-learning tool in the Chinese language teaching curriculum. It helps teachers to teach and manage language courses effectively, and provides students with experiences in a multi-dimensional language learning environment.

Blackboard is a virtual learning environment and course management system developed by Blackboard Inc. Its main purpose is to add online elements to courses traditionally delivered face-to-face. Blackboard allows teachers to add interactive course materials including assignments and online quizzes, to engage powerful and flexible online learning experiences for students by answering questions, entering text messages, or uploading coursework.

The e-learning teaching methodology breaks the limitation of traditional classroom teaching, and fosters the execution of new teaching methodology and teaching models. There are mainly three reasons for CLC CUHK to develop the Blackboard e-learning tool. First, based on students' orientated learning environment, Blackboard can fulfil students' learning needs with different levels. Secondly, Blackboard can help students to get a good foundation before they attend classes for an in-depth discussion with their teachers. Lastly, teachers can use Blackboard to manage teaching, and supervise the learning process of each student in order to achieve the goal of teaching in line with student's ability.

This research will focus on the application and effectiveness of Blackboard in Intermediate Chinese Speaking and Listening Course (ICSLC), and bring suggestions for how Blackboard can cooperate with classroom teaching so that it will improve students' speaking and listening abilities in the future.

2. Literature Review

Web-based learning, often called online or e-learning includes online course content discussion forum via email, video conferencing and live lectures; these possibilities and several others are all

available through the web. E-learning is an outcome of an information revolution across all disciplines, including foreign language learning and teaching (Al-Dosari 2011).

Within the Web of Learning metaphor, educational professionals can begin to design models and frameworks that can clarify and simplify online educational possibilities. Our hope is that more innovative, engaging and exciting pedagogy will ensue. The Web of Learning contains a plethora of educationally relevant and continually evolving resources, tools and learning materials, many of which are increasingly open and free to the world (Bonk and Zhang 2008).

It is clear that e-learning tools and learning approaches within the Web of Learning hold exciting possibilities for personalizing the learning experience of young and old, visual as well as verbal learners, and digitally inexperienced as well as digitally savvy online learners (Bonk and Zhang 2008).

Commonly cited reasons for enrolling in Web-based learning include the flexibility of learning across the time, distance, and space. Another factor typically mentioned is an opportunity for empowerment and autonomy with the wide array of learning options and choices at one's fingertips. With online learning, students enjoy enhanced personalization and a sense of control or ability to take charge of what they need to learn. Other reasons include a personal desire to explore knowledge and ideas, the ability to network globally with peers and exchange ideas with like-minded others, and a chance to satisfy one's curiosity (Bonk and Khoo 2014).

The advantages of developing an online listening instructional model for English as a Foreign Language (EFL) learners have been proved by Tian and Suppasetsee (2013). Their findings revealed that the online task-based interactive listening model was suitable to teach English listening online with task-based approach, emphasizing interaction, activity and flexibility. This Model brings broad changes to the traditional way of teaching listening skills in English and the students could learn English listening anytime and anywhere through this method. Mullamaa's experience of using e-learning as a support to their eye-to-eye classes has proved to be positive and stimulating both for the students and the teacher. At the same time, there has been a strong incentive from their university to encourage teachers to explore the possibilities of on-line learning. In language teaching, the educational and tutoring support available can be used in creating the e-learning environments for teaching general language courses in different languages at different levels, at the same time, information communications technologies (ICT) can foster student-based learning, individualisation and support building up a sense of belonging to a community (Mullamaa 2010).

E-learning also has its limitations. Some educationalists reserve the option of having the electronic environment "overtake the classroom". Zumor (2013) examines students' suggestions for improving the quality of Blended Learning course which is merging the features of face-to-face language instruction and online language learning via the Blackboard learning management system in a new pedagogical approach. The limitations and problems rated and identified by students can be controlled by the institution. Some of these limitations and problems are technical, others are related to students' readiness, and some maybe caused by how the online activities are handled by instructors. Both students and instructors require appropriate orientation and training. The limitations and problems mentioned by students indicate a general feeling of dissatisfaction. These limitations and problems caused more than half of the students to believe that Blended Learning is less effective than face-to-face learning (Zumor 2013).

3. The Curriculum and Objectives of the Intermediate Chinese Speaking and Listening Course

This ICSLC opens for foreign students at CLC CUHK after foreign students finish 270 to 325 hours of Chinese courses or pass the placement test, achieving the same level. The teaching methodology of this course includes four aspects: first, improving students' pronunciations; second, reinforcing and reviewing grammar; third, focusing on practicing daily use expressions slangs and idioms; fourth, improving students' presentation skills especially usage of conjunctions. At the end of the course, students should have stronger communicative skills in Chinese.

The content of this textbook is divided into five chapters, with traveling, job interviews, discussing the advantages and detriments of changing careers, introducing life styles in foreign countries, working environments in companies, introducing a city and with reading comprehensions of introducing travel experiences, comparing the good points and bad points of two different kinds of travel styles, preparing for job interviews, complaining about real estate and introducing Macau for students learning different stylistic articles. The objectives are to review and consolidate those grammar points and vocabularies which they have learned before, improving students' speaking skills in daily life and the work environment.

This course uses a step-by-step format to assess students' listening and speaking abilities. It contains five listening quizzes, and five speaking exercises, one speech for mid-term oral exam, and a final oral exam on one-to-one basis.

4. How Blackboard coordinates with the teaching of Intermediate Chinese Speaking and Listening Course

Blackboard plays an important supportive role in teaching and accessing students' listening and speaking abilities. Four types of exercises are uploaded for ICSLC: 1) vocabulary exercises, 2) text listening exercises, 3) the listening version of reading comprehensions, and 4) post-text listening assessment.

The learning process reflects the coordination between Blackboard and classroom teaching: teachers open online text listening exercises to students, and set deadlines for students to finish it before they start to learn another chapter. Teachers may use 'full grade centre' to check students' learning progress. If students cooperate with teachers by doing the exercises through Blackboard, by the time they meet in class, teachers need not spend too much time to drill vocabularies and correct mistakes. Teachers may discuss and interact with students directly when students who finished the text listening exercises have better understandings of the whole text and therefore may enter into an active interaction in class, and the self-learning ability of students improves.

Regarding giving speeches, students may seek inspiration for speech topics from the post-text listening assessments through opened Blackboard exercises. Teachers may open the listening version of reading comprehension exercises if the students have reached a higher level. Students may learn in different ways, with intensive trainings, which can improve their presentation skills of complicated topics.

Traditionally teachers spent lots of time and energy in class to help students practice speaking and listening. The learning was not efficient as students often have not practiced well in advance. Nowadays students use Blackboard to prepare, review, drill, imitate, and experience a variety of language learning styles, and put all the things they learn into their language frameworks.

In summary, the Blackboard e-learning tool is playing an important role in language teaching. It is not only an e-learning platform, but also a bridge for achieving the same teaching and learning goals between teachers and students. With Blackboard's help, teachers can supervise, and manage students' learning process anytime. If teachers want to conduct an academic research about this e-learning issue, they may easily get statistical data regarding duration, quantum and quality of students' input from Blackboard.

Blackboard can provide teachers with every student's learning process and individual learning behavior: for example, when to login, when to finish the exercises, the time used, marks and grades of every exercise, the best result, etc. Teachers may monitor progress and remind students to finish exercises if they have not done so. This shows that Blackboard, as a communication bridge for teachers and students, can help improving teaching effectiveness.

5. Students' feedback on computer technology in teaching Chinese as a second language

In order to know more about the situation of students using Blackboard, we sent a questionnaire about multi-media technology and language teaching to the students, and asked them about the advantages and detriments of Blackboard, as well as other related questions. We sent 24 questionnaires in total, and got 17 with valid feedback.

The advantages of using Blackboard in this course include: 1) a network that can help students study anytime anywhere – students like to use mobile phones to login, and they discovered that the ability to practice Chinese 24 hours a day is very convenient, 2) Blackboard's effective management (it is even better to ask students to finish the exercise within a limited time, letting students re-do the exercises later on), 3) diversified exercises within Blackboard (students can listen to the text, practice pinyin, review what they have learned in class, self-test on still not mastered content, and do self-learning), 4) convenience for students to finish multiple choice questions through Blackboard, which is better than finishing them on paper.

On the other hand, students encountered many difficulties when using Blackboard, such as: 1) technical problems (files can't be opened, files have errors, browsers have problems, students can't use Blackboard with their own computers), 2) students are not familiar with the management system of Blackboard, missing the submission time, and are not able to finish the assignment, 3) students' personal problems, such as being too busy or procrastination.

Although most of these groups of Y-Generation students grew up with the fast development of computer technology, there are still seven students have never used any web-based teaching software.

The other ten students used: WebCT (3); Moodle (3); Cyber Campus (3); and unknown software (1). From the students' point of view, they tended to use only one type of software for all universities and all courses so that adaptation would be easier. According to the questionnaire, 79% of students agreed to use the web teaching mode, and they believe that certain aspects could use more applications including listening, listening to Chinese songs, make-up lectures, chatting, learning more vocabularies, using the iPad to learn, doing extra exercises after class, etc. There are two students who disagreed with the web teaching method, and they believed that it is more effective to use textbooks, and that submitting homework by paper is better than by the Web.

6. Teachers' reflections on e-learning platform Blackboard

With the rapid development of computer technology, teachers should follow the trend and learn the techniques of different kinds of web teaching software's. With the help of all the teachers using Blackboard, lots of suggestions and feedbacks were collected so that we can analyse and observe this issue from different angles.

Most of our language teachers believe that using Blackboard has lots of advantages: 1) it is easier to communicate, and teachers can communicate and interact with students in real time, answer students' questions, and give feedback right away, 2) Blackboard can remedy the defects of teaching in class by helping teachers to teach in line with student's ability, 3) strengthening learning after class, Blackboard can transmit diversified information, including giving homework, etc. Teachers can design and compile exercises in advance, and don't have to restrain teaching to only within the classroom. This will extend classroom teaching after class, 4) Blackboard can help teachers save time in correcting students' answers. When students finish their exercises, they can get the results immediately after they submit their work.

Teachers also find that using Blackboard has some limitations and disadvantages: 1) If the web learning software is not popular, they will be eliminated and replaced anytime, 2) The demand for teachers' computer ability level is improving. If teachers don't have a technical supporting team, it is difficult to design the perfect Blackboard exercises by themselves, 3) Moodle exercises require students not only to have independent learning skills, but also to have good computer skills. For both teachers and students, improving computer skills is necessary to use Blackboard more smoothly and efficiently.

Teachers are playing as a course's supervisors, monitors, assessors, and managers when using Blackboard; Blackboard plays the teaching aid role. Experienced teachers may summarize the key points when teaching according to their treasured experiences, and put those key points and difficulties on Blackboard, using those key points to make new exercises so that students may do the exercises based on their individual needs.

The school technicians should provide more support for teachers in the teaching process by collecting and doing statistics, on-line Q/A sessions during the day, helping teachers do the more repeated steps, and holding training workshops regularly for teachers. If teachers cooperate with technicians, and they change the listening and speaking exercises to the video playing format, this will make students more accepting towards these kinds of exercises, and the learning effectiveness will be more obvious.

7. Conclusions

Learning should be available to access anywhere, anytime, and offer learners to best possible experience. Right now technology can enable that across universities, school classrooms and professional training. Blackboard's innovative technologies have been improving quality outcomes. It manages and monitors students' learning process easily and effectively. It helps teachers to improve the effectiveness, breadth, and depth of classroom teaching by giving students more exercises on preparation, revision, intensive drilling, and assessment of these aspects.

Students are giving positive and optimistic feedback about using computer technology in Chinese Language learning. The e-learning platform, Blackboard, matches well with students' learning habits and methods. By using Blackboard, we make the language learning experience more engaging, more collaborative, and more effective for everyone.

Most of our language teachers agree that Blackboard can help to improve teaching quality more effectively. With the tool to engage, collaborate, grade, track assignments, teachers can reach students effectively to ensure they are interacting with the content and curriculum in the most effective way.

In future, we hope developers can design more user friendly Chinese learning software's which would be easier to learn and use, so that even users with less computer knowledge may handle situations

with ease and benefit from using them, and teachers with the support of computer software's may create many more efficient web exercises to improve students' Chinese abilities.

References

- Al-Dosari Hamad (2011). Faculty Members and Students Perceptions of E-Learning in the English Department: A Project Evaluation, *Journal of Social Sciences Vol. 7, No.3; 2011*, p391-407.
- Bonk Curtis J. & Zhang Ke (2008). *Empowering Online Learning 100+ Activities For Reading, Reflecting, Displaying, & Doing*, San Francisco: Jossey-Bass.
- Bonk Curtis J. & Khoo Elaine (2014). *Adding Some Tec-Variety 100+ Activities for Motivating and Retaining Learners Online*, Indiana: Open World Books.
- Mullamaa Kristina (2010). ICT in Language Learning – Benefits and Methodological Implications, *International Education Studies, Vol. 3, No. 1 February 2010*, p38-44.
- Tian Xingbin & Suppasetseree Suksan (2013). Development of an Instructional Model for Online Task-Based Interactive Listening for EFL Learners. *English Language Teaching Vol. 6, No. 3; 2013*, p30-41.
- Zumor Abdul Wahed Q. & Refaai Ismail K. Al (2013). EFL Students' Perceptions of a Blended Learning Environment: Advantages, Limitations and Suggestions for Improvement, *English Language Teaching, Vol. 6, No. 10; 2013*, p95-110.

TEACHING AND LEARNING IN TECHNOLOGY RICH SCHOOLS: TRADITIONAL PRACTICES IN NEW OUTFIT

Catarina Player-Koro¹ & Dennis Beach²

¹*Faculty of Librarianship, Information, Education and IT, University of Borås (Sweden)*

²*Department of Education and Special Education, University of Gothenburg (Sweden)*

Abstract

This paper examines the issue of technology optimism through critical ethnographic research from two years of study within four upper secondary schools in Sweden. These schools have invested in one-to-one lap-top initiatives as a claimed means to solve important problems and transform educational settings to the better based on a belief in the capacity of technology to change things in a progressive common interest. We examine the degree to which this seems to have happened. We discuss the technology optimism discourse as one that has allowed a marketization process to take over schools in the interests of corporations and examine if a process of false marketing can be said to have taken place as part of an exploitation of education in the interests of corporate profit. There is strong empirical support for this suggestion. One-to-one technology has not had strong effects on pedagogy in the two schools whilst corporations have made vast profits from the sale of computer hard- and software to schools in one-to-one and other similar ventures.

Keywords: *Technology optimism, one-to-one initiatives, critical ethnography*

1. Introduction

This paper takes its departure from an educational project from a girl's Methodist school in Melbourne Australia that was the first known to us to use one-to-one lap-top computing for educational purposes, which it did well before initiatives by hard and soft-ware corporate giants to develop one-to-one computer actions as a global venture launched from a bearing discourse of technology optimism. In this discourse computer technology is claimed to solve problems and create educational change and effectiveness. In the paper we attempt to examine this issue through critical ethnographic research and results from two years of study within four upper secondary schools in Sweden. These schools have invested in one-to-one lap-top initiatives as a claimed means to change and 'effectivise' education, solve important problems, and transform social settings to the better based on a belief in the capacity of technology to change things in a progressive common interest. We examine the degree to which this seems to have happened. We discuss the technology optimism discourse as one that has allowed a marketization process to take over schools in the interests of corporations. We examine if a process of false marketing can be said to have taken place as part of an exploitation of education and education actors by capital in the interests of corporate profit. There is strong empirical support for this suggestion. One-to-one technology has not had strong effects on pedagogy and teaching and learning activities in the two schools, or indeed in any other schools that we are aware of whilst corporations have made vast profits from the sale of computer hard- and software to schools in one-to-one and other similar ventures (Player-Koro, 2012a, b). In the original project the lap-top was expected to be a valuable teaching and learning aid much like the text-book and pen and paper had been. It was not intended to work as a revolutionary device that transformed the education field and its social relations. This highly marketed idea or 'hype' has been associated with lap-top initiatives since then but never actually proven.

There is a significant point to be made here about the common relationship between capital and education. Capitalist corporations are often keen to seem to sponsor education and laptop initiatives are often a common part of these sponsorship packages. However, what has happened here is in line with another scenario within which capitalist organisations, who in line with formulations made by Marx in chapter six of *Capital* are always looking for new possibilities for making a profit. They found these opportunities in relation to the Melbourne experiment and then invested money in order to first expand and then exploit them through the peddling of computers and study guides, licensed software, educational

CDs and other digital learning tools on a massive scale that were also designed as needing to be constantly updated and re-licensed. An entire new edu-industry has been created, but the initial venture wasn't started by capitalist corporations. It is simply a further example of how the dominant economic class can rob the culture of subordinated groups and sell it back to them at a profit.

2. The investigation aims and methods

As indicated already, the present paper is based on the results from two years of ethnographic research in four upper secondary schools in Sweden that have invested in one-to-one lap-top initiatives in recent years. Its aim is to test whether the claims that are made about laptop initiatives are actually realised and in what way based on data that has been produced through surveys, semi-structured focus group interviews with school principals and teachers, and video observations from everyday work in classrooms. We wanted to make visible, describe and analyse everyday educational/ pedagogical work in these technology rich schools to see exactly how (or perhaps if) education really is made more innovative and productive by the use of one-to-one lap top technology. Previous investigations have suggested that it might not be and that instead, one-to-one laptops are just useful educational tools. In this way the investigation tries to look beyond the often taken for granted views that describe technology and computers only in terms of their potential to improve and innovate education.

The four upper secondary schools that been investigated were all situated in relatively rich suburbs and had a predominantly middle class intake which together with an ICT-profile could be assumed to be positive in terms of increasing the possibilities for successful one-to-one projects and effective learning outcomes. That was out assumption at least and the choices therefore represent what we feel are positive case selections in this sense. The schools all have an expressed policy for the use and integration of digital technologies and their educational performance levels are above national averages. Bernstein's concept of pedagogical discourse analysis has been employed in the research project. The following questions were given special attention:

- What teaching and learning patterns can be found in technology rich educational practices?
- What discourses appear to structure educational practices in conjunction with the infusion of one-to-one initiative?
- What transformational potential is suggested by this?

We have conducted the research using ethnography, which to us means basically trying to learn about people and their everyday lives based on long-term engagement with them through participant observation. This involves not only watching what is going on but also listening and feeling as well and produces a particular kind of knowledge because of this. This knowledge is not simply propositional, instead it consists of sensuous practical knowledge gained from skills of perception and capacities of judgement that develop in the course of direct practical engagements with our surroundings and people in them. Ethnography is particularly strong because of these characteristics in producing unique studies that provide detailed, in-depth descriptions of practices and meaning at particular places and times. It contributes in this way to new, finely grained knowledge about the conditions of specific educational systems and their demands based on documentations of and interviews about their most minute and intimate details. Ethnography places a human face on research.

3. Results

The results indicate that most of the teachers used ICT regularly in their teaching and 40% used it on a daily basis. They described search features, educational materials and the computer screen as a new tool for communication, where the projected screen image became in effect a new whiteboard as the main reasons for using the computer. Observation protocol supports these points. The use of the computer and the teachers' use of space created a focal point in the classroom around the whiteboard and projector screen, which were used for displaying the computer screen content. In this way classroom regionalisation seems thus to have remained structured and front focused. This applied even though, not despite, new digital technology being fully integrated in the teachers' everyday work.

Teaching from the front of the classroom was still the most common way of organising the lessons even according to questionnaires and interviews. 23 % of teachers responded in the questionnaire that teaching from the front was used in more than 50 % of their teaching time and 61 % responded that this way of organising classroom work occurred in at least 30 % of their teaching time. This was also evident in dialogue during focus group interviews: *Teaching is no different ... I stand at the board... Before I had an overhead projector whereas now I use PowerPoint. ... Yes ... now it is natural... The*

computer is second-nature... whereas it wasn't before... you had to book, a computer lab and all that.... I don't think that education has changed pedagogically ... but it is a tremendous gain in communication ... students can retrieve articles from the Internet or go to any Twitter account and tweet directly with politicians for example... it's a big change ... but not pedagogically... but the ICT certainly provides more tools for communication... the world has become closer ... it's very easy for students to listen to things and find interesting texts... (focus group interview 2012-06-14)

Individual task based activities using ICT were common. 46 % of the teachers responded that this kind of classroom work occurred during at least 30 % of their classroom time. This pattern has also been noted by us in earlier ethnographic work. However, what teachers do within these forms of front-on work may have been changed through the use of ICT. Citations from focus group interviews serve to illustrate this. For instance: *A change is that I can stream the movie ... I do not have to order it as I used to have to do ... I no longer have the usual (printed) textbooks ... it's really convenient to have computers instead ... only to search on specific topics ... I think that saves time and that students get a different picture than just reading a book.* (focus group interview 2012-06-12).

Taken together and in relation to the research question concerning the teaching and learning patterns that are evident in technology rich educational practices the results suggest that the one-to-one initiative has resulted in a high frequency of use of ICT as an integrated tool for teaching and that ICT is a component of a digital infrastructure that is also used for the organisation of the education. The learning platform is a key component of this. But in many senses these changes don't represent changes in pedagogical principles. Conventional examination forms are still in place. ICT is the medium for their production. It is used for text production, communication, and information retrieval, thus replacing traditional media rather than changing principles of organisation and communication or transforming educational outcomes. It has replaced textbooks, pen and paper and seems thus to have primarily taken over their respective roles. ICT has had an effect. But not in a deeper sense! It has affected some working methods but teaching is organized primarily according to traditional patterns and power relations. The power centric relations of space in the classroom have not been reconfigured and the modality of education does not seem to have been affected significantly in terms of classification, framing, or pedagogic discourse. This is also in line with our initial starting point and previous studies that have repeatedly shown a considerable lack of evidence regarding transformation or enhancements of educational standards.

Sometimes the explanation for the failure or absence of IT impact is made by pointing at the teacher as the major hindrance to the successful implementation of technology in schools. However, this cannot be said to apply in the present case, as in this research most of the teachers had a positive attitude toward technology and found it useful for managing their professional work, even if their view of teaching was somewhat traditionally organised. Thus an important point for us in this respect is to stress that it is not the teachers who should be regarded as failures. Instead, the use of technology should be analysed and understood in the context where it appears, and in relation to the complex web of policy demands and the different expectations and requirements which teachers are obliged to take into consideration.

Taken together the results provide an example of issues that were brought forward by the teachers concerning how educational policy is related to the formation of the pedagogic discourse and how the field for policy production seems to have prevented teachers from making innovative transformations of their teaching, not only through the implementation of ICT in their pedagogical practice. They concern how performative demands from national testing tend to structure the formation of the pedagogic discourse and the way teaching is focused on preparing students for the national tests. It is national testing rather than the presence of technology that steers teachers' pedagogical decisions the most.

The main findings thus suggest there is a frequent use of technology in classrooms but that this use is a form conservative modernisation in a context of educational reforms that are structured by neo-liberal and neo-conservative movements in terms of high stakes performativity, all of which are clearly issues that press down on teachers in their teaching and learning in ways that could be considered as mainly traditional, and that seem to have highly traditionalising effects. These effects have been such that although in principle all the teachers in the investigation schools had been described and identified by their principal as ICT-innovators with a positive attitude towards the use of technology, and despite them finding it to be a useful tool for managing their professional work, they have remained highly traditional in their basic pedagogical perspective and activities and have given no sign that the use of technologies has played a significant part in education innovation. This does not mean that teaching has not changed. The point is instead that the introduction of ICT in educational settings seems to lack the potential that is often referred to, namely that of *transforming teaching and learning*. Indeed instead it seems to be used within established power structures and relations, which are in practice reinforced not challenged.

4. Discussion

In Sweden as in many other countries, an increasing number of education districts are investing in one-to-one laptop initiatives. This integration has been accompanied by a national debate in which information and communication technology (ICT) is often singled out as a key enabler for bringing about a needy modernisation of education and training to enable our nation to remain competitive in the globalised economy. This debate is also a global one. It involves ideas about the development of educational processes with measurable outcomes both for stakeholder satisfaction and educational performance assessment. There is a techno positivist assumption that social, economic and cultural advancement and the solution to any eventual social crises can be found through and in technological innovations, which seem to be automatically marketed and accepted as able to solve important problems and transform social settings to the better for all. The diffusion of innovations is held and promoted to be the main factor determining changes in organisations or practices and ICT is presented as an enabler for social innovation and cultural developments that will revolutionise teaching and make education systems more effective.

These kinds of ideas have driven most (if not all) one-to-one initiatives in Europe, but after three decades of research there is as yet little empirical evidence to support the claims that are being made (Selwyn, 2011). Instead, what hard evidence there is actually suggests that ICT has hardly brought about any transformative changes to pedagogy at all and that initiatives such as one-to-one teaching and learning could not yet be viewed as high impact. This doesn't mean that ICT has not had any impact at all. Indeed it has. It has had a significant impact on management and administration, but the instructional use of ICT has not transformed teaching and learning or improved students' academic achievements in any significant sense.

However, two points should be noted here. Firstly, there are no scientifically supported empirical studies that claim that ICT has been introduced to revolutionise classrooms and teaching, let alone that it has done so (Player-Koro, 2012a, b). Rather instead, from the initial Melbourne experiment onwards, ICT has been a tool for attaining traditional aims of knowledge development and improvement as a replacement for traditional pen-and-paper, which it has also arguably done more effectively than did the tools used in the past.

ICT has in other words been a tool for meeting the demands of education not changing them. Secondly, performativity demands on postmodern professionals and examination requirements are what are emphasised the most by the teachers and these externally imposed demands (the terrors of performativity), rather than the presence of technology, are what contribute the most to the structuration of their working activities and its content. They work in this way, as the data suggests, through the regulative effects of examination-based performativity discourses on the instructional part of the pedagogic discourse and can be seen in the selection of subject content and in the interactional patterns during lessons. Thus, even when ICT was integrated in the teaching and learning activities observed, the examination demands worked through the teacher as an intermediary and were very much in control of what was selected as content and how this content was sequenced and paced. In the Durkheimian sense of education in the interests of social integration and control, there is little if anything that is really new about this. The pedagogic discourse can be seen to have been structured from performative demands and national policy documents together with traditional forms of evaluative criteria reinforced by an ever-increasing emphasis on assessment as a result of the recontextualising of official political discourses around performativity as opposed to creativity.

5. A tentative conclusion

The main results from our investigation thus paint a fairly clear picture and at two levels. The first level is that a quintessentially educational initiative at a girl's Methodist school in Melbourne Australia has been economically exploited by capitalist corporations in the interests of profit, without any economic reimbursement to the agents whose intellectual activities became a source of unpaid labour power and that this exploitation was a forerunner to the current mass exploitation of schools and the actions and people in them by the ICT industries in the interests of further their private profits. The second is that technology optimism has allowed a marketization process that has also worked in these interests. One-to-one technology has not had strong effects on pedagogy and teaching and learning. The teacher is still in control of the selection, sequencing and pacing of the content that the state determines to be official knowledge, the exams are still the main structuring force behind what goes on during the lessons, and ICT seems therefore to have had no general context independent impact. The conclusions to be drawn from this are therefore very much in line with those of other extensive and critical studies. They are that one-to-one learning initiatives in Sweden and elsewhere seem to evidence only a weak link

between technology use and the transformation of educational practices. But there is one possible difference between our conclusions and those of others. This is that in other research the suggestion tends to be that the full potential of the use of ICT has not yet been reached, but that it can be: this line of reasoning springs from the conviction that ICT plays a prime role as a key enabler for innovation in education. Our claim is that a process of false marketing has taken place within which technology is claimed to solve problems and create educational change and effectiveness in ways in which it doesn't, cannot, never has, and has furthermore never been seriously suggested to be capable of.

References

- Player-Koro, C. (2012a). Hype, hope and ICT in teacher education: a Bernsteinian perspective. *Learning, Media and Technology*, 1-15. doi: 10.1080/17439884.2011.637503
- Player-Koro, C. (2012b). *Reproducing traditional discourses of teaching and learning mathematics [Elektronisk resurs] : studies of mathematics and ICT in teaching and teacher education*. Göteborg: Department of applied IT, University of Gothenburg ; Chalmers university of technology.
- Selwyn, N. (2011). Technology, media and education: telling the whole story. *Learning, Media and Technology*, 36(3), 211-213. doi: 10.1080/17439884.2011.572977

SIGNIFICANT LEARNING IN VIRTUAL LEARNING ENVIRONMENTS

Richard Gagnon

Département d'études sur l'enseignement et l'apprentissage, Université Laval (Canada)

Abstract

In accordance with Jung's model of the human psyche (1991), we acquire deep and significant knowledge insofar as we put to use every suitable mean—or psychological functions as Jung calls them—at our disposal, namely our senses, intellect, affectivity and intuition. A rich knowledge is then developed, like that of a very close friend; otherwise, extremely poor knowledge may result, such as the one we have about the origin of the Universe. But then, what type of knowledge do we develop when the interactions that we have with people and things are mediated through virtual learning environments? This is what we deal with in this communication. First, we briefly summarize Jung's model of the psyche and, in particular, the characteristics of the psychological functions in relation with learning that could be considered significant. Next, we analyse each function to determine how they would operate in a virtual environment in which a very large number of otherwise real stimuli are simulated. We find that each function would respond differently—with thinking most likely the least affected and sensing the most—and that the combination of these four functions applied to a learning product largely virtual, i.e. strongly transformed by technology, could result literally monstrous. Indeed, proceeding from a truncated “object” which has been more or less transformed (for example, the visual representation of a person coupled with an artificial voice or a series of images simulating the free fall of a lead ball) instead of the original, the learning product would result from responses of the psychological functions activated by the learner potentially inadequate if not totally improper, certain functions having been fooled in the process. We argue that a strange, almost humanoid knowledge come out of this still much misunderstood and almost totally unsuspected Man-Machine collaboration (Gagnon, 2013). It rests with us, educators, to deal with the consequences.

Keywords: *virtual learning environment, Internet, social networks, man-machine collaboration, meaningful knowledge*

1. Introduction

One cannot learn to distinguish the taste of a mango from that of an orange from their description alone and thanks only to our thought. To achieve this properly, a repository of sufficiently precise and relevant sensations is needed, constituted in our memory over the course of our previous tasting experiences, which one uses together with our sense of taste, but also with those of smell, sight, touch, and even hearing. The body makes itself essential to this learning, and the heart, to assign some aesthetic appreciation to the taste of both fruits. The same is true when one intends to master a musical instrument, whatever it is, it clearly requires the contribution of the body, heart and mind.

The learner thus enters in a highly specific and unique relationship with the object he has to learn, and this relationship depends on the means he has at his disposal to do so. Drawing on Jungian psychology, they are among four, Jung (1991) calls them psychological functions, namely: *thinking*, *feeling*, *sensing* and *intuition*. The first two functions express themselves through time and are considered rational; the last two, considered irrational, support perception, they manifest themselves in the moment, at once.

What happens then when the object of learning go through information and communication technologies (ICT), which insert between the learner and the object to learn a “technical layer” of ever thicker and increasing complexity? Neither the mango nor the orange pass through this layer, obviously, and the relationship of the user of these technologies to time—it accelerates—and to space—it shrinks—is deeply disturbed. To what extent, then, and under what aspects is the relationship between the learner and the object of learning altered?

2. A meaningful learning

We can think about something, speculate about it, establish cause and effect links with other things or events, categorize it in a class that satisfies the intellect according to logical criteria and rules. If we succeed doing that, we generate consistent learning from the perspective of *thinking*, i.e. an understanding which can be communicated intelligibly to another mind, judgments of the right or wrong order, knowledge attested by the mind. This is what happens when we seek for instance to demonstrate a theorem of geometry. Of course, doing so does not preclude experiencing emotions superbly significant—and of considerable importance in teaching to the point that they profoundly influence educational choices—but ... collateral!

We can also develop an emotional relationship with the object of learning, speak to it from the heart, through *feeling*, as when very often we are listening to music, and, of course, as in our love affairs. This is our ability to distinguish between the beautiful and the ugly, which is expressing, between the good and the bad, our aesthetic and moral sense. The theorem of geometry is no longer only the result of a hypothetic-deductive reasoning, but is combined perhaps with the feeling of pure pleasure provided by the elegance of the demonstration or, conversely, with the arrogance of a teacher towards those put off by the difficulty. Still richer links can be established when it comes to “learn” an animal or another person, since a proper and reciprocal emotional communication can then be established between the learner and the object of learning. It is in this way that empathy develops during training in a medical profession, in addition to the clinical knowledge of the various conditions of patients, or that a child learns to care for his or her pet.

Moreover, as with the mango or the orange, we can establish contact with the learning object through our senses, we can touch it, smell it, taste it, hear it, watch it, feel its weight, its strength, its volume, its density, we can move it, manipulate it. Carpenters embody the so-called Pythagorean theorem in the form of a wooden triangle three foot high, four foot long, with a five foot hypotenuse. Fitting the triangle at the intersection of two walls checks in a gesture its squareness. This is concrete geometry. In the case of a piece of wood, by looking at it they can determine its essence, finish, quality, they can estimate its length, its degree of residual moisture, they can even “weigh” it. *Sensing* is at work. Imagine a professional cook at a vegetable, fish or meat market!

In a more mysterious way, finally, we can get in almost magical contact with the object of learning, at least without premeditation. Suddenly an idea arises, as if knowledge were given to us or, more likely, as if our mental processes continued to function muted, below the threshold of consciousness. We perceive what is not, somehow, we transcend reality, we guess, without our reason interfering. At once, truth has occurred to us, that we need later to test with the other psychological functions if we want to convince our fellow of its correctness, since *intuition*, like sensing, can be misleading. It delivers truth, however, in the same manner and with the same force of persuasion than the latter.

These four psychological functions are means available to the human being to probe the world; and we shall readily admit that the knowledge of an object developed using each and every one of them would be particularly rich. Besides, a substantial part of this learning will probably have occurred in the unconscious, as we often realize it, but later when we use the knowledge, we did not even know that we knew! Conversely we shall also admit that when only one psychological function is activated in a learning process, the resulting knowledge is not only quantitatively poorer, unless a huge compensation is made by this function, but, above all, it only manifests the nature of this psychological function: the intellect is not moved by a poem, even sublime, it analyzes it! Compared with photography, we then contemplate a monochrome knowledge.

Of course, we each have our own preferences among the four psychological functions, which we exercise more or less skilfully. Generally, we tend to use first our favourite for all our learning, the one we master best and in which we have the most confidence. And we neglect the others. It would be more accurate to say that we belittle them. As a consequence, we present a specific psychological profile that characterizes us, a learning style that reflects our preferences, more or less adapted, unfortunately for many, to the types and conditions of learning that school, employer or society will impose upon us.

But when we use successfully the four psychological functions to grasp an object of learning that allows the four types of relationships pertaining to these functions, the richest possible knowledge accessible to a human being is developed, altogether intellectual, emotional, tangible and transcendent. If, in addition, the various aspects of this knowledge have a congruent character, i.e. if they complement each other in a consistent way, a high degree of significance will result in the learner, giving to this knowledge a very high degree of stability. As a consequence, to negate or modify substantially this knowledge will end up being particularly difficult.

If, on the contrary, it is not possible to use all our psychological functions to approach a learning object, as it is often the case in science for instance—we do not feel the rotation of the Earth, there are no more dinosaurs, the electron is a useful concept but quite abstract—what can we learn of this object and what is this knowledge worth? Almost nothing, at least compared to the knowledge we can have about a mango or an orange, because it does not link directly with our human experience of things within reach. As for our emotional relationships with such learning objects, they are at best aesthetic, or very indirect, being associated with circumstances and people or with a collective enterprise more or less impersonal. True, we have of those objects a sophisticated intellectual knowledge, thanks to the conceptual formalism to which they are related, but literally no empirical knowledge as scientific experience do not put our senses in contact with the objects of learning as such, but with the measuring instruments we use to corroborate or refute our hypotheses about them.

3. From real to virtual

As we have just seen, the characteristics of the object under study limit the scope and richness of the learning that we can do about it so that it is not always possible to use all our psychological functions to grasp it. It is to overcome, at least partly, these limitations that we develop tools, techniques and technologies because they allow us to circumscribe to a certain extent the objects under study that otherwise would escape us much more. Admittedly, the resulting knowledge is limited because not all the learning modes of the learners have been engaged, but it appears much better than it would had been possible to achieve without these devices. It is also entirely representative of the learning that most schools, colleges and universities encourage as they rarely look for really complete knowledge.

Conversely, the chosen means and modalities to learn may also limit learning. That is what the school does, for example, whenever it replaces a real object, potentially available, by a model or representation of it, necessarily more abstract, like a photograph, drawing, text, simulation, equation, speech..., i.e. any language or anything that allows to study the given object under the particular aspects selected by the school, without requiring a complete knowledge of it that the school, in any event, cannot produce on its own.

These two types of limits, related to the learning object itself and to the means and modalities of learning, both create a truncated learning product compared to what we have called a complete knowledge. Of course, this does not really surprise us because we easily encounter in these types of limits the conditions for study and research in which we have been immersed for the past few centuries. Gradually we have learned to recognize as such the substitutes or alternative models of the objects that we had to study without confusing them with what they were intended to represent. We do not get troubled. Artificiality, virtuality and reality remain distinct still, we do not pull the wool over our eyes, though photography, but especially cinema, has begun, for some time now, to fool our brain.

Then came the special effects. Computers everywhere, more powerful every day. The World Wide Web. Smartphone's. Multifunction tablets. Social networks. Blogs. Online courses. Books online. Music online. Colleges and universities online... "Friends" online. As soon as one wishes. A few clicks away. And many dollars!

The space has disappeared, suddenly, swallowed in the moment. One does not travel anymore where things are, things just come to us. At the speed of our desire, which thus disappears. Of course, things only have the appearance of reality, but what a realism! In three dimensions soon generalized and, if one wishes, without these small flaws that bother, corrected by software that know more than us about what we should like, and probably sooner than we might think in all languages without any accent. A world so perfect, so accessible, so faithful to what we would like it to be, that we shall refrain going in the street for fear of regressing! Because we believe in it. We believe that what we see on the surface of this technical layer—of a thickness from now on hardly imaginable by the very people who design and develop it—is the reality, as concrete as the bite of a dog in our calf, or whatever you want to imagine of a similar order. But the *reality* is that we are facing models, simulations, images, highly sophisticated artificial representations that pose as *reality*.

Meanwhile, the learner, real and with good faith, without even realizing it, finds himself immersed more and more in a constructed environment, a kind of decor that evolution never taught him to inhabit as such. His school loses its walls, a few at a time, teachers are multiplying, outside the walls, they appear on the screen, in his hand, on one of the walls that remain, and some are famous. Students are in class, but anywhere, and then anytime. Sometimes alone, sometimes several; often they do not know. Because there is this hole in the solid frame of the world, this enormous and unfathomable hole, where everything that makes life can be found, including others, including yourself: Internet! The school is no longer the protected place that it used to be under the care and guidance of a relatively small number of people that we had to trust, by necessity, to lead us where they had chosen for us to go, but an open

divide. The student does not escape through the window, he simply goes out, where he does not know, in lines of ones and zeros. The hole is not black, quite the contrary, it shines! But it sucks, let us dare the hyperbole, just as much!

The student then exercise at least some psychological functions without discrimination, unsuspecting, naively believing that what he perceives in front of him is indeed as it is *through the looking-glass*, at the original source of his perception, irretrievably since a significant part of his learning remains unconscious.

Knowledge fragments, and shrinks, it becomes incongruous, without the learner knowing it. It decays, it loses its unity. Would it be sick, by analogy? Schizophrenic? In any case, it runs the risk. Psychological functions do not all relate to the virtual world with the same ability.

Thinking deals with abstraction, and fortunately can help to make sense of things. It understands that what a human sees and hears, what he feels in a virtual world is a representation that may or may not correspond to what he usually considers reality. It accepts without complaint that no other human being is behind the computer playing chess with him, other than the programmers and specialists who developed the software used to play. It concedes that the videos produced to illustrate the structure of atoms or atomic nuclei are crutches, at times at the border of deceit, because we have no way to come into direct contact with these “famous unknown”. It is with good faith of course that we attribute to them properties observed at our scale of magnitude and interpretable by us, but literally incompatible with what our most refined knowledge of these entities implies. We have a problem, as we here come close to the very limitations of simulation.

Feeling is vulnerable because it operates only to the extent that it can rely on significant prior knowledge of the beings and things represented virtually. Otherwise, it projects and assigns to the learning object emotional features that the virtually represented object arouses in him, activating the same psychological process that advertisers seek to activate in us when they present to us as true a so-called perfect face artificially obtained from an *ersatz* painfully human; it fantasizes. Much unspoken information transits in a real interaction, including about what we still do not know how to simulate, such as touch and smell, as well as what we can perceive intuitively of the learning object. Feeling can be exercised over all this, and inform the learner of the outcome. But how can it reach significance if it has no access to this unspoken information, if it does not know *a priori* enough of the real object virtually represented?

Senses are down to earth. They never perceive intention, but always a limited number of properties, concrete, measurable, tangible, directly attributed to the sensed object, although these properties actually show the relationship between the object in question and the sensors in the human body rather than the intrinsic characteristics of this object. Colors and flavors do not exist in it, but in the interaction between certain physical and chemical constituents of the latter and the visual and gustatory apparatus that give rise to them in us. In the virtual world, we perceive the movements, colors and sounds that make up this world, that offer to our senses a substitute of what they are supposed to represent. In the real world, in addition, we see the material support of these representations, which reveals the substitution. But we never find the originals—unless they are in the same room with us, rather silly redundancy, but no longer astonishing considering all the screens in place in almost every theatre. Inevitable confusion between the real and virtual worlds should therefore come as no surprise when, as of now, the quality of the substitutes amazes!

It is always risky to speak of intuition, probably too closely related to the subliminal to be easily understood. We do not know how it proceeds, nor how to control it. We only know how to benefit from its action, if we trust it. But how does it behave in a pseudo-world, in a hybrid world, when the virtual “weighs” of all its stimuli on our being? Do we know it? My own intuition suggests that it probably runs into similar lures as the senses, with similar effects; and, like them, it may be mistaken. My intuition might be right.

Taken together, the product of these four psychological functions applied to a largely virtual object of learning, i.e. highly mediatized, could be monstrous. Failing to proceed from a full original object, but rather from a more or less complete object transformed by technology, it would be the result of potentially incongruent responses from the psychological functions involved in the learning process, being exercised on literally different subject matters. A deformed learning product would ensue from this process, that we would only recognize as such with hindsight through thinking which, as we have seen, is less easily fooled by technical tricks than the other psychological functions.

Otherwise, the danger is real to attribute to the resulting knowledge a value that it does not deserve: the simulation of a chemistry or physics experiment, even remarkably successful, still remains a simulation; life and death in a video game are not life and death, but the result of a set of rules properly programmed and applied; the written message from a computer to another one is addressed to one or more persons of real blood, flesh and bone, who read this message and interpret it as humans do, but the one who sent it perhaps is not who, when and where he claims to be!

4. Conclusion

Distance learning, networking, hybrid, synchronous, asynchronous, online learning... as we know it today and as it continues to evolve, is at the forefront of technological development underway since already several centuries; more precisely, as anything that evolves at an exponential rate, at the forefront of the latest developments. Therefore, using anyone of its modalities—from now on, almost always—a truly astonishing technical layer isolates the learner from ordinary human reality, the one we had been prepared to through evolution. To young people, who quickly become accustomed to the world in which they live, whatever this world is, this ordinary human reality becomes potentially suspect, even undesirable: where you have to wait to get what you want, and answers to your questions, where ignorance, even anxiety accompanies the freedom of the other, the one who is neither a mailbox nor a *Facebook* account nor an avatar in *Second Life* or in whatever “metaverse”, nor a “resender” of text messages or tweets, nor a position instantly locatable by GPS, where you have to travel physically to visit other countries and other people, where time flows into duration, and space into distance. This technical layer to which it is so easy to get used to, at least partially, yet creates two dependencies: psychological, as just illustrated, and financial, which speaks for itself.

Since 1971, according to Moore’s law, the power of computers doubles every two years, which means that in 2015, they are 4,194,304 times more powerful than they were 44 years ago. To give an idea, although I have absolutely no valid representation of the meaning of what you are about to read, it is as if your annual salary of 1971, which we assume was 6,000 €, had increased in 2015 to over 25 billion euros, and that in two years, in 2017, it would have doubled once more reaching over 50 billion euros! Very candidly, if that had happened to me, believe me, I would be one more misfit, socially totally incompetent. This is nevertheless what we all live in the area of information and communication technologies, and in its most spectacular manifestation: Internet.

Is it good or bad? One has to make his own mind. But the pace of change is such that we can never keep adapting. It has probably been a while since we stopped adapting; properly, I mean. And the pace of change itself accelerates exponentially, as a totally uncontrolled car. Human beings, the learners in our case, then board an uncontrolled technological device of which no one knows the destination, knowing barely the direction taken in the short term, a technological device without identified conductor, multi-headed, with an elusive body, a hydra of some sort, that a Hercules to come will have to defeat. Catching sight of the beast, it will be more difficult than the first time! More details on the topics treated in this communication can be found in Gagnon (2013, chap. V).

References

- Gagnon, R. (2013). *Éduquer après Carl Gustav Jung suivi de Métaphores et autres vérités*. Québec : Presses de l’Université Laval.
- Jung, C.-G. (1991). *Types psychologiques*. Geneva : Georg Editor S.A. (original publication in German, 1920).

PROJECT OF FLIPPED CLASSROOM'S INCORPORATION: AN EXPERIENCE BETWEEN PRIMARY SCHOOLS AND UNIVERSITY

**Jordi Simon Llovet, Elena Sofía Ojando Pons, Loles Gonzalez Garcia,
Miquel Àngel Prats Fernandez, Xavier Àvila Morera & Antoni Miralpeix Bosch**
Faculty of Psychology, Education and Sport Sciences / Ramon Llull University (Spain)

Abstract

Currently, learning is no longer an internal and individual activity to become a collective activity and network according to Siemens (2008) on the theory of connectivism that against the limitations of behaviorism, cognitivism and constructivism. Siemens (2008) proposes a revision of these models to promote new specific strategies to the digital age for teaching and learning, it focuses on how technology affects the way people live, the way we communicate and, above all, how to learn. This is implicit in the concept of Flipped Classroom model, which is presented as an alternative to the traditional model. Flipped Classroom is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment (Flipped Learning Network; 2014) and the technology is entirely integrated in the learning and teaching process.

The project called "Project of Flipped Classroom's incorporation" that was born in order to implement and evaluate the Flipped Classroom model in Primary schools and Teacher Training in Higher education. This study aims to identify the changes observed to incorporate Flipped Classroom in the five variables of the model of teaching: teaching strategies, learning strategies, content and materials, management of classroom and assessment.

To identify these changes, this research involves the participation of students and teachers of three Primary schools in Barcelona, students and Professors of Blanquerna Faculty of Psychology, Educational Sciences and Sports Sciences. (Ramon Llull University). All of them have answered a questionnaire and focus group.

The results show changes when teachers use Flipped Classroom model in their classes five variables of model of teaching. Teachers use more interactive strategies, students use more collaborative strategies, teachers promote independence study of their students and personalized learning, access to educational material is easier as students and evaluation is continuous (the objective is the process).

In addition, there are benefits in the relationship between teachers and their students and the acquisition of generic skills such as learning to learn.

In conclusion, Flipped Classroom is a model of the digital age adapted to the new needs, new ways to learn and how to communicate in Primary school as a Higher education. Therefore, we can promote new models of shared learning.

Keywords: *education technology, flipped classroom, blended learning*

1. Introduction

Nowadays, there are many studies that show the changes occurring in the educational world. Reports such as, Horizon Report (2013) that presents the trends in education of the 21st century and consequently the challenges that must be considered.

The focus of many of these challenges refers to new ways of learning needs and learners 21st century. This is a new paradigm that as stated by Siemens (2008) in his theory of connectivism, there is a need to review the actual models to enhance new teaching and learning strategies in order to meet the challenges of the digital age.

In this new age, it has been shown that students are digital natives (Prensky, 2001) and have new needs that have to be answered. Therefore, we must find new models of educational transformation that will fulfil the needs of these new generations. A new model like the Flipped Classroom (Bergmann & Sams, 2012) where the strategies of teaching can be more interactive; learning strategies are

implemented in environments of collaboration and creativity; content and materials are real and adapt to new digital formats; responsibility and classroom management can be shared with students and it is not only centralized. Moreover, a model where the teacher evaluation takes into account the progress of the student. In short, a model that breaks with the traditional model, as the Flipped Classroom does (Tourón et al, 2014).

The Flipped Classroom model also allows us to reverse the order of the Revised Bloom's Taxonomy (Lopez, 2002): students work independently lower order skills and then, in the classroom together with their colleagues working higher order skills. This allows students to carry out activities of analysis, evaluation and creativity.

Thus, our students will develop all the skills required in the 21st century under a personalized learning model (Adell & Castañeda, 2013).

The Flipped Classroom is a model that places the student at the centre of learning and the teacher becomes a facilitator and a guide of their students. In the Flipped Classroom, the time traditionally used in the classroom to explain the contents and bring the students to the fundamental ideas of each unit moving activities outside the classroom, students can access information and content provided by the teacher outside the classroom and in the classroom they develop activities and tasks from a collaborative work. On the one hand, teachers have more time in the classroom to work with students and to understand their needs and skills in order to adapt better and more personalized forms of learning. In addition, students have the opportunity to ask questions and solve problems with the guidance of their teachers and the help of their classmates in a collaborative work environment (Tourón et al, 2014).

In this regard, a study conducted in 2000 by Professor Glenn Platt of the University of Miami along with Professor Maureen Lage corroborates the Flipped Classroom is a method that is changing the traditional model of class and a methodology of educational innovation. As a result, if you move to the context in which the school was doomed to a very fast transformation, it highlights the need to observe, analyse and support for the system in general and teachers in particular can take advantage of all the knowledge of the best experiences, practices and results, and consequently check whether models like the Flipped Classroom enable innovative learning processes.

Therefore, the aim of this study is to identify the changes observed to incorporate Flipped Classroom in the five variables of the model of teaching: teaching strategies, learning strategies, content and materials, management of classroom and assessment.

In summary, the final objective of this study is to confirm that the Flipped Classroom model involves innovation in education field.

2. Methods

This research "Project of Flipped Classroom's incorporation" is based on action research that started in September 2014. In July 2015 this project will be evaluated with a view to improving and re-implement it throughout the year 2015/16.

The assessment is based on two types of instruments: questionnaires and focus groups. Questionnaires have replied to the students of the Faculty of Psychology, Education Sciences and Sport Blanquerna Ramon Llull University in Barcelona (Spain) the degree of teacher education and to the students of primary education. Focus groups have participated teachers and students of primary schools.

Specifically in this paper, we provide results of the data collected so far, referring to students of primary grade teacher with a sample of 36 students from different subjects from grade teacher in primary education have invested some its contents and who responded to the questionnaire addressed to them. Of these 72.2% are women, and 27, 28% are men. Their average age is 24 years.

The type of statistical analysis is done based on descriptive statistics and analysis of the questions in the questionnaire will be made based on the following dimensions:

- Flipped Classroom Model
- Changes in the educational model in relation to:
 - Content and materials used
 - Teaching and Learning Strategies
 - Classroom Management
 - Evaluation

These data will contrast with the results obtained only in one primary school Collaso and Gil of Barcelona (Spain). In this case, there is a sample of 39 children from the fifth year of primary education compresses aged between 9 and 11 years of which 16 are girls and 23 are boys.

3. Results and discussion

3.1. Changes in the educational model in relation to the content and materials used

College students consider it very or fairly easy to find and access the materials that have provided self-learning with a percentage of 97.3% and primary school students consider a rate 82, 1%

Regarding the pace of learning, college students with a percentage of 91.6% believe that online materials allow them to work at their pace, or rather, while among primary school students, the percentage of 87.1%

University students consider the material created have learned when they used the material created to work autonomously in a flipped classroom model and so manifested as 88.9% said they have learned a great deal or quite this material. On this issue related to the use, saying that primary school students believe they have learned quite a lot or 97.5%, although the students often find it difficult to work independently with the materials and 30, 8% said they have had enough difficulties and even 12.8% state that has cost materials to understand. In fact the focus groups to primary students said that have thanked classmates or teacher when they had difficulties with self-learning.

3.2. Changes in the educational model in relation to strategies for teaching and learning

The various questions that refer to the teaching model, we noted that 88.7% of the students refer to the Flipped classroom foster collaborative work which 94.4% very or fairly valued the teacher becomes a guide learning rather than the person who supplies the content and 97.2% of college students surveyed highlight the active role of the student work with flipped classroom.

Students from elementary school consider that with Flipped classroom they work more with their peers by 85% and peers to help them resolve questions lot or quite a 82%. Also, the result of the question about participation in class, students of primary school believe that with flipped classroom they have worked and participated more in class with a percentage of 94.8

Finally, college students valued fairly or very flipped classroom model that promotes independent working skills in 72.2%

3.3. Changes in the educational model in relation to classroom management

This dimension has been worked with college students who will be teachers in the future. The results emphasize some of the questions in table format

Table 1. Classroom management when used according Flipped Classroom students

Questions	Nothing	Little	Fairly	Very
The Flipped Classroom allows better attend the diversity of the classroom	0%	13.9%	52.8%	33.3%
The Flipped Classroom activities are more interactive	0%	2.8%	27.8%	69.4%
Time management respects the different learning rates	2.8%	8.3%	55.6%	33.3%
There is more interaction with the teacher in the classroom	0%	11.1%	27.8%	61.1%
There is more interaction with classmates in the classroom	0%	11.1%	27.8%	61.1%

According to the results, there is a high percentage of students who consider Flipped Classroom greatly improves the interaction between students and between students and teachers and also are more interactive activities

However a high percentage of students (close to 50%) consider that the Flipped Classroom respects quite different learning rates and can better attend the different needs in the classroom.

3.4. Changes in the educational model in relation to the assessment

100% of students consider using a flipped classroom model evaluation is more than a test and believe the flipped classroom using other evaluative systems.

Table 2. Comparison between the results of college students and students of primary schools about the different assessment systems with Flipped Classroom

	College students				Students of primary			
	Nothing	Little	Fairly	Very	Nothing	Little	Fairly	very
Self assessment	2.8%	5.6%	36.1%	55.6%	38.5%	10.3%	30.8%	20.5%
Peer assessment	0%	2.8%	44.4%	52.8%	10.3%	74.4%	128%	2.6%

The results of college students are different of the results of students of primary. College students want to use evaluation systems such as self or peer assessment, however the primary school students the opposite.

Surely the reason of these results is because the university has more variety of students and subjects. Instead, school “Collaso i Gil” have less activities. When we have all data, it will be necessary to check all the results of the three primary schools.

3.5. The Flipped Classroom model: advantages and disadvantages.

The positive aspects of the Flipped Classroom according to college students are this model improve learning, is motivating and helpful to the student, more practical, and has a great future in schools, etc.

In relation to the negative aspect, the college students are concerned: universal access to technology, lack of self habits of work, not forget the diversity of students, the situation in that students do not work at home before going to class, the necessary involvement of families, increased the workload of the teacher, etc.

While the students of primary would emphasize their concern for the quality of the videos and understanding, as well as search media when watching them.

To compare the final assessment, it must be remembered that the question to students of primary was closed and the question to college students was open. Therefore, the students of primary assess Flipped classroom with an average of 9,03 and college students between good and very good.

4. Conclusions

The first conclusion is about Flipped classroom, because this model has the approval and support of university students and primary school students, though also highlights areas for improvement. This model is well adapted to students considered digital natives.

In the other dimensions studied, most of the responses also point to the Flipped Classroom is positively evaluated except the assessment where there are differences between answers of college students and students of primary.

Thus, this study corroborates the Flipped Classroom is an innovative educational model that involves changes in the five dimensions of teaching model and conforms to the needs of learning and communication with the limitations of the present study that some of the data are not yet collected at the moment.

References

- Bergmann, J., & Sams, A. (2012). Flip your classroom: reach every student in every class every day. Eugene, OR.; Alexandria, VA.: ISTE ; ASCD.
- Castañeda, L. y Adell, J. (2013) Entornos personales de aprendizaje : claves para el ecosistema educativo en red. Alcoy: Marfil
- Johnson, L., Adams Becker, S., Cummins, M., Estrada, V., Freeman, A., & Ludgate, H. (2013) NMC Horizon. Report: 2013 Higher Education Edition. Austin: The New Media Consortium.
- López, J.C. (2002). Disponible en: <http://www.eduteka.org/TaxonomiaBloomCuadro.php3>

- Platt, G. J. (2000) "Inverting the Classroom: A Gateway to Inclusive Learning Environments." with Prof. Maureen Lage and Prof. Mike Treglia. *Journal of Economic Education*, Winter 2000, Vol.31, No.1.
- Prensky, M. (2001). Nativos Digitales, Inmigrantes Digitales. *On the Horizon*, 9(6), 1-7.
- Siemens, G. (2008). About: Description of connectivism. *Connectivism: A learning theory for today's learner*, website. <http://www.connectivism.ca/about.html>
- Tourón, J.; Santiago, R.; Díez, A. (2014). *The Flipped Classroom: Cómo convertir la escuela en un espacio de aprendizaje*. Digital-Text.

DEVELOPMENT AND INNOVATION OF FREE ONLINE EDUCATION SYSTEM, "JMOOC" IN JAPAN

Kaori Ishibashi¹, Suguru Yanata² & Takao Nomakuchi²

¹Wakayama Shin-ai Junior and Senior High School (Japan)

²Faculty of Economics, Wakayama University (Japan)

Abstract

Development and diffusion of ICT makes innovations in education. The free and publicly accessible online educational system called MOOC (Massive Open Online Courses) is one of them. Now, people can take free education course such as Harvard University, Stanford University and Massachusetts Institute of Technology (MIT) by utilizing platform for MOOC such as Coursera and edX. These systems enable people to take classes without entering to the university and school fee. At the same time, they also enable people to overcome educational inequality only by ICT tools such as PC or smart phone.

MOOC started in United States, and spread all over the world, for example Spain, China and Japan. In Japan, MOOC started as "JMOOC" (Japan Massive Open Online Courses), and top-level universities such as Tokyo University, Kyoto University and Kyushu University started free educational course.

This study aims to clarify tasks and essential points for development of MOOC considering that development of MOOC can enhance educational standards in the global society and can solve educational inequality. This study also picks up some reference cases for the latter countries and companies and examines about approaches and characters of JMOOC in Japan.

This study becomes clear as below.

- Although JMOOC has gradually spread, the number of entering universities and companies are fewer than that in United States, and the system hasn't been established completely yet.
- Development of MOOC can enhance educational standards in global society and can solve educational inequality. That's why academia – industry should support its development.
- In United States, the 90% of participants stop taking lectures in the middle. The measures to take lectures continuously are needed, because this problem may happen in JMOOC too.
- It is difficult to measure the learning effect in MOOC, which is the same problem to other online lectures.
- Development of the business model is needed for continuous development of MOOC, but entering companies bear the cost now. Collaboration among industry, academia and government is important now as the dawn.

Keywords: *Massive Online Course, Educational Innovation, Online Education, Educational Policy, Industry-Academia-Government Collaboration*

1. Introduction

Development of technology has made civilized society rich and easy to live. And these days, development and diffusion of information communication technology(ICT) makes innovations in education. The free and publicly accessible online educational system called MOOC (Massive Open Online Courses) is one of them. MOOC started first in U.S. in 2012, and now, people can take free educational system such as Harvard University, Stanford University and Massachusetts Institute of Technology by utilizing MOOC's ICT platform such as "Coursera" and "edX". These systems enable people to take course without course expense and entering to the university. At the same time, they also enable people to overcome educational inequality only by ICT tools such as PC or smart phone. This is very important innovation in modern social education.

MOOC started in United States, and spread all over the world immediately, for example Spain, France, China and Japan. In Japan, MOOC started as JMOOC (Japan Massive Open Online Courses) in 2013, and top-level universities of Japan such as Tokyo University, Kyoto University and Kyushu

University started some courses. These days, local middle and small universities start to offer JMOOC some courses contracting with famous specialists in order to advertise their universities.

This study aims to clarify tasks and essential points for development of MOOC considering that development of MOOC can enhance educational standards in the global society and can solve educational inequality. This study also picks up some reference cases for the latter countries and companies and examines about approaches and characters of JMOOC in Japan.

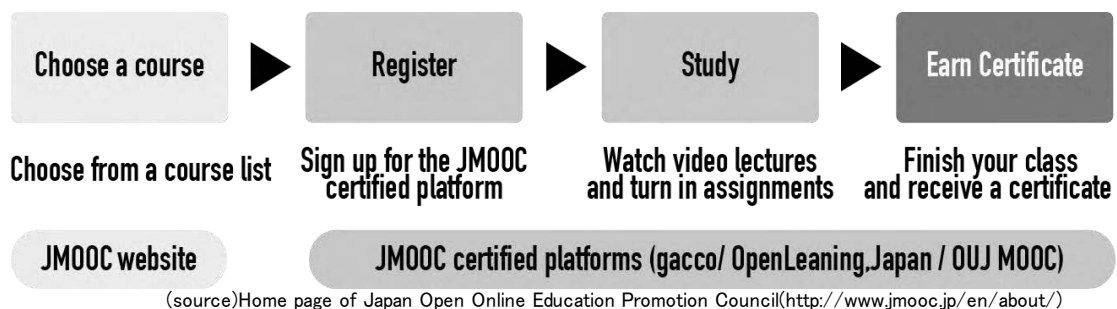
2. JMOOC

JMOOC has been increasing the number of courses since they started their service in 2014, 60 courses have already started by first half in 2015. Although some universities open their famous specialists' classes to public to advertise themselves, such causes contribute to educate a people. Now, the number of JMOOC users is over 300 thousand, and JMOOC becomes known to the general public gradually.

People can use JMOOC utilizing ICT platform for JMOOC, for example "gacco", "OpenLearningJapan", "OUJ MOOC". "gacco" is offered by NTT Docomo and NTT Knowledge Square, OpenLearningJapan is offered by NetLearning, and OUJ MOOC is offered by the Open University of Japan. JMOOC will be the internet portal that utilizes these multiple platforms.

According to homepage of The Japan Open Online Education Promotion Council, JMOOC system is explained as below. When people want to take courses through JMOOC, first, people need to choose a course from a course list. Second, people need to register courses through JMOOC certified platform. Then, people can take online classes. After people finish their course, they can receive a certificate.

Figure 1. Structure of JMOOC



People will be required to watch 5-10 course lectures each week. Each lecture is shown in a video, and upon completing each video they will be required to take a quiz to test their knowledge. There will be 5-10 such sets each week they take the course. Upon completing a week's worth of learning, they will get that week's assignment, which they will have to turn in before the submission deadline. That is what a week's worth of coursework involves. If they will complete that course by turning in the cumulative and comprehensive assignment at the end. When the weeks' and cumulative assignments are scored and they have fulfilled the requirements, they will get a certificate of completion. They can study wherever they like if they have tools such as PC connecting internet, which is the same as MOOC in United States of America.

Although it is an online course, if you have any questions or discussions you would like to raise relating to your study, you can always use the online message board. In addition, if you wish to have discussions with other students, you can set up meet-ups on the message board and call other students to join. With some courses, you will be able to engage in face-to-face flip learning with the professor giving the lectures in the videos. (Flipped Learning).

3. MOOC and JMOOC

MOOC is revolutionary and innovative educational system in not only for United States of America but also Japan. However it has just started, so there are many tasks to solve. For example, the survey by the University of Pennsylvania, Graduate School of Education found that MOOC students from Coursera platform who could get a certificate of completion were 2 to 14 percent, average 4 percent. In addition, half of registered students didn't watch any videos. This is a task to solve from now.

About this task, completion ratio of JMOOC is by far higher than that of MOOC. For example, completion ratio of first JMOOC course, history course of gacco was 18 percent. [NTT Knowledge Square (2014)] Besides, completion ratio of Flipped Learning Course was more than 80 percent. Associate professor Yuhei Yamauchi, who is in charge of developing manager of gacco from the University of Tokyo, Graduate School showed the reasons as below.

- To develop their courses referring to United States of America
- To make educational materials in Japanese for Japanese students
- The diligent character of Japanese students
- To have discussions on the message board and to set up meet-ups
- To conduct Flipped Learning Course

However, if JMOOC can't increase the number of course and diversify contents, it may not be able to keep high completion ratio in the future. This is because only highly motivated people take classes now. In order to expand JMOOC students, it is important to prepare courses to motivate more students.

A task of JMOOC is that the number of course is not enough, though the number of course is gradually increasing. Compared with United States of America, the number of educational institutions such as universities which set up courses in Japan is by far less. Only about 60 courses are available in 2015. The number of courses is equal to the number of contents. The lack of contents cause to decrease the number of students, which has already revealed from the past experiences of information and service industry. That's why JMOOC have to deal with this task as soon as possible. The second important point is industry-academia collaboration. JMOOC is an open service, but it needs to improve as a business model. So it is important to strengthen industry-academia collaboration until a business model is established.

In addition, JMOOC costs a lot. This is the common task between Japan and United States of America. Now, most educational institutions such as universities pay cost to start JMOOC by themselves. This is because JMOOC is an educational course and difficult for getting profit by advertising companies' products and services. This restriction of business model reduces the number of universities which offer JMOOC contents. Only public universities such as national universities, universities which have excess funds or which has famous professor who can increase the number of test-takers. JMOOC has just started so funding is a main task. In the future, it is required to make business model to spread JMOOC.

Completion not always means that educational effect is enough. Online lecture is the main way to study in MOOC, so it is difficult to measure effectiveness correctly. The way of effect measurement should be also improved.

4. Potential of Online Education

MOOC has various potential as this theses show. To sum up again, MOOC is online education system for free. Everyone can take courses wherever they want if they have Internet environment and standard PC.

This is a high potential, innovative social educational system than people expect. There are many people who can't take classes because of residence, working hours and money. Even such people tend to have smartphone or PC these days. In addition, free access service to Internet such as Free Wifi in town is spreading. Although MOOC can't give people academic background, but it can give them opportunity to study.

To interpret it widely, MOOC can be used to support for developing countries in educational section. For example, sometimes buildings such as schools was built by development assistance, but there was no enough number of teachers in that area, so that buildings wasn't used. In such case, if a few PCs whose cost drops dramatically are introduced for MOOC, it can support teaching. In some cases, it will be enough support to give network instead of making buildings. That means that each support cost will drop and the number of projects people can support will increase. This enables us to offer developing countries people the latest education.

In this case, it will be a task how to make educational materials to study in local area. About language matter, it is easy to make educational video materials in that countries' language. In some case, it is possible to take English course first, then to let people take another cause. About recognition of history and other facts, it can be solved by contacting with local specialists. Therefore MOOC has possibility to make a revolution in educational supportive action of development assistance. Thus MOOC can reduce social inequalities and develop civilized society.

Of course, MOOC will be used other scene too, but we would like to focus on these points.

5. Conclusion

This study becomes clear as below.

- Although JMOOC has gradually spread, the number of entering universities and companies are fewer than that in United States, and the system hasn't been established yet.
- Development of MOOC can enhance educational standards in global society and can solve educational inequality. That's why academia – industry should support its development.
- In United States, the 90% of participants stop taking lectures in the middle. The measures to take lectures continuously are needed, because this problem may happen in JMOOC too.
- It is difficult to measure the learning effect in MOOC, which is the same problem to other online lectures.
- Development of the business model is needed for continuous development of MOOC, but entering companies bear the cost now. Collaboration among industry, academia and government is important now as the dawn.

References

Japan Open Online Education Promotion Council.(n.d).May 10, 2015, <http://www.jmooc.jp/>
NTT Knowledge Square(2014). JMOOC kouninsaito[gacco]no daiichidankouza de jukousha no 18% ga shuuryou hantengakushucourse deha 80% ga shuryo, June 14,
http://nttks.co.jp/news/news_20140620.html#pagetop

CONSTRUCTING KNOWLEDGE WITH NEW INFORMATION AND COMMUNICATION TECHNOLOGIES

**Marcelo Mendonça Teixeira, Walter Felipe dos Santos, Hugo V. L. Souza, Fábio Lopes Bione, Josival dos Santos Silva, Hugo Pazolline B. dos Santos, Demétrio A. de Santana, Gilberto Cysneiros, Ivonaldo Torres, José Eduardo de Lima Cruz
& Joel A. de Lima Júnior**

Department of Statistics and Informatics, Federal Rural University of Pernambuco (Brazil)

Abstract

The information society has become a natural stage in the evolutionary and social development of people, from a world increasingly interconnected by new technologies. This process belongs to a cycle that is based on the assumption that new technologies applied to education would solve all time, distance and transport issues, although never dissociated from traditional teaching methods. Today, more than ever, educational institutions are making intensive use of technological resources in virtual learning environments, favoring a collective intelligence on the educational domain and cooperative learning, and producing a cyberculture on the network society. Thus, the main activity to be developed by educommunicators is to advise these institutions on the use of technology in education as a didactic support. This process belongs to a cycle that is based on the assumption that new technologies applied to education would solve all time, distance and transport issues, although never dissociated from traditional teaching methods. Besides that, due to the similarity of its basic characteristics, it is common for the academic community to confuse the Podcast with the Web Radio. The present paper features a conceptual approach concerning the foundations of the Web Radio and the Podcast, showing the main theoretical and technical differences between the concepts. Beyond this literature review on the concepts described, this investigation considered it important to analyze the educational potentialities of the Podcast and Web Radio for the academic universe.

Keywords: *Information and communication technology, online education, web radio, podcast.*

1. Introduction

The educommunicative paradigm online requires a new way of thought about the pedagogic models and new intervention strategies in society, which are able to respond to contemporary education. Web Radio and Podcast are vehicles of mass communication that have undergone many changes over the years through the development of informatics and cybernetics. In turn, the education has been used in the new technological resources to produce educational programs that are multidisciplinary in several areas of knowledge and in different parts of the world, with a proposal of rupturing from the traditional educational model based on a linear transmission of knowledge (Teixeira, 2013). Social communication has always performed a significant pedagogical role, something that has already been thoroughly investigated and it is known to have roughly two separate moments: A moment of open pedagogy, entertainment and leisure fulfillment as its main activity; and another when the media decide to broadcast a specific form of knowledge organization (Moran, 1994). Hence, the main activity yet to be developed by educators is to advise educational institutions on the use of new technologies as a didactic support, promoting and spreading their educational applications inside and outside classrooms.

These new interfaces brought facility of access to communication by the increase of storage capacity of news and by the processing speed of information in real time, promoting their educational applications inside and outside classrooms, with the possibility of sharing and storing contents in audio, video, image or text. When it comes to net media that develops “sociocultural activities” for informal and non-formal education, they almost always include formal programs when oriented directly to the school’s curriculum (Teixeira, 2013). That is the case of Podcast representing a valuable space for the popularization of information, education and the socialization of culture, and that can be accessed at anytime and anywhere in the world. The Podcast no more is seen simply as an informative interface, but as a pedagogical and methodological component to be used in teaching and learning. The relatively recent

development of the digital era has spawned interest in what has come to be called “virtual reality” and in delineating what this means for learning and creation of virtual learning environments. Therefore, communication gains a major role in knowledge building, turning the educational act into something more dynamic and appealing. After this brief introduction, we’ll see the concept of Web Radio and Podcast.

2. Objectives

The present paper features a conceptual approach concerning the foundations of Web Radio and Podcast, showing the main theoretical and technical differences between the concepts. Beyond this literature review on the concepts described, this investigation considered it important to analyze the educational potentialities of the Podcast and Web Radio for the academic universe.

3. Methods

The present paper features a conceptual approach concerning the foundations of the Web Radio and the Podcast, showing the main theoretical and technical differences between the concepts. Beyond this literature review on the concepts described, this investigation considered it important to analyze the educational potentialities of the Podcast and Web Radio for the academic universe.

4. Discussion

4.1. The Concept of Web Radio

The Web Radio or e-Radio can be defined as the radiophonic emission on the Internet in real time, usually in audio formats (MP3 or MP4, OGG Vorbis, WebPlayer, Real Audio, Windows Media Audio and HE-ACC). Different from traditional radio, your transmission could be followed by images, videos, texts, pictures and links. This advance allows the listener to do much more than just listen, making communication much more dynamic. Currently, it is possible to conduct online education, offering didactic material in PDF files or Word documents, video, podcast, and have access to up-to-date information through the RSS feed, clear up doubts with the instructor / educator through messenger, e-mail, chat, twitter, forums, as well as the interactivity in real time, through audio-conference or video-conference. It is about the combination of various elements: Ubiquity; flexibility; low cost; emission in real time; synchronous and asynchronous communication; multi-directed connectivity; multimedia sharing; streaming; collaboration and the interactivity integrated with e-learning. Often, the online reproduction of hertz signal through codification in the personal computer, through streaming, reproduces the emission on the Internet. The data is sent from PC packages for audio, video, text, images for Internet, which are stored on the platform online and made available to the public, which has access to a range of interactive resources. Says Nair Prata (2008) in Teixeira (2013), that the Web Radio is nothing more than digital radio with support of the Internet, which allows the presence of audio, video, text, and promoting the emergence of new genres and new forms of interaction. Thus, the main differences between traditional radio and Internet radio are the ways of accessing radio: By the computer; the flexibility of synchronous and asynchronous programming; geographical coverage (from local to global); the quality of emissions (without interference or noise), and active participation of the public. The user not only listens, but reads, writes and assists the programs of radio, having at their disposal a set of integrated interfaces. Finally, the interactive multimedia together with the audio in virtual environment is the essence of what has been called “Web Radio”, which has the potential advantage of network, enriching its programming with multimedia content and additional resources, allowing a constant interaction transmitter-receptor.

In some countries, the web radio is being used as an educational interface in virtual learning environments responsible for the divulging of various cultural activities on schools or universities, with programs dedicated to music, theater, cinema, education, science, technology, politic, poetry, literature, economy, news and transmission of popular festivals. At the present time, the web radio university, develops its activities based on the following categories: The formative, the informative, the academic and the cultural-educational. The formative category is established through periodic courses of formation and recycling for speakers, editors/speakers and technicians, besides the realization of didactic programs in collaboration with public and private institutions; the informative category is a space focused on debate and news of university; the academic category dedicates an ample space in its program grid to academic life, transmitting the main occurrences of the learning institution; at last, the cultural-educational category is responsible for the divulging of various cultural activities in the university (ibidem). It is this way, university web radios, functioning as a social communication vehicle of local communities and as a

valuable space for the divulgation, socialization and popularization of science and technology, produced by different departments at the teaching institutions. This way, the educommunicative potentialities of the web radio started to be found by lecturers, school managers, educational institutions and university radios, based on successful experiences with the use of the interface, producing cultural practices. In Spain or Portugal, for example, the university broadcasters have been converted into real alternatives to the big generalist radio stations programming, extremely motivated by a huge expertise and homogeneity which prevails in relation to the contents to which they refer. The Spanish academic radios clearly have a heterogeneous offer, in which programs of educational and instructive character are mixed with others exploring different genres and formats. Consequently, emerges a range of options, in which topics are dealt under different approaches that are dominant in the conventional model, favouring the development of a critical and solidary perspective. Taking advantage of the Internet interactive potentials, university radio stations seem to demonstrate a certain sensitivity in ensuring the rights of access and participation, something that has been increasingly neglected in other communicative fields, says Teixeira (2013). Hence, the main activity yet to be developed by educators is to advise educational institutions on the use of New Technologies of Information and Communication as a didactic support, promoting and spreading their educative applications inside and outside classrooms.

4.2. The Concept of Podcast

A new sociability behaviours promoted new ways of technological development, changing, shifting and creating unusual relations between Man and information and communication technologies. This was exactly what happened at the turn of the 20th century to 21st century when many revolutionary network communication electronic devices were developed. As a consequence of globalization and technological growth, the subsequent multiculturalism established a new social structure, consisting of different kinds of people and corporations, guided by interactions, collaborations and knowledge exchange in the newly adult virtual universe. On this matter, Paul Virilio calls attention to the temporal dispersion and the loss of sense of reality in cyberspace, some kind of an atopy to the digital natives, deeply absorbed by a great amount of endless information. The Podcast being used as an educational interface in virtual learning environments responsible for the divulging of various cultural activities on schools or universities, with programs dedicated education, culture and entertainment.

The term "Podcast" results from the junction between the iPod (equipment developed by Apple and that plays MP3) and Broadcast (radio). When the multimedia content has a large volume of information, the files of Podcast are generally compressed for both storage and streaming of audio and video on the web, to be accessed using any computer, operating in different systems (Microsoft, Linux or Macintosh). Anyone can create a Podcast. All over the world, people are creating Podcasts on subjects ranging from movies, to technology, music, politics and whatever else you can think of. This is new original content made by passionate people who want to share their creativity with the world. The cost to start podcasting is so low that anyone can do it. Most podcasters are everyday people like you and me. They could be talking to you driving in their car, sitting in their living room or speaking at a conference. You get to glimpse into their life and into their interests. Podcasters are creating very raw and real content and listeners are responding. Free from corporate radio and broadcast regulations, you can create whatever kind of show you can imagine (Brown & Green, 2011).

To Sheila Scutter, Ieva Stupans, Tim Sawyer and Sharron King (2010), podcasting is used commonly recreationally and is now increasingly used in education. The technology for podcasting is readily available, easy to use and inexpensive, making it an attractive option for providing additional flexible learning resources for students. However, little is known about how Podcasts are used by students and the implications for learning. This paper describes how Podcasts were used by students in a medical radiation program. In common with many other health science programs, the medical radiation program has a large content load, particularly in first year where courses such as anatomy and physiology are introduced. Students generally used Podcasts to review lecture content, especially when they had difficulty with understanding lectures or new terminology. Students generally listened to the recordings whilst viewing the lecture powerpoint presentations on a home computer, affirm the authors. There are three perspectives in educational podcasting, say Harris and Park (2008) in Ana Amélia Carvalho (2009): (i) the perspective of lecturers—they facilitate to emphasize the information which lecturers feel to be critical for their students. It enables direct communication and interaction with students which goes beyond temporal and spatial limitations of conventional face-to-face education (ibidem). (ii) The perspective of students—it enables repeated learning and offers an opportunity for the effective use of time. (iii) The University's perspective—podcasting is a communication enabler, reaching out to a wider community. Podcasts may be used to deliver course materials or provide additional resources for students, providing the potential to allow lecturers to focus on interaction. Functionalities such as pause, forward or skip mean that the user is in control of the pace. Students may be attracted to the new format (ibidem).

In general, we believe that the radio web use as an educational interface has been significantly expanded throughout the world, though there is still a lack of a solid theoretical and methodological basis. In this sense, it becomes evident the need to more fully investigate the teaching and learning process through the Web Radio in educational institutions. In the Portuguese case, more specifically, it is crucial to deepen studies on the academic radio educational and training potentials and their contributions to the country. In the contemporary context, exploring Web Radio educational potentials seems to be a new challenge for educators (Teixeira, 2013). The use of ICTs in education is related to the revolution on the communication. Old education methods are being remodeled to absorb the benefits of the Web 2.0 tools. This new resource allows interaction and information exchange, and consolidates the teaching/learning process. The use of these tools on education opens a variety of possibilities for the teachers and students. However, this study showed that many teachers still don't know the term Web 2.0, and the ones who know, don't use because of lack of knowledge about how to use them correctly. In the end of the research, became evident that, once the teachers are presented, directed and trained to use correctly the Web 2.0 tools, they will be inclined to use these new teaching methods on their educational practice. So, the main result of this study was the conception of good practices to the use of the web 2.0 tools on education. In light of this context, is necessary to improve the initial formation of the teachers with knowledge about these tools, encourage them to retrain and motivate them to use these tools on their classes. This will result on new pedagogical practices that allows a smarter teaching.

5. The Difference between the Concepts

The interactive multimedia together with the audio in virtual environment is the essence of what has been called "Web Radio", which has the potential advantage of "network", enriching its programming with multimedia content and additional resources, allowing a constant transmitter-receptor interaction that cancels the linearity auditive or visual. Like electronic games, the entertainment is only part of the history of Web Radio and Podcast, becomes an attractive technology in different areas of knowledge, including the Education. Thereby, the educational institutions can through Web Radio and Podcast offer educational materials with different themes in video, audio or image, which will be provided in the virtual environment and can be accessed remotely at anytime and anywhere in the world. Finally, the interactive multimedia together with the audio in virtual environment is the essence of what has been called "Web Radio", which has the potential advantage of network, enriching its programming with multimedia content and additional resources, allowing a constant interaction transmitter-receptor, says Perona Pérez (2009) in Teixeira (2013). Observe the difference between the concepts in Table 1:

Table 1. Features of Podcast and Web Radio

Features	Podcast	Web Radio
Interactivity in Real Time	No	Yes
Feed RSS	Yes	Yes
Streaming	Optional	Optional
Interactivity Resources	No	Yes
Asynchronous and Synchronous Interface	No	Yes
Contents in Audio, Video, Image and Text	No	Yes
Video/Audio On Demand	Yes	Yes
Integrated in the Learning Platforms	Yes	Yes
Open Source	Yes	Yes
Educational / Commercial Technology	Yes	Yes

But the main difference between the two interfaces is the support of other media interfaces in its operating structure. For example, other media can be integrated within the platform of web radio, unlike the podcast. And this is directly related to the possibility of interaction between the transmitter and receiver at the time of use. Moreover, few characteristics are consistent between the interfaces. To Teixeira (2013), the process of digitization suffered by conventional broadcasters and the availability of its content on the Internet, produced the latest step in the recent history of media - the Web Radio. In turn, the education has been used in the new technological resources to produce educational programs multidisciplinary in several areas of knowledge and in different parts of the world. Due to its

characteristics, the podcast plays a key role in asynchronous access to information, introducing a total flexi-time access to content and collaborative sharing in cyberspace. The new technological supports brought the facility of access to information, namely by the increase of storage capacity, by the processing speed and by the compatibility between the systems, creating a culture of flexibility. "Podcasts offer obvious opportunities for distance learning" (Copley, 2007, p.388). This was the main reason mentioned by respondents of survey, when asked why they did choose the podcast: "flexibility to access the contents in any time or any place in real time". Although similar, but with distinct features, the web radio and the podcast are complementary, for the sake of interactivity, ubiquity and flexibility, representing to the user the ease of access to information, culture and entertainment.

6. Conclusions

The virtual environments can be considered as one of the factors driving the transformation of mass media, associating new forms in network communication and becoming the information more accessible to any person that has access to the worldwide network of computers, promoting the production and dissemination of information in science and technology for teaching and research in all areas of knowledge and different sectors of society. This is it the communicability and sociability of people with the virtual world. The universities and schools through a Web Radio can provide educational programs in Podcast with different themes for different courses or areas of knowledge, which will be available online and can be accessed at anytime and anywhere in the world. Through this technological resource, there is no possibility of losing the program if the person is busy, the programs are available online and can be accessed when necessary or possible. Podcast integrated in the Web Radio brought the ease of access to fast information and collaboration between people around the world. It is shown in this paper, we find that the Web Radio and podcast media are distinct, each with its own characteristics and peculiarities, which are complementary towards interactivity, flexibility, collaboration and ubiquity. Working together or separately, they produce information, entertainment and knowledge in the virtual environment. For online education, the interaction between both interfaces represents a valuable space for the dissemination, popularization and social knowledge, allowing the student access to educational content at anytime and anywhere in the world, establishing a new channel for communication in the virtual universe. Communicating is not just say what you want to convey, how to convey things is crucial, and differs from one person to another. Communicating is much more than sharing information (in written, oral or electronic form), it is understanding each other, a creative act based on the invention of new knowledge. To understand the communication results in the perception of human relations in a process involving the personalities, stories, feelings, values and ways of seeing the world, which causes changes the way individuals in society feel, think and act. In theoretical terms, it is possible to assert that interfaces of "Web Radio" and "Podcast" share similar objectives, with different structures of action, dedicated to the promotion and divulgation of culture, education, science in the educational institutions, representing, at the same time, a strong cultural intervention in the local communities, as well as a alternative for people's formation.

References

- Brown, A. & Green, T. N. (2011). *Video podcasting: When, Where and How it's Currently used for Instruction*. Consulted in 10 December 2010. Available in: http://www.ahbrown.com/aect/podcasting_brown_and_green.pdf
- Carvalho, A. A. (2009). *A taxonomy of podcasts and its application to higher education*. Consulted in 10 December 2013. Available in: http://repository.alt.ac.uk/638/1/ALT-C_09_proceedings_090806_web_0161.pdf
- Copley, J. (2007). Audio and video podcasts for campus-based students: Production and evaluation of student use. *Innovation in Education and Teaching Internacional*, vol. 44, 4, November 2007, pp. 387-399.
- Moran, J. (1994). *Educação, comunicação e meios de comunicação*. São Paulo: FDE.
- Ieva Stupans, S., Sawyer, T. & King, S. (2010). *A blogger's blog: exploring the definition of a medium*. Consulted in 10 May 2014. Available in: <http://reconstruction.eserver.org/064/boyd.shtml>
- Teixeira, M. M. (2013). *A Rádio Web na Península Ibérica: Ambientes Educomunicativos no Ensino Superior. Contextos e Comparações de Uma Realidade Contemporânea*. US: Lulu Publish.
- Virilio, P. (1993). *O espaço crítico*. São Paulo: Editora 34.

THE TEACHER AS A MEDIATOR OF INTERACTIONS IN VIRTUAL LEARNING ENVIRONMENT: FOCUS ON DISCUSSION FORUMS

Ana Paula de Araujo Cunha & Beatriz Meggiato Oreques de Araujo

Department of Higher Education, Sul-Rio-Grandense Federal Institute of Education, Science and Technology (Brazil)

Abstract

This paper derives from a qualitative research whose scope encompasses issues concerning the processes of interaction and teaching-learning mediated by New Information and Communication Technologies (NICT). The investigation context is an online post-graduate course in Education, whose informant subjects are students and teachers from three centers of education. In this sense, the research corpus is derived from data obtained through the capture of the interacting members' posts in selected online discussion forums. More specifically, the research focus comprehends the teacher's role as a mediator in the discussion forums conducted in the Virtual Learning Environment, by identifying the categories and specific indicators of mediation, in the light of Garrison and Anderson's Community of Inquiry Model (2003). In this perspective, we investigate to what extent such categories, as constitutive of the elements named Cognitive Presence, Social Presence and Teaching Presence, promote teacher/student/content interaction, supposedly facilitating the collaborative construction of knowledge (cf. VYGOTSKY, 1934/2007-2008). In a general way, the analyzed data point to the hegemony of the teacher with respect to the mediation occurring in the investigated forums. It is also possible to identify significant clues in the matter of how mediation moves have promoted the maintenance and, sometimes, the interactive flow improvement, reiterated by the increase of the students' dialogical participation in the proposed debates.

Keywords: *Interaction, mediation, teacher, online discussion forum.*

1. Introduction

Technologies as extension of the human organism end up expanding the possibilities of contact between individuals through the technological mediation. However, this does not effectively ensure a dialogical relationship. Such a relationship will only happen if the interactivity functions and transcends the aprioristically idealized interaction. What should be done, then, so that the use of technology in education can develop a pedagogical mediation that allows meaningful learning?

Masetto understands pedagogical mediation as

the teacher attitude or behavior as a facilitator, encourager and motivator of learning, the one who has the willingness to be a bridge between the learner and his/her learning – not a static bridge, but a "moving" bridge, which actively contributes to the learner reaching his/her goals. (2000, pp.144-145)

Addressing the issue of Pedagogical Mediation and the use of technologies, Masetto (2000) points out that, as the process of learning includes cognitive and affective aspects, involving the development of skills and attitudes of students, the technology to be used should be varied and adequate to such goals. Moreover, the techniques will need to be consistent with the new roles of both the student and the teacher: strategies that strengthen the student's role as the active subject of learning and the teacher's role as a mediator, motivator and advisor in different learning environments.

The focus of this research lies on the teacher's role as a mediator in discussion forums held in Virtual Learning Environments (VLE), taking as context a post-graduate course in Education developed through distance mode. More specifically, we investigate the categories and indicators of mediation, by also considering the elements concerning the Cognitive, Social and Teaching Presences, within a Community of Inquiry (cf. Garrison and Anderson's Community of Inquiry Model, 2003). Furthermore, we seek to understand to what extent these elements promote teacher / student / content interactions, supposedly facilitating collaborative knowledge building (cf. VYGOTSKY, 1934 / 2007-2008). Such a model will be approached next.

2. Garrison and Anderson's community of inquiry model

According to Garrison and Anderson (2003), a critical and collaborative learning community has been central to higher education; because it is precisely through this that the creation of knowledge – reflective and collaborative individual process – becomes possible. In their studies, the way to understand the concept of collaborative learning follows, in a way, a strand linked to the socio-cultural-historical perspective, proposed by Vygotsky (1934/2007). In this sense, the researchers conceive such a concept as a social process of interaction, which occurs during activities within communities – scenario in which meanings are shared, negotiated and (co-) built, with the purpose of solving problems and generating knowledge.

Garrison and Anderson (Ibid) share the idea of Vygotsky (1934/2007), according to which there is an intrinsic relationship between the formation of the individual and the social world. This perspective of knowledge building as a collaborative social activity underlies the Community of Inquiry Model. Such a model was developed in order to understand the multifaceted components of virtual teaching and learning in collaborative construction of knowledge among students, in virtual environments of higher education, under the teacher's mediation. This learning model, called Community of Inquiry, takes as support the reflective inquiry approach to learning, by John Dewey (1933 - cited in Garrison & Anderson, 2003), which assumes that reflective thinking is the base of the learning process.

In the light of Garrison and Anderson's assumptions, a relevant educational experience is inserted into a Community of Inquiry, which is made up of teachers and students – key players in the educational process. The Community of Inquiry Model (CIM) presupposes that learning occurs within the community through the interaction of three key elements, namely: Cognitive Presence, Social Presence and Teaching Presence.

Garrison and Anderson, in order to improve the implementation, accuracy and order, grouped these indicators into categories (see Table 1), indicating more clearly, in this way, the phase or aspect of each element that was being shown by each group of indicators. This was also the form of procedure adopted in this study.

Table 1. Community of Inquiry Categories and Indicators (GARRISON and ANDERSON, 2003, p. 30)

<i>Elements</i>	<i>Categories</i>	<i>Indicators (examples only)</i>
<i>Cognitive Presence</i>	<i>Triggering event</i>	<i>Sense of puzzlement</i>
	<i>Exploration</i>	<i>Information exchange</i>
	<i>Integration</i>	<i>Connecting ideas</i>
	<i>Resolution</i>	<i>Apply new ideas</i>
<i>Social Presence</i>	<i>Affective</i>	<i>Expressing emotions</i>
	<i>Open communication</i>	<i>Risk-free expressions</i>
	<i>Group cohesion</i>	<i>Encouraging collaboration</i>
<i>Teaching Presence</i>	<i>Educational design</i>	<i>Setting curriculum and methods</i>
	<i>Discourse facilitation</i>	<i>Sharing personal meaning</i>
	<i>Direct instruction</i>	<i>Focusing discussion</i>

In the Community of Inquiry Model, the most likely element to promote success in higher education is the Cognitive Presence. Obviously, it is necessary to take into consideration the different contexts of learning as well as the adoption of computer -mediated communication for teaching purposes. The term cognitive presence is considered by the authors to mean the extent to which the participants in any particular configuration of a Community of Inquiry are able to construct meaning through sustained communication (GARRISON, ANDERSON and ARCHER, 2010, p.89). Cognitive presence is a vital element in critical thinking, a process and outcome that is often presented as the ostensible goal of all higher education.

The second major element of the CIM – the Social Presence – is defined as the ability of learners in the community of inquiry to project their personal characteristics, by presenting themselves to the other participants as "real people" (GARRISON, ANDERSON AND ARCHER, 2010, p.89). The fundamental importance of this element is its function as a support for Cognitive Presence, by indirectly facilitating the critical thinking process carried out by the community of learners. However, when there are emotional goals for the educational process as well as the purely cognitive ones, then the Social Presence is a direct contributor to the success of the educational experience.

The third element of the CIM – the Teaching Presence – consists of two general functions which can be performed by any participant in the community of inquiry (Garrison, Anderson and Archer, 2010, p.89). Nevertheless, in an educational environment, these functions tend to be the primary responsibility of the teacher. The first of these functions is the design of the educational experience. This includes the selection, organization and a first presentation of the course content, as well as the design and

development of learning and assessment activities. A teacher or instructor typically performs this function. The second function, facilitation, is a responsibility that can be shared between the teacher and some or all of the other participants or students. This sharing of the facilitation function is appropriate in higher education and common in computer-mediated education. Anyway, the Teaching Presence element is a means to an end – to sustain and enhance the cognitive and social presences for the purpose of obtaining educational / pedagogical outcomes.

3. Methodological Issues

This study derives from a qualitative research which uses Content Analysis as the main methodology for data treatment.

3.1. Research Context

The context of investigation comprehends a post-graduate course in Education developed by a Brazilian technological educational institute through the distance education mode (CPGEaD). Its main objective is to reflect on the occurrences of interactions mediated in Virtual Learning Environment (VLE). In this sense, the corpus of the research comes from data obtained through the capture of interacting posts in online discussion forums previously selected. More specifically, the research focus lies on the teacher's role as mediator in the discussion forums held in VLE (i.e., Moodle, in the case of the aforementioned course), by investigating the categories and indicators of mediation in the light of Garrison and Anderson's Community of Inquiry Model (2003). Within this framework, we investigate to what extent such categories, constitutive of the elements named as Social Presence and Teaching Presence, promote teacher / student / content interaction, by supposedly facilitating collaborative construction of knowledge (cf. VYGOTSKY, 1934 / 2007).

This study analyzes the discussion forum proposed in the subject matter entitled Post-modernity and the contemporary – Necessary expression: art, literature and philosophy. Such a forum was offered in May of the year 2011, through the Moodle platform, in three Brazilian municipalities namely, respectively: Rosário do Sul, Picada Café and Balneário Pinhal.

3.2. Research Informants

The informants involved in this research are the teachers of the subject matter whose forums were analyzed and their students from the three aforementioned municipalities. For ethical reasons, to preserve the anonymity of the research informants, teachers are referenced by the acronyms of T1 and T2. Teacher 1 (T1), besides being the author of the subject matter instructional design, was also the mediator of the forums of Rosário do Sul and Picada Café. Teacher 2 (T2), in her turn, was the mediator of the Balneário Pinhal forum.

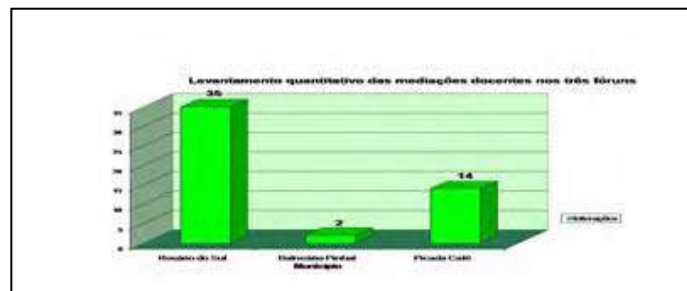
4. Data presentation, analysis and discussion

Firstly, data analysis was done separately for each relevant post. Then, we proceeded to a comparative analysis of the forums and their mediators in order to discuss the occurring interactions, as well as the influences and implications of teacher mediation in relation to these interactions. In order to try to understand how the learning occurs in online forums, quantitative surveys of messages posted by teachers and students were made, and the most relevant indicators contained in the messages posted by the forum members were also observed.

In the three forums under discussion, i.e., the ones proposed to students of distance learning centers in the municipalities of Rosário do Sul, Balneário Pinhal and Picada Café, it was the teacher who posted the initial message, in which he / she explained the rules of the forum and introduced the guiding questions. Among the mentioned rules, it has been established, for example, that students should read the texts given as theoretical support, post comments and / or significant opinions, at least twice, and these should be posted no later than the eve of the face-to-face meeting. Besides that, students were required to periodically accompany the posts of teacher and peers to keep up to date.

Through comparative analysis of forms of mediation played by each teacher, it has been possible to reflect about their possible impacts on the interactions carried out in the three selected online forums. As a starting point of the comparative analytical-route, we present, in Figure 1, a quantitative survey of teachers' mediations in the three discussion forums under discussion.

Figure 1. Quantitative data of teacher's mediations in the online forums of Rosário do Sul, Balneário Pinhal and Picada Café.



From this quantitative survey, we identify that the greatest number of teachers interventions occurred in the Rosário do Sul forum (T1's 35 posts), followed by the Picada Café forum (T1's 14 posts) and, finally, the Balneário Pinhal forum (T2's 2 posts).

In the Rosário do Sul forum, the first analyzed and the one that had T1 as the mediator, data have provided evidence of the teacher's hegemony with regard to mediation initiatives. Many were the students posts (85 of a total of 30 students), and they were consistent with the topics discussed, however, many times, the teacher intervened (35 posts), either to question some wrong positions or to agree to parts or all of what had been posted. In such cases, T1 tried to induce students to think critically, by encouraging them to reflect on the ideas and opinions posted, which often generated a student's return (15 returns).

We observed the occurrence of reflective interactions inside the Rosário do Sul forum, probably due to T1's critical interventions. Based on the messages posted, we also identified, in the mediator's speech, all the indicators of the Social Presence and Teaching Presence, according to Garrison and Anderson's Community of Inquiry Model (2003). That demonstrates the teacher's commitment in creating a favorable community to the emergence of other / new learning. Such an attitude of the mediator may have stimulated the occurrence of Cognitive Presence.

We reiterate the fact that Cognitive Presence carries, in an immanent way, the potential to trigger learning among community interacting members. According to Garrison and Anderson (2003), actions performed by the teacher must present an integrative character, as Teaching Presence brings together Cognitive and Social Presences, in a synergistic way, and with purpose of obtaining educational outcomes.

It should be noted the perception that interactive exchanges, in the Rosário do Sul forum, took place much more in the teacher-student / student-teacher relationship, probably because of the large number of teachers' interventions. Truth is also the fact that the students have demanded greater attention from the mediator, especially in terms of clarification of concepts and ideas mistakenly presented or based only on common sense.

The foregoing is supported by the considerations posted in T1's initial message.

We assume that all exchange of ideas requires that we're already in possession of an argument that is no longer the order of a mere "opinion" or a "perception". Albeit rather introductory, such an argument must accomplish an informed articulation, based on thinkers / researchers considered relevant in the area where they operate, in our case: Education, Culture, Philosophy. (Discussion Forum: Post-Modernity and the Contemporary, 2010)

In the Balneário Pinhal forum, the second analyzed, and who had T2 as the mediator, there was a low rate of teacher mediation. Actually, there were only two interventions performed by the teacher. Most of the Students sent only the two mandatory posts, trying to articulate them with the texts previously suggested as theoretical support (65 posts from a total 29 students). In some posts, there was reference to other authors that addressed themes consistent with those being treated in the forum, thereby demonstrating the student's interest in providing his / her considerations with consistent fundament. Another fact evidenced in the forum was that several students (about one third) sought to reference one or another colleague at the beginning of their remarks, usually with expressions of agreement or praise to those posts made. Another point to note is that one or another student stressed out as a possible mediator (perhaps due to poor teaching mediation).

Probably greater mediation by T2, seeking to encourage students to reflect on the ideas posted and articulate them with the theme proposed in the forum and their teaching practice, would have raised a larger number of students posts, thus, favoring meaning negotiation and collaborative exchanges within the learning community. Apparently, there was not, by the teacher, any contextualization or incitement for the development of cognitive processes in students. That is a speculation that can inspire the planning of studies to come.

In her speech, in the case of performance of larger interventions, T2 teacher could have made use of several indicators of the categories of both Social Presence and Teaching Presence in an attempt to

encourage greater student participation as well as the development of cognitive processes, seeking to generate new learning among the community members. The factors that led T2 not to make use of such indicators can also be deployed in provocative issues to be addressed and depth at another time. It should be noted that its treatment here would surpass the scope of the current study.

Regarding the participation in discussion forums, it is reiterated here the idea of Mattar (2012) that the teaching mediation must be balanced in order to avoid the monopoly of the discussions ("hindering thus the freedom of expression of students"). The opposite, however, should also be avoided, that is, the absence of the teacher's mediation ("giving the impression of abandonment students"). (p.121)

In the Picada Café forum, the last analyzed, T1 made 14 interventions, which could be considered little, comparing to the number of his interventions in the Rosário do Sul forum. However, it is assumed that maybe it was not so need for greater focus on teacher intervention in this forum. The number of students interventions was considerable (117 posts from 36 students) and their posts were very relevant and theoretically based. Around the middle of the forum, the mediator posted a comment praising the participation of all and commenting on the commitment of the students in the search for better education and also the commitment to raise issues through their posts.

In statements made in the Picada Café forum, the mediator T1, usually, after appreciating students' considerations, added any comments to the posts, containing additional information about the issue addressed and questions with the intention of instigating the group to critically think from different angles. A few times the teacher intervened to undo some mistake posted by the student. The forum was evidenced as a dialogical and interactive space for the majority of its members. Perhaps due to the fact they were also teachers, several students stood out as potential mediators. Although not the focus of research, it was observed in the Picada Café forum, the presence of several indicators of both Social and Teaching Presences in some students speeches expressed in the posts.

According to Garrison and Anderson (2003), in a Community of Inquiry – scenario about which our discussions take place, all participants should have the opportunity to contribute to Teaching Presence, as for the authors: "if the ultimate goal is to learn to learn, students must be encouraged to become self-directed, and to manage and monitor their own learning appropriate to the task and their ability."(p.71). In this sense, the authors chose to refer to such a concept not as "teacher presence" but rather as Teaching Presence.

5. Conclusions

In general, it can be seen that mediations have been conducted primarily by the teacher, consisting of positive feedback (praise regarding student participation) as well as expressions encouraging debate. From such interventions, we noticed some increase in student participation through postings of effective teacher-student / student-student dialogical interactions. It could be observed, therefore, significant indicators of Social Presence, also reiterated by collaborative movement indicators, or, in other words, actions that point to collaborative construction of learning and knowledge, in a Vygotskian perspective.

Although this study has no prescriptive intention, nor has been concerned with establishing generalizations of any kind, it seems reasonable to think of proposing procedures that may point to other / new possibilities and configurations, outlining open routes and potent findings, contributing, as a result, to a research continuum that does not end in itself.

More than that, it should be open up a path for other configurations regarding the learning in environments mediated by technology, that is, new compositions which might break the traditional professorial monologue by giving space to multiple voices so that collective-collaborative construction of knowledge could be effective.

References

- Garrison, D. R.; Anderson, T. *E-learning in the 21st Century. A Framework for Research and Practice*. New York: Routledge Falmer, 2003.
- Garrison, D. R.; Anderson, T. & Archer, W. Critical Inquiry in a Text-based Environment: Computer conferencing in Higher Education. *The Internet and Higher Education*, 2(2-3): 87-105, 2010.
- Mattar, João. *Tutoria e Interação em Educação a Distância*. São Paulo: Cengage Learning, 2012.
- Masetto, M. T. Mediação pedagógica e o uso da tecnologia. In: Moran, J. M.; Masetto M. T.; Behrens, M. *A. Novas tecnologias e mediação pedagógica*. São Paulo: Papirus, 2000. p. 133-173.
- Vygotsky, L.S. *A formação social da mente: o desenvolvimento dos processos psicológicos superiores*. São Paulo: Martins Fontes, 1934/2007.

THE DIFFUSION OF SOCIAL NETWORKING SITE IN STUDENTS' LEARNING EXPERIENCE AS A NOVEL PEDAGOGIC TOOL

Su Iong Kio

Faculty of Psychology and Education, University of Saint Joseph, Macau (China)

Abstract

With their widespread popularity, Social Networking Sites (SNSs) have been playing critical roles in social movements and political campaigns. The sheer power embedded in the interaction within SNSs has brought unprecedented amount of communication between their members and the mass population. The same power has been pursued actively in the field of education, in hope that this communication channel can be better utilized to uplift the teaching-learning practices. This paper presents the result of an experiment using Facebook as a supplementary tool in students' learning experience in addition to the tradition face-to-face in-class learning. During the experiment, students are encouraged to use the social networking site to engage each other in terms of information, opinion, discussion and collaboration. At the end of the experiment, students express their evaluation of various aspects of this learning experience such as collaboration, trust, feedback and teacher relationship. Different elements of important academic advantages of SNS are identified to help teachers better utilize this modern tool to enhance students' studies. Reported advantages come in the form of better relationship with the teacher; smoother collaboration between the students and an increase sense of trust among the students.

Keywords: *Social Networking Site, SNS, teaching technology, new learning, student-centered.*

1. Introduction

Ever since the late 1990s, when social networking site (SNS) first took its form and started developing, the social impact around its development has always drawn considerable attention from the society. They offer easy access, simple interface, powerful connectivity and integrated multimedia functionalities (Dunne, Lawlor & Rowley, 2010). They also have the most penetration into the mass population especially among young people (Pew Research, 2012). As a result of its popularity, SNS is also being pursued extensively in the education perspective. Schools and colleges have, to some extent, utilize SNS to complement the regular classroom teaching, either as discussion forum for class-related issues or as a document delivery center to give out and to collect homework and assignment. Due to the open and unrestricted nature of SNS, the discussions and conversations on those SNS platforms are mostly frank and right to the point. The feedback generated from those dialogs offer true values and, if taken serious, can improve greatly the teaching-learning environment.

2. Method and design

This research selects a class of students in a high school to participate in an SNS setting using the most popular site Facebook. A forum type discussion group was setup on Facebook to allow students from that class to initiate conversation, express opinion, request information and provide assistance to other classmates. The teacher of the class setup the group on Facebook and moderated the group. The group was only open to students from that particular class and any discussion within the group should only involve class-related issues. The group was separate from students' personal Facebook account. The teacher would start some of the conversation usually and students can weigh in. Later on, when the students got used to the environment, they would interact with each other without the initiation from the teacher.

The group on Facebook was run for a full academic year. At the end of the year, a survey was given to the students to elicit their opinion on the experience gained from the group and to evaluate their endorsement to this new tool to help their learning. The survey is divided into six sections regarding academic advantages from using the SNS. Multiple items are included in each section on a Likert scale of 5. Each item contains a statement to which students would rate their agreement, with 1 being the least

agreeable and 5 being the most agreeable. The sample size of the class is 40. Since the sample size of this experiment is not large, thus, making it difficult for more powerful analysis such as factor or regression. As a result, only descriptive statistics are reported for these items. The mean gives an idea of whether students give a favorable agreement to the statement or not. The standard deviation (std. dev.) gives an idea on the spread of the distribution.

3. Data Analysis

The six section surveyed in the questionnaire are Engagement, Teacher, Perception, Trust, Collaboration and Sense of Classroom Community. The survey questions are mostly derived from existing literatures but slightly modified to fit the context of SNS utilization for this experiment. On the scale of 1 to 5, a mean of 3 or above would imply a general agreement to the question and a mean of less than 3 would imply a general disagreement. The Cronbach alpha value for each section is all above 0.7 indicating internal data consistency.

3.1. Engagement

Engagement is the “amount of physical and psychological energy that the student devotes to the academic experience” (Astin, 1984). The section on engagement from this questionnaire consists of 6 items that link to the above definition. Table 1 shows the items together with the results.

Table 1. Survey items on Engagement

On Facebook Group,	mean	std. dev.
1. I ask questions and contribute to class discussion.	3.38	1.33
2. I participate in group projects.	3.35	1.53
3. I discuss assignments with classmates.	3.23	1.25
4. I work with the others on activities other than coursework.	3.65	1.25
5. I discuss ideas from my readings.	2.48	1.28
6. I have discussion with classmates that are usually not very close to me.	3.00	1.63

The overall performance of most of the engagement items is quite high, except for item 5 on reading. The first 3 items for engagement on academic effort are adequate evidence for the benefits of the Facebook group. The 4th item on coordination of extracurricular activities is even more encouraging, giving acknowledgement that social networking site can be effectively utilized for both educational and out-of-school practices for both students and teachers.

3.2. The Teacher

The role of the teacher on running the Facebook group is most critical as he/she is both the administrator and the facilitator of the group. The teacher’s responsibility is multi-faceted as all other leaders in online teaching environments (Berge 1995). This is not always easy to achieve and necessary training as in teachers’ professional development needs to be address on this skill. The items on the teachers and their results are shown in Table 2.

Table 2. Survey items on the Teacher

	mean	std. dev.
1. The teacher helped me on technical issues of using Facebook group.	2.60	1.34
2. The teacher helped me on knowledge issues relating to homework.	2.98	1.29
3. The teacher helped me on knowledge issues relating to lecture material.	3.18	1.45
4. The teacher and I discuss about logistic issues relating to activities, events and competitions.	4.13	1.18
5. The teacher and I talk about my personal issues.	2.40	1.08
6. The teacher and I talk about his/her personal issues.	2.35	1.10
7. The teacher has posted sufficient messages of his/her personal experience.	3.25	1.32
8. I feel I was able to know the teacher better by participating in the Facebook group.	3.38	1.25
9. I will continue to interact with the teacher even after I finish his/her class.	3.33	1.44

The overall experience with the teacher on the Facebook group seems to be mainly on school related issues. Although the teacher attempts to engage the students with some amount of self-disclosure, they are still holding back on personal and private concerns. Nevertheless, the social presence of the teacher in the group is still valued by the students, as they appreciate the improved student-teacher relationship and an enhanced willingness to maintain future communication with the teacher.

3.3. Perception of the Facebook Group

The way students perceive the usefulness and effectiveness of the Facebook group is essential to its continual application and widespread adoption as a popular tool to complement traditional school teaching. Hurt et al. (2012) suggest from their study on perception of Facebook that students already perceive social networking site as an effective means for academic discussion. They prefer it over traditional eLearning tools which require some degree of learning curve. The perception items for this experiment are listed in Table 3.

Table 3. Survey items on the perception of the Facebook group

	mean	std. dev.
1. The Facebook group makes the class more interesting.	3.43	1.45
2. I enjoy the experience gained from the Facebook group.	3.23	1.48
3. The activities on the Facebook group are relevant to real-life tasks.	2.93	1.46
4. I would prefer other classes to use Facebook groups also.	3.28	1.41
5. The Facebook group was well integrated into the class.	3.18	1.28
6. Facebook group makes discussion very convenient.	3.48	1.63
7. Facebook group is more effective than other traditional communication tool.	3.20	1.47

The perception of the Facebook group from the students is positive and reassuring. They generally fulfill the criteria of convenience, connectivity and contribution. The students are in agreement that the Facebook group should be expanded to other classes to complement regular teaching in class and making the learning experience more enjoyable.

3.4. Trust

The Facebook group is a setting that encourages interaction between the students and interaction fosters relationship. Along with the development of that relationship is a level of trust that grows as the relationship between the students deepens. Studies show that trust promotes cohesiveness, identification and intra-community collaboration (Gambetta, 1998), as well as interpersonal harmony and cooperation. Table 4 shows 5 items that assess the trust developed from the Facebook group between the students.

Table 4. Survey items on Trust

	mean	std. dev.
1. When I ask for help, other classmates are able to help me.	3.25	1.51
2. When classmates encounter problems, I feel free to discuss and listen.	3.15	1.44
3. I can share my thoughts and feelings with my classmates.	3.50	1.09
4. I have established a trusting relationship with my classmates.	3.40	1.48
5. It is an effective way for me to obtain meaningful information.	3.23	1.29

The items on this trust section all receive favorable scores, which indicate that the Facebook group does foster certain level of trust between the students. The elements of trust building, sharing and exchanging all exist in the group. Over a long period of interaction with each other, it is logical that students come to trust each other to a certain degree. They have to trust their classmates when they provide help for them and supply information to them. They also have to trust their classmates when they tell them how they feel about something and hope to get recognition in return. The Facebook group is just the right place to host this kind of interaction and develop the trust students need in each other.

3.5. Collaboration

As social networking sites are bringing people together in conversations on a common platform, their intrinsic advantage in forging collaboration among their users needs to be explored. Students are

able to interact with each other on projects and assignments without limitation of time and space. This interaction creates an environment that facilitates different levels of collaboration between students in order to obtain diverse types of knowledge and cognitive skills (Lin et al., 2013). Table 5 shows the items and results of the collaboration section.

Table 5. Survey items on Collaboration

	mean	std. dev.
1. The interaction on Facebook group helps me to know more about my classmates	3.23	1.29
2. The Facebook group allows more interaction with classmates than traditional ways of communication.	3.18	1.34
3. The interaction on Facebook group improves the quality of homework and assignment.	3.48	1.26
4. Collaboration on Facebook group is critical for group projects.	3.48	1.38
5. I feel I can learn more effectively through collaboration with others.	3.20	1.32

The general feeling on collaboration is still mainly for assignments and projects. Through multiple information sources and extensive interaction on the Facebook group, students improve a lot on the quality of homework as they confirm validity of their answers or improve appearances of their presentations. To enhance overall learning outcome through collaboration, the teacher has to provide more guidance and elicitation to bring out the activeness from the students on collective learning.

3.6. Sense of Classroom Community

Classroom community is a sense of emotional connectedness between the students in a class that provides support to each other to not only complete successfully a class or a program, but also to learn more (Rovai, 2002). This emotional connectedness is manifested through knowledge sharing and interest discussion with classmates both in school and elsewhere. Items in Table 6 evaluate the impact of the Facebook group on classroom community.

Table 6. Survey items on Sense of Classroom Community

	mean	std. dev.
1. Facebook group allows me to share my personal interests.	2.80	1.38
2. Facebook group allows me to find and share educational resources	3.18	1.30
3. Facebook group promotes knowledge sharing.	3.30	1.45
4. Facebook group makes it easy to initiate discussion.	3.43	1.22
5. Facebook group encourages learner-centered activities.	3.00	1.54

The sense of classroom community is mostly displayed in the discussion and interaction processes on the Facebook group. Students give favorable agreement to the ease of discussion on the Facebook group which is a logical outcome given the social nature of Facebook. The students also feel that knowledge sharing is at a reasonable level and it adds to the sense of classroom community by a culture of sharing with each other. The only less favorable answer is in question 1 which refers to sharing personal interest. Since the group only encourages class-related issues, students are mostly deferring personal interest to their personal member accounts on Facebook.

4. Discussion

The experiment on the Facebook group is a valuable experience for both the students and the teacher. It elevates the participation of the students in the discussion of academic related issues. It brings the students closer to each other through a sense of classroom community and also closer to the teacher as the interaction with the teacher on the Facebook group has increased significantly. It enhances the trust between the students through their collaboration on assignments and projects.

Students generally have a good perception of the Facebook group which they feel is academically beneficial to them. Engagement and sense of classroom community are both above average and should get more attention for future administration. The relatively low score is the role of the teacher. That is due to the fact that the items in the section on the teacher have a lot on personal issues and this is an area that needs to exercise caution anyway since it requires great skills from the teacher to venture into

personal issues with students. Through these data, a relatively comprehensive understanding of the operation of the Facebook group has been achieved and could be employed in subsequent application of any social networking sites to complement regular academic learning at an extended scale by any schools.

5. Conclusion

This research incorporates the fast-growing trend of social networking into the classroom teaching and learning environment. The results of the experiment should serve as a starting point for schools and teachers to evaluate the advantages and disadvantages of utilizing social networking sites for academic purposes. With the ever expanding popularity and penetration of social networking sites, it would not be a question of ‘if’, but a question of ‘when’, schools start to realize the importance of this platform in enhancing the regular teaching-learning mechanisms in today’s schools.

References

- Astin, A. (1984). Student involvement: a developmental theory for higher education. *Journal of College Student Personnel*, 25(4), 297–308.
- Berge, Z. (1995). Facilitating computer conferencing: Recommendations from the field, *Educational Technology*, 35, 22–30.
- Dunne, A., Lawlor, A. and Rowley, J. (2010), “Young people’s use of online social networking sites: a uses and gratifications perspective”, *Journal of Research in Interactive Marketing*, 4(1), 46-58.
- Gambetta, D. (1988). Can we trust? In D. Gambetta (Ed.), *Trust: Making and breaking cooperative relations*, Oxford: Basil Blackwell.
- Hurt, N., Moss, G., Bradley, C., Larson, L., Lovelace, M., Prevost, L., Riley, N., Domizi, D., & Camus, M. (2012). The Facebook Effect: College Students’ Perceptions of Online Discussions in the Age of Social Networking. *International Journal for the Scholarship of Teaching and Learning*, 6(2), 1-24.
- Lin, P., Hou, H., Wang, S. & Chang, K. (2013). Analyzing knowledge dimensions and cognitive process of a project-based online discussion instructional activity using Facebook in an adult and continuing education course. *Computers & Education*, 60, 110-121.
- Pew Research, (2012). *Social Networking Popular Across Globe*. Retrieved 31st May, 2014 from <http://www.pewglobal.org/2012/12/12/social-networking-popular-across-globe>.
- Rovai, A. (2002). Sense of community, perceived cognitive learning, and persistence in asynchronous learning networks. *Internet and Higher Education*, 5, 319-332.

DEVELOPMENT AND EVALUATION OF AN INNOVATIVE ARDUINO-BASED DATALOGGING SYSTEM FOR ENHANCING FIELD-BASED LEARNING

Yau Yuen Yeung, Frank C.C. Cheang & Lincoln Fok

Department of Science and Environmental Studies, Hong Kong Institute of Education (China)

Abstract

Technology-enhanced learning is particularly important in science education as it is featured with the unique use of datalogging systems for developing students' science process skills. However, existing commercial datalogging systems are not only quite expensive but are also installed with their own proprietary software that restricts the teachers' and students' full or creative utilization of the systems. Therefore, the primary aim of this design-based research is to design a new, low-cost and pedagogy-embedded mobile logger. This new datalogger is based on the Arduino open-source microcontroller platform and bundled with various sensors for conducting scientific investigation and field-trip activities. Besides, our new logger is fully integrated with common mobile devices through a new user-friendly Android app, called SESLogger as specifically developed for collecting, recording and sharing of data between users located in distant places.

By eliminating the large display panel and related data processing capability in the logger itself, the cost of production, CPU requirements and power consumption have been substantially reduced. Little training is required for the logger as the user will mainly use his/her smart phone or tablet for the necessary operations. Hence, it is cheaper than those market-leading dataloggers by 4-5 times, probably promoting its widespread usage in schools. Furthermore, the logger's open-source platform can renovate the practice in science education by allowing pupils to design and conduct experiments and projects by themselves.

Based on this logger and the SESLogger app, two innovative sets of field trip activities, namely (a) search of suitable sites for generating solar renewable energy and (b) investigation of heat island effect in residential areas and in a wetland park, have been developed with appropriate pedagogies by relevant teacher educators. Collaborative learning was required in the field trip and was enabled by convenient and instantaneous sharing of collected data among students located in different locations via the mobile devices. A set of research tools, including questionnaire survey, open-ended questions, interview and teacher's reflection, have been developed to assess the learning effectiveness and implementation difficulties for running the field trips in two different courses. The preliminary findings show that student participants, in general, rate the technology-enhanced learning highly. Students' feedback and comments from interview were triangulated with the reflection from the course lecturers.

Keywords: *Field-based learning, mobile learning, Arduino platform, science education.*

1. Introduction

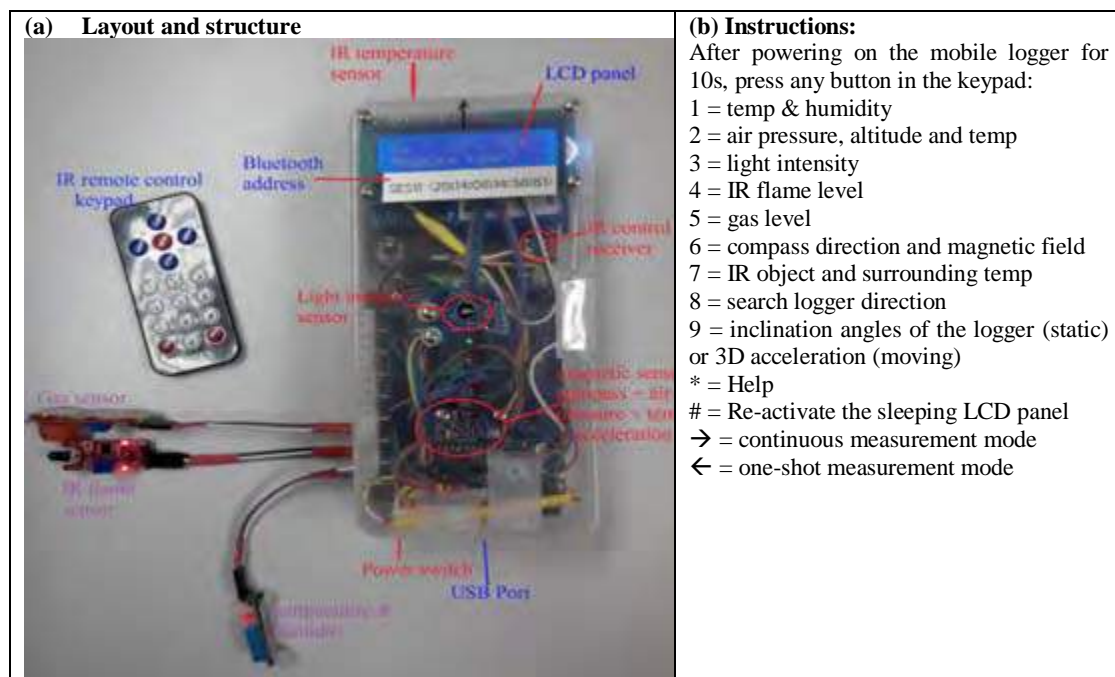
Laboratory practices/experiments and demonstrations are well-known to be an indispensable part of science education because they can help students develop better cognitive understanding of science concepts by linking theories to actual practices, develop students' hands-on instrumental skills and stimulate their interest and motivation of learning (Hodson, 1996; Abrahams & Reiss, 2012). Since two decades ago, datalogging systems, which consist of a datalogger and several sensors for measuring and logging different physical quantities, have been gradually introduced into universities, secondary schools and then primary schools for helping teachers and students to carry out different types of demonstrations, experiments and student projects (Barton, 2004). Application of datalogging systems in education represents a forefront of IT in education policies implemented by the local and many overseas governments. The so-called technology-enhanced learning is particularly important in science education as it is featured with unique use of datalogging systems for conventional or for special measurements at a high sampling rate (which cannot be done manually) or over a prolonged duration (a day or more) and for plotting the data in graphical forms for immediate analysis. However, those existing commercial datalogging systems (e.g. PASCO Scientific, 1996) are not only quite expensive (around €400 or above

for the datalogger itself and software license of around €100 each or €400 for a site license plus up to a few hundred euros for a specific sensor) but are also installed with their own proprietary software that restricts the teachers' and students' full or creative utilization of the systems. Therefore, we have initiated a design-based research (Feng & Hannafin, 2005) project to develop an innovative mobile datalogger for learning science and environmental studies within and outside the classroom environment and applied it in two undergraduate courses for conducting field-based learning (Scanlon, Jones & Waycott, 2005; Eshach, 2007). Two new Android-based apps have been specifically developed for those field trips. Evaluation has also been carried out and the findings will be discussed in the subsequent sections.

2. Design of the new system

In essence, we followed the well-known Design-Based Research (DBR) framework (Anderson & Shattuck, 2012) for the present development of the mobile logger system because DBR is "a systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings" (Feng and Hannafin, 2005). When DBR is applied in education, it is particularly useful for exploring the possibilities of novel learning and teaching environments. In our present case, development and deployment of the innovative mobile logger can help to link research and development with educational practice (Design-Based Research Collective, 2003). In order to carry out the four key steps of DBR, to wit design, enactment, analysis, and redesign, we iterated two cycles of the DBR processes by implementation of the new technology in two different courses in addition to many rounds of pilot testing, trials, debugging and refinement.


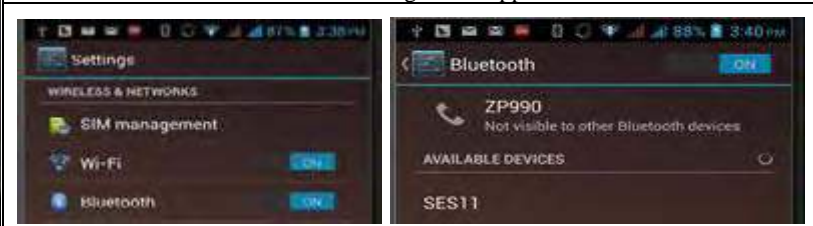
Figure 1. (a) The layout and structure newly developed mobile logger (without the key pad on the lower part of the plastic case) and (b) its instructions for using different sensors to take one-shot or continuous measurement



For the development of the low-cost mobile logger, we adopted the Arduino open-source microcontroller platform (see <http://arduino.cc/>) by using the Arduino Mega 2560 board plus a sensor shield for connecting to a number of built-in or external sensors (including temperature, humidity, air pressure, light intensity, IR temperature, magnetic field, acceleration, various types of gas and flame sensors etc.). While the board has an USB port for providing 5V power supply and uploading program, the inclusion of a 9V rechargeable battery facilitates field-based learning activities. All the hardware components and internal sensors are enclosed in a transparent plastic case of dimensions: 18 cm x 9 cm x 5 cm with a total weight of 290 grams. Its total cost is only around €20. There are eight ports for connecting to different external sensors. Because of the open-source nature of the Arduino platform, driver libraries for sensors are freely available in the public domain and they have been modified and adapted by the first author to develop the logger's operating system for controlling the hardware. The logger can receive commands from a key pad mounted on top of the case, remotely from control devices such as IR control pad and Android-based smart phones and tablets, as well as from a computer or tablet

via its USB port. The layout and essential structure of our new mobile logger is depicted in Figure 1 together with a list of commands for using different sensors to take measurement of various physical quantities. The output is directly shown on its built-in LCD display or via Bluetooth to a nearby smart phone or tablet using a new Android-based app, called SESLogger, developed by the first author specifically for the mobile logger (see Figure 2). The most important feature of the app is that it enables instantaneous sharing of the collected data via email, WhatsApp or Google Drive. This allows collaborative learning among students located in different sites during a field trip. The driver library for each type of sensor has been tested to work properly under different situations before it was incorporated into the datalogging program. The entire mobile logger system and its related apps have been tested, debugged and refined/redesigned for many times over several weeks prior to the actual field trip activities. Eight sets of the system have been constructed and demonstrated to several external parties including professionals in the technology field during a training professional development workshop to collect feedback on its applications.

Figure 2. A screen dump of the Android-based app called SES Logger and its setup procedures for connecting to the mobile logger via Bluetooth

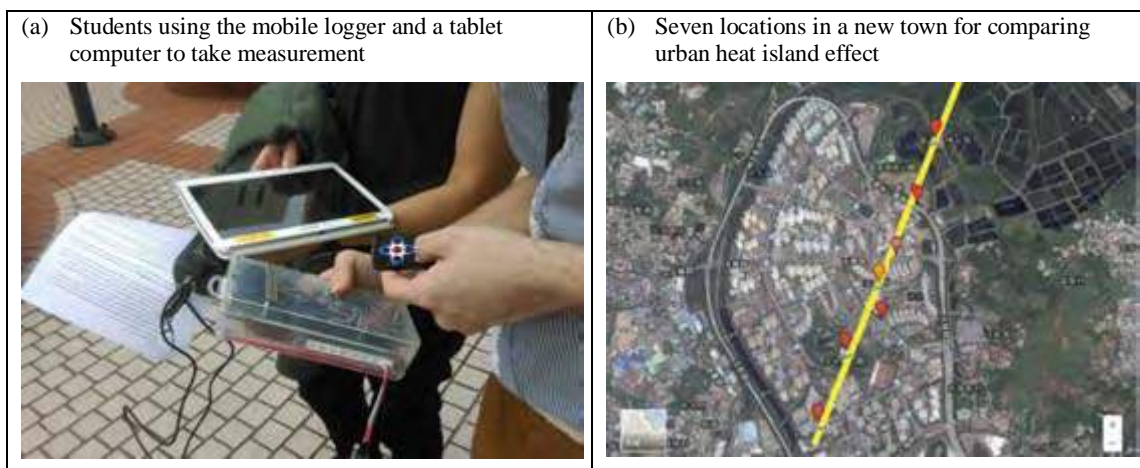
	<p>Procedures:</p> <ol style="list-style-type: none"> 1. In the Settings of an Android device, power on its Bluetooth 2. Pair the Bluetooth with your mobile logger (note its address) and input the password: 1234 3. Launch the App called SESLogger3a. 4. Click the “Connect Logger” button and select the right Bluetooth of your logger. 5. Press any button in the IR keypad to send sensor readings to your Android device. 6. If it is in the Continuous mode (i.e. → key already pressed), you need to press the OK button to send the current reading to the App.
	

3. Implementation in field trips

The abovementioned mobile logger was employed in the 3-hour field trip of two different undergraduate courses called A and B in environmental studies (Figure 3). The field trip activity for course A aims to find the most suitable sites for installation of solar panel in a university campus. A total of 22 students participated in course A and they were divided into eight groups, each having a mobile logger connected with a temperature and humidity sensor, a light intensity sensor, an acceleration sensor and an IR temperature sensor plus a tablet computer and a wind speed meter. For course B, the learning objective was to study the urban heat island effect by getting the surface temperature profile in a new town called Tin Shui Wai district, which is located in the north-west part of Hong Kong. The class consisted of 26 students who were divided into seven groups; each having a new mobile logger connected with the abovementioned sensors (without the accelerometer). Location information (including latitude and longitude) was given in another specifically-developed Android app called UHI which used the GPS sensor of the tablet to direct the students to the exact measuring sites. Because those sites were several kilometres apart from each another, synchronous measurements of temperature data were made possible by the mobile logger so that students could share and analyze data via the tablet computer.

After each field trip activity, evaluation of the learning effectiveness and implementation problems were also carried out using a self-developed questionnaire instrument, interview, class observation with video recording and photo-taking as well as lecturers' reflection. Apart from the personal particulars, the questionnaire instrument is composed of four parts, namely (1) ten items on respondents' prior learning experience with mobile devices, (2) seven items on respondents' attitudes and views on mobile learning, (3) seven items on the evaluation of respondents' e-learning experience in the field trip, and (4) four open-ended questions to collect respondents' opinions and feedback on the problems of using mobile devices for e-learning, reasons for their most interesting activities, ways for improvement and other comments.

Figure 3. Students using the new mobile logger and related app in a tablet computer to conduct field-based learning in (a) the university campus for course A and (b) a new town for course B.



4. Findings

From the questionnaire survey of two classes of students in the two field trips, 48 questionnaires were collected with a 100% return rate. For this paper, we focus on findings from the respondents' evaluation of their learning experience in each of the two field trips as reported in Table 1 in which the Cronbach's reliability $\alpha = 0.94$ and the seven items were rated by the 5-point Likert scale (with 1=strongly disagree, 2=agree, 3=neutral, 4=agree and 5=strongly agree). The mean score of every item and its standard deviation (SD) were given in Table 1 while the qualitative data collected from the open-ended questions and interview were summarized in Table 2.

Table 1. Combined results of the respondents' evaluation of their learning experience in the field trip

Item	Statement	Mean (SD)
1.	The e-learning activities as based on mobile devices are interesting and stimulating to me.	3.79(0.68)
2.	I can carry out the e-learning activities as expected.	3.75(0.73)
3.	The e-learning approach can induce my learning of the course content more effectively than the traditional one.	3.81(0.70)
4.	I like or enjoy the e-learning activities.	3.75(0.91)
5.	The e-learning approach can enhance my motivation in learning the course.	3.77(0.75)
6.	I prefer to have more e-learning activities in other courses.	3.58(0.92)
7.	I will apply similar e-learning approach in my future teaching in schools, if appropriate.	3.71(0.65)

Table 2. Consolidated results of the open-ended questions in the survey and students' comments in the interview

Question Aspect	Opinions or feedback	
Advantages	<ul style="list-style-type: none"> An interesting new trial Making e-learning more efficient Better than traditional approach by simply pressing a few buttons More interactive and the app could check the student's progress and correct their misconception 	<ul style="list-style-type: none"> Different from conventional lessons by providing hands-on activities Doing is better than listening to lecture Learn more than textbook knowledge Interesting because of locating in outdoor environment New approach with data recorded by a tablet
Reasons for most interesting activities	<ul style="list-style-type: none"> Know how to collect data by using different sensors The mobile logger is reliable and can provide the results instantaneously 	<ul style="list-style-type: none"> Students could collaborate to visit different places Can share results with students and lecturer Buttons to press in the logger
Problems on e-learning	<ul style="list-style-type: none"> Not easy to learn how to take measurement A wire was loose or the logger was malfunctioning Not so familiar with the new equipment, used it with some difficulty 	<ul style="list-style-type: none"> Difficult to read data in the app and the logger was out of order Route from Google map disappeared Tablet cannot show data from logger at the beginning Machines are troublesome
Improvement or solution to problems	<ul style="list-style-type: none"> Need a map to show the direction Improve communication methods by providing instantaneous phone call 	<ul style="list-style-type: none"> Need more user-friendly and simpler interface with better quality

5. Discussion and Conclusions

Apart from a high reliability $\alpha > 0.9$, the seven items in Table 1 are in fact highly correlated and an exploratory factor analysis revealed that all of them fell into a single dimension. Apparently, the findings indicated that the two field trips were quite successful as evaluated by the students concerned. However, a valid conclusion could only be drawn after the students having been exposed to the new pedagogy for an extended period, as changes in education are often slow processes. The issues and problems identified in Table 2 are in fact congruent with the reflection and observation provided by the relevant course lecturers as follows:

- Some groups have not successfully shared the data.
- Some minor hardware functions, suggesting for the change of remote controller, or setup some precautionary measure.
- Not able to look for GPS in the apps.
- Time is not enough at the later part of the lesson for a group discussion
- A definite advantage of the mobile logger is its ability to save calibration. The temperature and IR temperature sensor after calibration is very accurate which allow valid between-equipment comparison.
- As each group of students gets their chance to collect data, it positively promoted students' interest to the activity.
- The mobile logger is fully customizable and the locational and map function is able to guide students, some of which has minimal map reading skills, to independently arrive at various sampling locations.
- One group is unable to arrive at the exact sampling point due to inaccurate pathings generated by google map.

Those findings and comments were taken into due consideration for the subsequent refinement, redesign and improvement of the mobile logger and the apps in accordance with the DBR framework. For example, a key pad for direct input was added on top of the logger's case and the app was re-designed to have simpler setup procedures, to use GPS to show location and more user-friendly interface after its application in the first course. A help menu was also added in both the mobile logger and the apps.

Acknowledgement

Financial support from the Hong Kong Institute of Education is gratefully acknowledged. Thanks are also due to the research assistants, student helpers and students concerned for their help and participation in this project.

References

- Abrahams, I., & Reiss, M. J. (2012). Practical work: Its effectiveness in primary and secondary schools in England. *Journal of Research in Science Teaching*, 49(8), 1035-1055.
- Anderson, T., & Shattuck, J. (2012). Design-based research: A decade of progress in education research? *Educational Researcher*, 41(1), 16-25.
- Barton, R. (2004). *Teaching secondary science with ICT*. UK: Open University Press.
- Design-Based Research Collective (2003). Design-based research: An emerging paradigm for educational inquiry. *Educational Researcher*, 32(1), 5-8.
- Eshach, H. (2007). Bridging in-school and out-of-school learning: Formal, non-formal, and informal education. *Journal of Science Education and Technology*, 16(2), 171-190.
- Feng, W., & Hannafin, M. J. (2005). Design-based research and technology-enhanced learning environments. *Educational Technology Research & Development*, 53(4), 5-23.
- Hodson, D. (1996). Laboratory work as scientific method: Three decades of confusion and distortion. *Journal of Curriculum Studies*, 28(2), 115-135.
- PASCO Scientific (1996). <http://www.pasco.com/home.cfm>. Accessed 01 December 2012.
- Scanlon, E., Jones, A., & Waycott, J. (2005). Mobile technologies: prospects for their use in learning in informal science settings. *Journal of Interactive Media in Education*, 25. Retrieved March 16, 2015 from <http://jime.open.ac.uk/2005/25/scanlon-2005-25.pdf>

DIALOGIC READING AND BOOK CLUBS. THEORETICAL FRAMEWORK

Carmen Álvarez-Álvarez

Department of Education, University of Cantabria (Spain)

Abstract

In this paper, we show the results of doing a theoretical framework about three practices of dialogic reading (book clubs, literary gatherings and study circles), especially about book clubs.

The most innovative reading practices currently rely on the paradigm of dialogic reading. From this perspective, reading is the inter-subjective process of appropriating a text and delving into interpretations of it. Book clubs, literary gatherings and study circles are emerging in different social spaces to promote reading and literary discussion amongst adults, and libraries, bookshops, cultural centres, etc. are increasingly developing strategies in this direction. These three practices use different concepts of reading and dialogue, but show notable similarities. These practices generate a very favourable context for literary analysis, as they foster reading innovation and the cultivation of literature, as well as promoting values education and adult learning from a dialogic perspective. Despite the vast development of reading clubs throughout Spain, research on this phenomenon is still at the embryonic stage.

International research on these initiatives is plentiful, but in the Spanish context, there are notable differences regarding their progress and study. While literature circles have not been implemented, literary gatherings and reading clubs have. However, in terms of research, only literary gatherings have been subjected to significant study.

There are book clubs in the United States, the United Kingdom, Latin America and Spain, especially in public libraries and bookshops. The works chosen can be of any kind and are proposed by participants or by a person who undertakes the role of coordinator. The genres of today's reading clubs have diversified, and specific clubs on humour, crime fiction, poetry, among others, can be found.

Numerous international studies have shown that dialogic reading and reading clubs today are innovative and significant practices, which help to promote the enjoyment of books by people from different backgrounds, encouraging people to read who before had not developed the habit of reading.

The use of dialogic processes and discussion and substantiated opinions about the books being studied enhances individual and group reading comprehension and encourages a love of reading and books. It also frees reading from its usual contexts of solitude and intimacy, enabling the linguistic and literary growth of participants, as well as improving the language skills of the individual in the process.

Keywords: *book club, dialogic reading, literary gathering, adult education, Spain.*

1. Dialogic reading

The most recent and innovative proposals for encouraging reading are closely linked to the dialogic reading paradigm (Serrano, Mirceva and Larena, 2010). From this perspective, reading is the inter-subjective process of appropriating a text and delving into interpretations of it. This is effected by critically reflecting on the text and its context in order to enhance reading comprehension through interaction with others, thus opening possibilities for personal transformation as a reader and as an individual in the world (Freire, 1975; Valls, Soler and Flecha, 2008: 73). As stated by Mata (2009: 82): 'as opposed to solitary, intimate and silent reading... meeting spaces appear here and there, developed by readers who come together fuelled by their desire to talk about books'.

In the field of adult education there are at least three types of group practices that promote reading and discussion of literary works: book clubs, literary gatherings and study circles. Book clubs are networks generally composed of people who are consumers of literature and meet regularly to discuss a book that they have chosen to read during a previously agreed time frame (usually once a month). The works chosen can be of any kind and are proposed by participants or by a person who undertakes the role of coordinator. There are book clubs in the United States, the United Kingdom, Latin America and Spain, especially in public libraries and bookshops (Aranda and Galindo, 2009). These literary gatherings

attempt to bring the classics of world literature to all kinds of individuals and groups, including those socially excluded. To do so, the books are divided into chapters, with weekly meetings being held. This practice is gaining importance in Spain, as it succeeds in engaging very diverse people in reading as a collective endeavour and enjoying works that are often considered to be 'difficult', thus improving their self-esteem (Serrano, Mirceva and Larena, 2010). This practice is now spreading to Latin America. Literature circles are a type of study circle with the purpose of documenting, studying and reading literary works (Duncan, 2012). The study of a topic in these groups is decided by going through the literature and each participant, depending on their interests, organises their own learning process. There is a great diversity of study circles: some are aimed at the study of specific authors, historical events, relevant social problems, etc. They currently exist in the United States, Sweden and Australia, where they have had a proven impact through the dissemination and consolidation of diverse experiences (McCall, 2010).

These three practices use different concepts of reading and dialogue, but show notable similarities:

- (1) There is freedom to join or leave groups.
- (2) Diversity in age, gender, culture and education among participants is highly welcomed.
- (3) It is essential to engage in egalitarian, democratic reading and dialogue.
- (4) They can be carried out in all types of centres: schools, community centres, libraries, nursing homes, cultural associations, prisons, women's groups, etc., with slight variations depending on the type of group and age.

International research on these initiatives is plentiful, but in the Spanish context there are notable differences regarding their progress and study. While literature circles have not been implemented, literary gatherings and reading clubs have. However, in terms of research, only literary gatherings have been subjected to significant study (Valls, Soler and Flecha, 2008; Aguilar, Alonso, Padrós and Poulido, 2010; Pulido and Zepa, 2010; Serrano, Mirceva and Larena, 2010; Folecha, García and Gómez, 2013). In fact, the research production about book clubs in Spain has been more directed to their promotion than to the dissemination of scientific research, as this is virtually non-existent (Navarro and Yubero, 2004; Domingo and Sola, 2005; Calvo, 2007; Aranda and Galindo 2009; Carreño, 2012; Moral and Arbe, 2013). This is partly due to the fact that the first reading clubs began in Spain in the mid-1980s and were linked to public libraries. It is therefore necessary to study reading practices that seem to be working effectively and providing relevant results, as they are unknown to academic research despite having been in existence for about thirty-five years.

It is known that the genres of today's reading clubs have diversified, and specific clubs on humour, crime fiction, poetry, among others, can be found. Some reading clubs have also been created to study specific topics, such as the history of a country, using mostly historical novels and works on the Historical Sciences, or authors such as Shakespeare (Scheil, 2012) or Darwin (Cuvi et al., 2013). Virtual reading clubs have become increasingly popular of late, as they appeal to those who have limited time available to attend a monthly meeting (Manso-Rodríguez, 2012).

2. International studies

Numerous international studies have shown that dialogic reading and reading clubs today are innovative and significant practices (Womey, 2007; Beach and Steven, 2011; Lyons and Ray, 2014) which help to promote the enjoyment of books by people from different backgrounds, encouraging people to read who before had not developed the habit of reading (Kong and Fitch, 2003; Hall, 2009). Research by Beach and Steven (2011), which compared two book clubs, concluded that they make a positive contribution to cultivating literature, as they allow people to enjoy books in their leisure time, they can be fact- or fiction-based, and they foster a greater understanding of the works by sharing knowledge and experience and deepening the understanding of the topics raised in the books, as well as generating a personal critique of literature by each reader that allows the selection of readings adapted to fulfil the groups members' wishes.

Other researchers, such as Hall (2009), Gritter (2011), Mills (2011) and Reed and Vaughn (2012), have also ascertained that the use of dialogic processes (Freire, 1975) and discussion and substantiated opinions about the books being studied enhances individual and group reading comprehension and encourages a love of reading and books. It also frees reading from its usual contexts of solitude and intimacy, enabling the linguistic and literary growth of participants, as well as improving the language skills of the individual in the process. The study focused on young people conducted by Oszakiewski and Spelman (2011) also found that readers who discuss their books and preferences become increasingly more skilled and are able to participate in meetings to discuss books, talking about

their feelings, their opinions about the texts, as well as providing information on the nature or style of the author or the vocabulary used.

The study carried out by Womey (2007) focused on women found that the reading of, and commitment to, literature generated by dialogic reading practices elicited a new way of constructing meaning about the works that went beyond the individual and social realms. This generated a new sphere of more public and democratic literary education, and the researcher recommended that reading clubs be extended to more areas. Other studies dealing with professionals, such as the one conducted by Burbank, Kauchak and Bates (2010) on teaching faculties, have shown how a book club can be a mechanism for training and career development, both for teachers in training and for practising teachers, while also providing elements to rethink their own educational practices to make them more democratic and deliberative (Polleck, 2010; Gardiner, Cumming-Potvin and Hesterman, 2013).

Despite this, Spanish book clubs remain vastly unknown as far as research is concerned. Ethnographic studies are still to be carried out to show what kind of discussions occur within book clubs. It is known that there is a person who takes on the role of coordinator and primarily carries out the following tasks: booking the venue, selecting the books to be read—in those cases when they are not chosen by the participants—, managing the meeting agendas, organising the turn-taking during the discussion and updating the club's website—if one exists). A monthly meeting is held after a period of individual reading, and meetings usually last between one and two hours, where the aim is to discuss the work under study, with each of the group members sharing their interpretation based on their own experience. But no information exists as to how profound these debates are; what kind of personal experiences are discussed; if the behaviour of the characters in the stories are questioned and why; if the introduction, development and conclusion of the stories are analysed; if the most important passages in the eyes of readers are discussed; if the language and literary strategies employed by the author are analysed, etc. It is our understanding that the practices listed above should ideally take place, but the lack of research prevents us from confirming whether they actually exist.

References

- Aguilar, C., Alonso, M. J., Padrós, M. & Pulido, M. A. (2010). Lectura dialógica y transformación en las Comunidades de Aprendizaje. *Revista Interuniversitaria de Formación del Profesorado*, 24(1), 31-44.
- Aranda, J. & Galindo, B. (2009). *Leer y conversar. Una introducción a los clubs de lectura*. Gijón: Trea.
- Beach, R. & Steven Y. (2011). Practices of productive adult book clubs. *Journal of Adolescent & Adult Literacy*, 55(2), 121-131.
- Calvo, B. (2007). Los clubs de lectura en España. *Peonza*, 68, 21-29.
- Carreño, O. (2012). *Clubes de lectura*. Barcelona: EPI-UOC.
- Cuvi, N., Georgii, C., Guarderas, P., Arce, M. F. (2013). El camarote de Darwin: un Club de Lectura para aprender sobre la vida de Charles Darwin y su teoría de la evolución. *Revista Eureka sobre Enseñanza y Divulgación de las Ciencias*, 10(2), 242-256.
- Domingo G. & Sola, M. A. (2005). Els clubs de lectura: dues experiències a dues ciutats. Item: *Revista de biblioteconomia y documentación*, 40, 29-44.
- Duncan, S. (2012). *Reading circles, novels and adult reading development*. London: Continuum/Bloomsbury.
- Burbank, M. D., Kauchak, D. & Bates, A. J. (2010). Book clubs as professional development opportunities for preservice teacher candidates and practicing teachers: an exploratory study. *The New Educator*, 6(1), 56-73.
- Flecha, R., García, R. & Gómez, A. (2013). Transferencia de las tertulias literarias dialógicas a instituciones penitenciarias. *Revista de Educación*, 360, 140-161.
- Freire, P. (1975). *Pedagogy of the oppressed*. New York: Herder.
- Gardiner, V., Cumming-Potvin, W. & Hesterman, S. (2013). Professional learning in a scaffolded 'multiliteracies book club': Transforming primary teacher participation. *Issues in Educational Research*, 23(3), 2013 357-374.
- Gritter, K. (2011). Promoting lively literature discussion. *The Reading Teacher*, 64(6), 445-449.
- Hall, L. A. (2009). "A necessary part of good teaching": using Book Clubs to develop pre-service teachers' visions of self. *Literacy Research and Instruction*, 48(4), 298-317.
- Hammersley, M. & Atkinson, P. (2007). *Ethnography. Principles in practice*. London: Routledge.
- Kong, A. & Fitch, E. (2003). Using book club to engage culturally and linguistically diverse learners in reading, writing, and talking about books. *The Reading Teacher*, 56(4), 352-362.

- Lyons, B. & Ray, C. (2014). The Continuous Quality Improvement Book Club: Developing a Book Club to Promote Praxis. *Journal of Adult Education*, 43, 19-21.
- Manso-Rodríguez, R. (2012). "Bibliotecas: fomento de la lectura y redes sociales: convirtamos amigos en lectores". *El profesional de la información*, 21(4), 401-405.
- Mata, J. (2009). *Animación a la lectura. Hacer de la lectura una práctica feliz, trascendente y deseable*. Barcelona: Graó.
- Mills, H., & Jennings, L. (2011). Talking about talk: Reclaiming the value and power of literature circles. *The Reading Teacher*, 64(8), 590-598.
- Navarro, R. & Yubero, S. (2004). Historias de vida-Historias de ficción. Valores y creencias en torno a la violencia contra la mujer en el contexto de un club de lectura. In Yubero, S., Larrañaga, E. & Cerrillo, P. (Coord.). *Valores y lectura, estudios multidisciplinares*. Cuenca: Universidad de Castilla la Mancha.
- McCall, A. (2010). Teaching powerful social studies Ideas through literature circles. *The Social Studies*, 101, 152-159.
- Mellard, D., Patterson, M. B., Prewett, S. (2007). Reading practices among adult education participants. *Reading Research Quarterly*, 42(2), 188-213.
- Moral, A. & Arbe, U. (2013). Una experiencia docente sobre la lectura compartida, la lectura por placer y las TICS como medio de comunicación y creatividad: Club de Lectores. *Psicología educativa*, 19(2), 123-126.
- Polleck, J. N. (2010). Creating Transformational Spaces: High School Book Clubs with Inner-City Adolescent Females. *The University of North Carolina Press*, 93(2), 50-68.
- Pulido, C. & Zepa, B. (2010). La interpretación interactiva de los textos a través de las tertulias literarias dialógicas. *Revista Signos*, 2, 295-309.
- Reed, D. K. & Vaughn S. (2012). Retell as an indicator of reading comprehension. *Scientific studies of reading*, 16(3), 187-217.
- Scheil, K. W. (2012). *She Hath Been Reading: Women and Shakespeare Clubs in America*. Ithaca: Cornell University Press.
- Serrano, M.A., Mirceva, J. & Larena, R. (2010). Dialogic Imagination in Literacy Development. *Revista de Psicodidáctica*, 15(2), 191-205.
- Stake, R. E. (2005). *The art of case study research*. London: Sage.
- Oszakiewski, H. & Spelman, M. (2011). The Reading/Writing Workshop: An Approach to Improving Literacy Achievement and Independent Literacy Habits, Illinois. *Reading Council Journal*, 39(2), 13-26.
- Valls, R., Soler, M. & Flecha, R. (2008). Lectura dialógica: interacciones que mejoran y aceleran la lectura. *Revista Iberoamericana de educación*, 46, 71-88.
- Womey, S. (2007). Reading "woman": Book club pedagogies and the literary imagination. *Journal of Adolescent & Adult Literacy*, 50(5), 398-407.

THE CREADA, A NEW PEDAGOGICAL CENTER FOR ADULTS INFORMAL EDUCATION

Maria Luisa De Natale¹ & Cristiana Simonetti²

¹*Dipartimento di Pedagogia, Università Cattolica Sacro Cuore, Milano (Italy)*

²*Dipartimento Medicina, Università di Foggia, (Italy)*

Abstract

Creada, (Center for educational relations among adults and adolescents) finds its roots in 2006 as an educational project promoted by Catholic University of Sacred Heart, the Association for Christian Centers for families, (Consultori cristiani), and an Association for Mirasole Abbey. (medical association). Creada is a place where all adults who are in relationship with adolescents: parents, teachers, doctors, out of school educators, could apply to discuss about educational problems and where they could receive educational support in their daily life. It is evident, in fact, in Italy, as everywhere, that the intergenerational dialogue among adults and adolescents is more and more difficult because the educators are not prepared to understand the way in which young people act. Creada center is characterized by its interdisciplinary experts, not only referred to human sciences, but also to medical science. This is original for Italy, because according to Creada education is *salus*, health, and the request for health is a request for education, in order to promote the whole personality of each one in his physical, psychical, cultural and relational needs, and in the hidden need to take part in a conscious way to the human life, in order to give a personal contribution to the common good. To be in a good health, in fact, means to be in equilibrium with ourselves, with our world, and with our time, and that is to say to live a dynamic equilibrium which is different for each person. The good health is a condition to live the human experience in its whole meaning. This Creada approach is referred to the anthropological ideas of Personalism, that is to say that each human being is a value who has his own dignity which is the fundament for each right and duty, because in the same duty to look for a meaning to his own being, there is the educational way of life. The educators are engaged to give life to principia of wealth. Creada is in short, a center for adults and among adults. This Creada centrum is offering counselling, research, formation. Counselling to adults, research on adolescent's behavior at national and international level, research on new methods for adult education, courses for all people interested in improving their own educational competencies. The method used is research –action, in order to involve educators to take part to the research project with Creada's researchers, so the educators could be helped with scientific instruments which are created just for their case. The idea of this method is: as long as I understand and I learn, I change myself, because the researchers study the human phenomenon in practice and then they try to act on it and to introduce in it some different way of behavior. Creada staff put itself close to educators and offers an educational support so that the educators could overpass the feeling to be alone in front of these difficult adolescents and could use scientific instruments which are created just for their case.

Keywords: *Adult education, family education, non formal education, informal education.*

1. Introduction

CREADA, (Center for educational relations among adults and adolescents) find its roots in 2006 with the aim to be a place where all adults, who are in relationship with adolescents: parents, teachers, doctors, out of school educators, could go to discuss about educational problems and where they could receive educational support for their life. It is evident, in fact, that the intergenerational dialogue among adults and adolescents is difficult because the educators are not prepared to understand the way in which young people act. Creada is characterized by interdisciplinary experts, not only referred to human sciences, but also to medical sciences because for Creada staff, education is *salus*, health, and the request for health, is a request for education, in order to promote the whole personality of each one in his physical, psychical, cultural and relational needs, and in the hidden need to take part in a conscious way to the human life in order to give a contribution to the common good. To be in a good health, means to be

in equilibrium with ourselves , with our world, and with our time , that is to say to live a dynamic equilibrium which is different for each person. The good health is a condition to live the human experience in its whole meaning. This Creada approach is referred to the anthropological ideas of Personalism, that is to say that each human being is a value who has his own dignity which is the fundament for each right and each duty, because in the same duty to look for a meaning to the personal life , there is the educational way of life. The good health is a condition to live the human experience in its whole meaning.

2. Strategies and Methods

This Creada centrum is offering counseling, research and formation. Counseling to adults, research on adolescent's problems at national and international level, research on new methods for adult education, courses for all people interested in improving their own educational competencies. The method is research-action, in order to involve educators to take part to the research project together with Creada researchers, so the educators could be helped with scientific instruments which are created just for their case. The idea of this method is: as long as I learn I change myself, because the researcher studies the human phenomenon in reality and then he tries to act on it and to introduce in it some different ways of behavior. Creada staff is close to educators and offers an educational support so that the educators could overpass the feeling to be alone in front of these difficult adolescents. Three main innovative methods Creada staff is introducing into practice: 1-Educational Competencies Bilancium; 2-Lipman's method ; 3 -Praxis educational community, and many more which are in the study. The first method is a pedagogical transposition of the well-known method originated in France and referred to vocational training. Creada staff has introduced some variations in it with some educational categories and is using it for adults who want to become conscious of their educational competencies, and to feel well in their own job, like educators of adolescents. The second one is an adaption of the method better known as method of Philosophy for children by Lipman: a Creada researcher received the authorization by Lipman staff to use it with adults and to produce some short papers in this direction, according to different situation and different groups. This method is very useful in experiences with teachers, students, and parents. A very interesting experience was done in a secondary school in Aquila, (Abruzzo) , because the dialogue between generations was increased by using this method with three different groups :students , parents of these students, and teachers of the same students :they arrived to discuss of the same values , but at the beginning they were not able to discuss of these problems, because they have difficulties to understand and listen to each others. The third method is the one referred to E. Wenger, very well known as method for improving knowledges in the work situations . The idea is that workers could learn one by the others if they feel themselves like members of a community and if they live some situations to share abilities, to solve problems in an informal way. This method is very effective with parents, when they are in a group with other parents and they feel that all have similar problems with their children. By using this method even not lettered people could find the strength to express themselves, and to enter into relations with other people, breaking the resistance they have in front of experts or very lettered people. The method of narrative investigation is often used as a method for qualitative research: all Creada researchers continue with this basic method.

3. Some experiences

The first experience was done with the National, Association of Christian Centers for families, Creada prepared an instrument to investigate if adolescents went to these centers to get some help, and if they went alone or with their parents (You can find the instrument on the website www.creadaitalia.it). We received from different Italian region more than 511 cases on which we worked. Then we invited the operators of the centers to a residential course, for some days, to discuss their educational actions and the possible ones they could use in a pedagogical perspective, not to criticize but to enlarge the common way of reacting to adolescent behaviors. In this course there were interdisciplinary experts for all subjects we have already quoted. The idea is that if an adolescent asks for help, you must and can start an educational dialogue, but often people in these centers have no educational competencies and they offer a clinical treatment which sometimes could be not necessary. A second experience, with the same centers in Lombardia, aimed to know if the approach to the centrum by adult women or couples, was at the origin of an educational help in relation to the reasons for which a marriage was destroyed. This research showed that the need of relations is very strong, as we could illustrate in a scheme during the meeting .Besides these experiences, I want to refer about an experimental project in the spirit of relational pedagogy. It is "The places of education in dialogue "and it is referred to seven municipalities in Milano. The idea was to act in order to let all people reached by an educational offer, so they could communicate sharing the same

language. The project was going on for three years and we were engaged to offer different activities – courses on the same educational subject to mixed groups: educators, parents, teachers, and then we put them all together to discuss educational problems and to decide what to do for the better future of their children and for the quality of their lives. This was an innovative project for the relational pedagogy based on the conviction that in order to communicate correctly, it is necessary to share the same language and very often, in the educational field, we have many different meanings, people do not appreciate the work of other educators, for instance family and school, and it is necessary to start with a common language, to share common ideas. The project was a laboratory for Creada team and offered some good results, because all the citizen in that environment start to discuss on educational problems and behaviours. One more interesting research, was referred to educational competencies required in the daily life of a couple because of the new problems related to the complexity of the family and to the increasing difficulties of the intergenerational dialogue. The research has been realized in a town in the north of Italy (Verona) and has its background in the UNESCO definition (1995) of informal learning and education. The main idea is that adult education, which we distinguish from learning, is an “education for life,” in the meaning in which the Danish Lutheran pastor N.F.S. Grundtvig was presenting it since XIX century. The aim of adult education is “enlightenment “and “awakening” in order to face the challenges of our lives and of our societies (De Natale, 1979) This idea of education, based on a Christian anthropology, has been confirmed in all the international conferences on adult education from the Montreal, Unesco Conference (1946) until the Hamburg Unesco Conference(1997) and it is well known as lifelong education distinguished by lifelong learning. Education must be considered like a dimension of our life, because all of us need to remain leading actors of our lives in this changing world, and it is necessary to be helped in the consciousness of the responsibility of our own free choices, and of our own unavoidable commitment. Learning is important but it is not sufficient in this knowledge society, because life is much more than our brain, and each person can proceed according to an itinerary that goes from consciousness to an informed and responsible stance in the light of the values chosen for his /her own life with a responsible freedom. Young adults who decide to build their families, as it is evident nowadays, are often unprepared to create family in the direction of a “longlife project “and not of a project “as long as it lasts”. All of us know the educational problems for children of these couples separated and reconstituted as in “mosaic “families. That is the reason for which we retain that families are an important research field in the adult pedagogy. The scientific foundations which are on the basis of the Verona project are attributable to “Transformative Learning theory” by J. Mezirow and to “Community of Practices method “ by E. Wenger .The first theory, coming from Teacher College in Columbia University in New York, allows us to understand that adults can learn only through reflection on their direct experiences that enable them to modify the personal theoretical assumption. It is necessary a process which starts with a “disorienting dilemma” on the daily life and which opens to the “reflective thinking “and then to the possibility to change the guiding principles of personal life. “Transformation is a process whereby we move over time to reformulate our structures for making meaning, usually through reconstructing dominant narratives or stories. This provides us with a more dependable way to make meaning within our lives, since we are questioning our own point of view, looking and reflecting on alternate points of view and often creating a new more reliable and meaningful way of knowing that may be different from our old habits of the mind. This requires us to become open to others points of view and to be able to reflect on new points of view and information and often go back and reconstruct what we know and how we know it” (Mezirow, 2003) Etienne Wenger, from his size, has demonstrated as adult can learn if they are together in groups with a common interest and can share experiences ,”communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly” (Wenger, 2006). What is necessary is a shared domain of interest, that is to say a common shared competence, the community, in order to build relationship which enable them to learn from each other, the practice, that is to say that this group develop a shared repertoire of resources in their practice. The combination of these three elements constitutes a community of practice. On these scientific basis we originate the idea of the project: we built a network in the town with the local Church, the Public Health Advisory, and Opera Don Calabria, a Catholic Foundation very rooted in the town. To each of these institutions, according their character, we ask to select a group with fifteen couples, distinguishing 1-couples who were going to marry, 2- couples who were in pregnancy, 3 - couples with children in the primary schools. With these three groups we start a research- action using different methods. The design of the scientific research has involved the use of various devices-such as the qualitative and quantitative methodology in order to understand the multifaceted nature of the issues under investigation. The different levels of organization and analysis of data are not independent from each other, but are united by a bond of interdependence that characterizes the overall system science research. In fact, the “quantitative research methods seek to measure attainment of clearly established, specific outcomes”. Qualitative measures, “can begin to capture more complex phenomena that are so easily quantifiable and

not so fully understood without a depth and breadth of information including information about the individual and the context of the learning”. Qualitative research methods “seek to understand process as well as product. Seek to understand learning from the perspective of those involved. In qualitative paradigm, the goal is for the instructor to understand learning from the perspective of the learner and perhaps all those involved in the learning process, recognizing that there is no one truth, seek to understand the meaning that people made of the experience. The qualitative paradigm does not seek to measure outcomes...but rather to truly understand outcomes” (De Natale,2013) The method of inquiring was research-action and the interdisciplinary group of researchers utilised modern strategies and new instruments to learn in a situated educational context the educational needs, the resources, the abilities, and the practical educational knowledge of couples. In the second phase of the research the three groups lived the experience of the educational laboratories in order to cause the emergency of the ability of empowerment of parents in the experience of the transition at key stages of life, in order to analyze the educational skills related to the ability to reflect on the needs and on the educational resources arising from their experience of life. Each target was provided with two opportunities to attend laboratories with different proposals and so the players participating in research, were stakeholders. The qualitative methodology was an effective way to activate an educational change, in making the participants able to reflect on the needs arising from their experience of life, in learning to identify the subjective educational resources. In particular in the laboratory of couples with pregnancy for their first child, the qualitative analysis had the objective:- to investigate the resources and educational skills they have already and those which had to be reached as couple and as single parent, factors of well-being of couples before marriage, and in the months referred to waiting their first child ; - to investigate the understanding of the parental role, the educational skills perceived as necessary in the months going to the parental role and in their future conduct for their educational role with the child; In the other two laboratories the objective were - to investigate the ability of pedagogical reflection on the parenting role (the interviews are designed in order to investigate the representation and the lived experience as parents and as son/daughter); - to study the links between educational skills declared before becoming father/mother and those really found in the experience of transition that goes from pregnancy to the birth of first child - -to explore the educational resources arising from the affective relationship ;In the laboratories has been used a mixed - sequential methodology. It was structured in moments of classroom and moments of individual work and couple at home. The results and the aim of the project focused some interesting pedagogical categories which must be considered in the educational competencies required in the actual complex life in the family. The heart of the research revolved around a concrete exercise of reflecting thinking. 1) how to understand the ideal of a whole education of parents as person in transitional processes in the life: marriage, parenting and family; 2) how to understand and interpret the educational scenarios desirable when couples became parents, giving space to all the possible emotions; 3) how to effectively create " the educational framework of competences attended" in order to build a new culture of family-oriented to the future of our times.

The family today is affected by the training delays that have been accumulated in the past decades and that become more pronounced, because of social, economic and cultural life crisis which in the years has affected the United States, then Europe and all the world. Several data that characterize the educational resources, have confirmed that the only quantitative analysis of indicators is not in itself useful to explain the phenomenon, but it is required a much broader view, which could enable us to collect the contributions from scientific research experience in order to explain items very significant referred to the parental educational needs., in order to create opportunities for exchanges and discussions between parents on the issues of the different educational experiences in the different stages of life of the couple and in the family. Object of analysis of this research was therefore the central role of education for the human development of the parents. The research on this type makes a real contribution on two criteria: to prevent the discomfort in the family, to promote interventions on issues of education by enhancement of educational skills of parents, the ones already in their possession, and the educational skills which must emerge in the process of parental learning that requires careful and essential pedagogical preparation. Such measures are necessary for the growth of children: the well being of future generations will depend on the ability of adults to discuss today on the education of their children. To bring out the value of education by giving space to the educational skills of parents, means taking a more organic approach to pedagogy. Each time in the family life is a new beginning and a beginning that especially concerns the moments of transition where it is most evident the transition towards generativity experiences to live in joy, in love, in hope, in good, in gratitude, in enthusiasm, with satisfaction towards everything that surrounds us.

All must become positive experiences that mark the individual, subjective and personal maturation processes that will inevitably involve the social sphere in an overall vision of life and of person, marked by the construction of a free society, conscious of itself and determined in assuming

responsibility in education. How to understand, therefore, the ideal of comprehensive training of parent process to transition to parenting, marriage and family? With regard to this point, research has highlighted the positive attitude of the couples towards a return to training either as a path of personal development or as a reflection group for the maturation of those educational skills that have been learned in the course of the experience of pregnancy and the cycle of life that rarely can be shared in different places. Each one could learn how to transform the educational experience into a new pedagogical knowledge to share with their family and with the society. The need of training, for couples and families arises from the need to consider how fundamental is the acquisition of knowledge and know-how to share: parenting education can be integrated with skills already learned in previous 'arc of family life' and with those skills that arise from comparison with partners in presence of those who live in the same phase of life transition. This research has revealed a comprehensive picture of the educational skills, has recognized the value of what fosters the forms of social exchange, whose purpose is the production of relational goods and whose means are the gift, the reciprocity and the symbolic exchange, so as it happens in small communities, in family relationships, in neighbourhood and across the generations. It's a new way to experience the culture of education, to assume the responsibility of the educational knowledge that the true human joy is in seeing children growing up, but being with them, attending to them day-to-day with a spirit of growth promotion of their abilities, of their dignity, of their freedom. All these experiences and many others are documented in published books named *Quaderni del Creada* (seven voll.) and in a publishing series named *Educazione degli adulti* under the direction of Maria Luisa De Natale.(ten voll.) which could be found in website already quoted.

4. Conclusions

It is impossible to present a conclusion for this Creada research project: our idea was to share with you the work we are doing in the spirit of relational pedagogy, because in this meeting we could exchange our experiences and we could learn reciprocally in order to improve our educational engagement at all levels.

References

- De Natale M.L.(1979), *L'educazione per la vita*, N.F.S.Grundtvig pedagogista ed educatore danese, Roma, Bulzoni-istituto danese di cultura.
- De Natale M.L.,(2013), *Bisogni educative e risorse nel ciclo di vita delle famiglie. Una ricerca nella realtà di Verona*, Bari,Ed. Insieme
- De Natale M.L. Simonetti C., (2014), *Genitori in formazione, esperienze europee a confronto*, Lecce, Pensa Multimedia
- Mezirow, J.(2003), *Apprendimento e trasformazione*, trad.it.,Milano, Cortina ed.
- Wenger E,(2006), *Comunità di pratica*, Milano, Cortina ed.

ADOLESCENTS' HEALTH LITERACY AS A BUFFER IN A CRISES CONTEXT OF A LEGIONELLA OUTBREAK IN PORTUGAL (CRADLISA PROJECT HLS-EU-PT)

**Luís Saboga-Nunes¹, Gabriela Cavalheiro², Sandrina Correia³, Anabela Santos³,
Paulo Pinheiro⁴, Ullrich Bauer⁴ & Orkan Okan⁵**

¹*National School of Public Health, New University Lisbon (Portugal)*

²*Escola Secundária de Bocage, Setúbal (Portugal)*

³*Escola Secundária (Portugal)*

⁴*University of Bielefeld (Germany)*

⁵*University of Duisburg-Essen (Germany)*

Abstract

Health literacy (HL), is considered to play a relevant role in disease prevention and health promotion. This research focus HL influence in a public health crises context of a legionella outbreak in the last quarter of 2014 in a region north of Lisbon (VFX), Portugal. With 375 affected and 12 death (one of the worst outbreaks in Europe in recent years) public health measures to counter act the influence of social stress and disease impact were activated. A quantitative and qualitative explanatory cross-correlated study based on a sample of 215 adolescents was collected in a school setting, after ethical procedures were followed. Measurement of adolescents HL (CrAdLiSa project) was implemented with the HLS-EU-PT survey, the Portuguese version of the European Health Literacy Survey instrument (www.literacia-saude.info). HL seems to play a buffer role in a crises situation.

Keywords: *Health Literacy, HLS-EU-PT, Adolescent Health, Legionella Outbreak.*

1. Introduction

Health literacy as a concept and a tool to increment a person's ability to navigate throughout his or her life course is today deeply incrustrated in discussions that focus health promotion and health care. Not only practitioners but also educators, are sensitive to this area of knowledge. Increase investment in HL is dominating research agendas. There is a connection between HL and public health interest in increasing populations wellbeing. HL has direct impact over health behaviors (Sanders et al., 2009). In line with this, educators and the education settings can play a major role in promoting HL as a direct outcome (Paakkari and Paakkari, 2012). Consequently the discussion on how to increase and promote HL is also focused on creating room to introduce HL in the curriculum, making it a school topic/subject. New perspectives are being opened (Institute of Medicine (IOM), 2004) like the question if HL, can be considered as a buffer variable at early ages (e.g. adolescence). Newly developed approaches have been used to study adults populations' HL, but the question has not been addressed on how this could be adapted and applied to earlier ages groups (like adolescents) (Manganello, 2008). The HLS-EU (Sorensen et al., 2014) project has emphasized the dimensions of health care, health prevention and health promotion covering a wide range of perspectives in an integrated approach. With the present research, for the first time to our knowledge, HL is assessed with an adapted version of the HLS-EU instrument, (the HLS-EU-PT, see annex 1) in a school setting (Saboga-Nunes, 2014). This was done in the context of a public health crises. In the last quarter of 2014 in a region north of Lisbon (VFX), Portugal, a legionella outbreak increased social stress, with 375 affected and 12 death (one of the worst outbreaks in Europe in recent years). Our research question was focused on how health literacy helped cope with the legionella outbreak in an adolescent population.

2. Objectives

The purpose of this research is to evaluate how health literacy could be an allied and a buffer to counteract social stress. It is considered a school setting from the affected area of the legionella outbreak.

3. Methods

Study population:

It was conducted a multi-region study based on data from the study CrAdLiSa "saúde e bem-estar em tempos de crise" 2015, including six regions in Portugal. This is a population study where students older than 12 years of age are invited to participate in a CAWI process of data collection. A web address is provided to all of those students who have been authorized by their parents to participate. Only these are integrated in the study and this restriction results in a total sample of 215 students from the school of Vila Franca de Xira, selected for the research, after ethical procedures were followed.

Measures:

Health Literacy (HL). Information on HL was assessed with the 47 items of the European Health Literacy Survey (HLS-EU) that has been validated to Portuguese and adapted to this population of adolescents (Annex 1). Measurement of adolescents HL (CrAdLiSa project) was implemented with the HLS-EU-PT survey, the Portuguese version of the HLS-EU Survey instrument (www.literacia-saude.info). Using the authors criteria, participants were classified into four categories of HL: 1) inadequate (< 25 score); 2) problematic (between 25 and 33); 3) sufficient (between 32 and 42); 4) excellent (>42)

Demographic characteristics:

Using reported birth dates, ages were calculated and participants were categorized into seven age groups, 12, 13, 14, 15, 16, 17, 18. The CrAdLiSa data provides variables of educational attainment: the recoded variable that focuses on levels of education.

Data analysis:

For the entire sample, for all variables, descriptive statistics were calculated (e.g. means, standard deviation and percentages). Student t-test and ANOVA were performed to assess sex, age and education level differences for the levels of HL. Bivariate relationships between HL (satisfactory HL vs. compromised HL), and sex, age and educational level were tested by chi-square test and Mann-Whitney test. To test associations between HL, and sex, age and education level a logistic regression analyses was conducted. Pearson's correlations were also computed. All statistical analysis was performed using IBM SPSS Statistics 22. The significance level was set at $p < 0.05$.

4. Results

Reliability analysis of HLS-EU-PT dimensions show an internal consistence (Cronbach's alpha coefficient) of 0.946 (Health Care), 0.947 (Disease Prevention) and 0.958 (Health Promotion), while the global instrument presents a value of 0.98. Inadequate HL (4.2%) and problematic HL (21.7%) show that about 25% of respondents have limited HL.

A Pearson product-moment correlation coefficient was computed to assess the relationship between HL and the 10 legionella outbreak perceptions. There was a positive correlation between HL and five of these items: the higher was HL, the less doubts concerning the legionella outbreak ($r = 0.299$, $n = 125$, $p = 0.01$) were expressed, the more adolescents tend to interact and communicate with their parents ($r = 0.405$, $n = 128$, $p = 0.01$), friends ($r = 0.338$, $n = 130$, $p = 0.01$), searched for information regarding it ($r = 0.265$, $n = 118$, $p = 0.01$) and have taken measures to deal with the crisis situation ($r = 0.250$, $n = 127$, $p = 0.01$)

5. Conclusions

The results enhance the reliability, validity, internal validity, statistical validity longitudinal and linguistic validity, as land marks of the translation and validation process to Portuguese of the HLS-EU survey and applied to evaluate adolescents HL. HL seems to play a buffer role in a crises situation.

HL is associated with the perception of having resources to deal with a public health crises of a legionella outbreak. Those with higher HL have better assimilated public health messages by health authorities in social media to deal with the current crises, and, deal better with precautionary measures about the outbreak.

Of the 10 items assessment instrument concerning the legionella outbreak, five had a positive statistical association with HL. Further research must investigate HL potential at this age range and how it should be developed in the school curricula.

Table 1. Sample characteristics

	N (%)
<i>Sex</i>	
Male	92 (43.40)
Female	120 (56.60)
<i>Age (%)</i>	
12	15 (7,1)
13	48 (22,6)
14	65 (30,7)
15	46 (21,7)
16	24 (11,3)
17	10 (4,7)
18	4 (1,9)
<i>Education level</i>	
7th gde	57 (26,9)
8th gde	72 (34,0)
9th gde	80 (37,7)
10th gde	1 (0,5)
12th gde	2 (0,9)
<i>Health Literacy level</i>	
inadequate	9 (4,2)
problematic	46 (21,7)
sufficient	85 (40,1)
excellent	72 (34,0)

Table 2. Estimated prevalence of HL by selected characteristics.

Sample characteristics	HL mean (min-max)
<i>Sex</i>	
Male	39.27 (17-67)
Female	38.83 (23-67)
<i>Age (%)</i>	
12	40.47 (26-67)
13	39.45 (24-67)
14	40.41 (23-67)
15	37.41 (25-59)
16	36.89 (17-67)
17	36.52 (23-49)
18	43.44 (33-50)
<i>Education level</i>	
7th gde	38.71 (23-67)
8th gde	42.02 (24-67)
9th gde	36.76 (17-67)
10th gde	31.56 (32-32)
12th gde	34.40 (32-37)

References

- Saboga-Nunes, L, Kristine Sorensen (2013). The European Health Literacy Survey (HLS-EU) and its Portuguese cultural adaptation and validation (HLS-PT): Paper presented at the World Congress of Children and Youth Health Behaviours, 1 / National Congress on Health Education, 4, 23-25 May 2013, Viseu, Portugal. *Atención Primaria*, 45, 46.
- Saboga-Nunes, L. (2014). Literacia para a saúde e a conscientização da cidadania positiva. *Revista Referência*, 11 (III Série – Suplemento) 94-99.
- Saboga-Nunes L. Compreender o cidadão e fortalecê-lo na gestão do stress. *Rev Port Saúde Pública*. 1998;16(4) 25-31.
- Paakkari, L. and Paakkari, O. (2012), “Health literacy as a learning outcome in schools”, *Health Education*, Vol. 112 No. 2, pp. 133-152.

- Sanders, L.M., Shaw, J.S., Guez, G., Baur, C. and Rudd, R. (2009), "Health literacy and child health promotion: implications for research, clinical care, and public policy", *Pediatrics*, Vol. 124 No. S3, pp. S306-S314
- Institute of Medicine (IOM) (2004), *Health Literacy: A Prescription to End Confusion*, The National Academies Press, Washington, DC.
- Kickbusch, I. (2001), "Health literacy: addressing the health and education divide", *Health Promotion International*, Vol. 16 No. 3, pp. 289-297.
- Levin-Zamir, D., Lemish, D. and Gofin, R. (2011), "Media health literacy (MHL): development and measurement of the concept among adolescents", *Health Education Research*, Vol. 26 No. 2, pp. 323-335.
- Manganello, J.A. (2008), "Health literacy and adolescents: a framework and agenda for future research", *Health Education Research*, Vol. 23 No. 5, pp. 840-847.
- Marks, R. (2012a), "Health literacy: what is it and why should we care?", in Marks, R. (Ed.), *Health Literacy and School-Based Health Education*, Emerald, Bingley, pp. 1-41.
- St Leger, L. (2001), "Schools, health literacy and public health: possibilities and challenges", *Health Promotion International*, Vol. 16 No. 2, pp. 197-205.
- Wills, J. (2009), "Health literacy: new packaging for health education or radical movement?", *International Journal of Public Health*, Vol. 54 No. 1, pp. 3-4.
- Wu, A.D., Begoray, D.L., Macdonald, M., Wharf Higgins, J., Frankish, J., Kwan, B., Fung, W. and Rootman, I. (2010), "Developing and evaluating a relevant and feasible instrument for measuring health literacy of Canadian high school students", *Health Promotion International*, Vol. 25 No. 4, pp. 444-452.
- Marks, R. (2012b), *Health Literacy and School-Based Health Education*, Emerald, Bingley.

Annex 1: HLS-EU-PT©

Portuguese version (for adolescents) of the European Health Literacy Survey instrument HLS-EU-PT© the CrAdLiSa project - incrementando nas CRIanças e ADolescentes a Literacia para a SAÚDE.

- 1 "... encontrar informações sobre sintomas de doenças que te dizem respeito ou causam preocupação? "
- 2 "... encontrar informações sobre tratamentos de doenças que te dizem respeito ou causam preocupação? "
- 3 "... descobrir o que fazer em caso de uma emergência médica? "
- 4 "... descobrir onde obter ajuda especializada quando estás doente? (por ex. junto de um médico, farmacêutico, psicólogo) "
- 5 "... compreender o que teu médico te diz? "
- 6 "... compreender a bula (os folhetos) que acompanham o teu medicamento? "
- 7 "... compreender o que fazer numa emergência médica? " 8 "... compreender instruções do teu médico ou farmacêutico sobre o modo de tomar um medicamento receitado
- 9 "... avaliar como é que a informação oriunda do teu médico se aplica ao teu caso? "
- 10 "... avaliar vantagens e desvantagens de diferentes opções de tratamento? "
- 11 "... avaliar quando podes necessitar de uma segunda opinião de outro médico? "
- 12 "... avaliar, se a informação sobre a doença nos meios de comunicação é de confiança? " (por ex. TV, Internet ou outros meios de comunicação)
- 13 "... usar informações que o teu médico te dá para tomar decisões sobre a tua doença? "
- 14 "... seguir instruções sobre medicação? "
- 15 "... chamar uma ambulância em caso de emergência? "
- 16 "... seguir as instruções do teu médico ou farmacêutico? "
- 17 "... encontrar informações para gerir comportamentos que afetam a tua saúde tais como fumar, atividade física insuficiente e beber álcool em demasia? "
- 18 "... encontrar informações para gerir problemas de saúde mental, tais como stresse ou depressão? "
- 19 "... encontrar informações sobre vacinas e exames de saúde que devias fazer? " (por ex. teste de açúcar no sangue, pressão arterial)
- 20 "... encontrar informações sobre como prevenir ou controlar condições tais como o excesso de peso, pressão arterial alta ou colesterol alto? "
- 21 "... compreender advertências relativas à saúde e comportamentos tais como fumar, atividade física insuficiente e beber álcool em demasia? "
- 22 "... entender porque precisas de vacinas? "
- 23 "... entender porque precisas de exames de saúde? (por ex. teste de açúcar no sangue, pressão sanguínea) "
- 24 "... avaliar quão seguras são as advertências envolvendo a saúde, tais como fumar, atividade física insuficiente e beber álcool em demasia? "
- 25 "... avaliar quando precisas de ir a um médico para um check-up ou exame geral de saúde? "
- 26 "... avaliar quais são as vacinas de que podes precisar? "
- 27 "... avaliar que exames de saúde precisas de fazer? (por ex. teste de açúcar no sangue, pressão sanguínea) "
- 28 "... avaliar, se as informações sobre os riscos de saúde nos média são de confiança? (por ex. TV, Internet ou outros meios de comunicação) "
- 29 "... decidir se deves fazer a vacina contra a gripe? "
- 30 "... decidir como te podes proteger da doença com base nos conselhos da família e amigos? "

- 31 "... decidir como podes proteger-te da doença com base em informações com origem nos meios de comunicação? (por ex. Jornais, folhetos, internet ou outros meios de comunicação) "
- 32 "... encontrar informações sobre atividades saudáveis tais como atividade física, alimentação saudável e nutrição? "
- 33 "... saber mais sobre as atividades que são boas para o teu bem-estar mental? (por ex. meditação, exercício, caminhada, pilates, etc) "
- 34 "... encontrar informações que indiquem como é que o teu bairro poderia ser mais amigo da saúde? (por ex. redução de ruído e poluição, a criação de espaços verdes, de lazer)"
- 35 "... saber mais sobre as mudanças políticas que possam afetar a saúde? (por ex. legislação, programas de rastreio de saúde, novas mudanças de governo, de reestruturação de serviços de saúde, etc)"
- 36 "... saber mais sobre os esforços para promover a tua saúde em meio escolar? "
- 37 "... compreender conselhos sobre saúde que te chegam dos familiares ou amigos? "
- 38 "... compreender informação contida nas embalagens dos alimentos? "
- 39 "... compreender a informação com origem nos meios de comunicação sobre a forma de te tornares mais saudável? " (por ex. Internet, jornais, revistas) "
- 40 "... compreender a informação que visa manter a mente saudável? "
- 41 "... avaliar como o local onde vives, afeta a tua saúde e bem-estar? " (por ex. a tua comunidade, teu bairro)
- 42 "... avaliar como as tuas condições de habitação te ajudam a permanecer saudável? "
- 43 "... avaliar que comportamento diário está relacionado com a tua saúde? (por ex. beber álcool, hábitos alimentares, exercício, etc) "
- 44 "... tomar decisões para melhorar a tua saúde? "
- 45 "... entrar num clube de desporto ou aulas num ginásio se desejares?
- 46 "... influenciar as condições da tua vida que afetam a tua saúde e bem-estar? (por ex. ingestão de álcool, hábitos alimentares, exercício etc) "
- 47 "... tomar parte das atividades que melhoram a saúde e o bem-estar na tua comunidade

Portuguese version (for adolescents) of the European Health Literacy Survey instrument HLS-EU-PT©
the CrAdLiSa project - incrementando nas CRianças e ADolescentes a LIteracia para a SAúde.
(www.literacia-saude.info)

USING INTENSIVE GAMES DEVELOPMENT PROJECTS TO TEACH ENTREPRENEURIAL SKILLS TO THIRD LEVEL STUDENTS

Derek O'Reilly¹, Fernando Almeida², Krzysztof Podlaski³, Hiram Bollaert⁴,
Piotr Milczarski³, Shane Dowdall¹, Artur Hlobaž³ & Justino Lourenço²

¹Dundalk Institute of Technology (Ireland)

²Instituto Superior Politécnico Gaya (Portugal)

³University of Lodz (Poland)

⁴Artesis Plantijn University College (Belgium)

Abstract

Teaching entrepreneurial skills to third level students is becoming increasingly recognized as a necessary skill for them to thrive in the 21st century. Across the E.U. and globally, the teaching of entrepreneurial skills is progressively being incorporated into the core syllabus that students take during their time in third level education. However, despite the efforts of policy makers and educators, entrepreneurship is still not widespread among graduates.

This paper discusses the impact on student attitudes toward entrepreneurship of an E.U. intensive programme (called WalkAbout) that has run for the past two years. In the first year, 28% of the projects were developed further at the request of external stake holders. In the second year, 40% of the projects were developed further. In this paper we discuss the reasons as to why this programme is so successful in motivating students to further develop their projects in an entrepreneurial fashion.

Keywords: *entrepreneurial learning, entrepreneurship education, project-based learning; team-based learning, GGULIVRR, WalkAbout*

1. WalkAbout programme structure

The aim of a WalkAbout project is to get students from different EU countries and different degree programmes to work in teams to create mobile games in a given context within a short period of time. The time span of the project is about ten days. During this time, the student teams are challenged with the task of building functioning GGULIVRR (Generic Game for Ubiquitous Learning in an Interactive Virtual and Real Reality) games in a given context. GGULIVRR is a concept for contextual and mobile learning games that can be built by diverse teams.

Entrepreneurs need to be skilled in diverse areas, such as interpersonal skills, communication, planning, leadership, management and marketing. With this in mind, WalkAbout teams are purposely comprised of students from different degree programmes and different countries. To date, students from Poland, Finland, Belgium, Ireland and Portugal have taken part in the two Walkabout projects. These students came from computing, international marketing, teacher training, visual arts, games development and business degree programmes. The students' year of study ranged from year 1 to year 3. Combining such a diverse set of students ensures that each team has the combined skillset of an entrepreneur.

The key to the success of the programme is in ensuring that the task that is assigned to the student teams requires the full engagement and buy-in of all of the team members. The teams are tasked with designing, developing and marketing a GGULIVRR game. The teams are expected to present their game prototype and business plan to a panel of invited industrial leaders at the end of the ten day programme. In order to be successful, the teams need to investigate the game context, find attractive and inviting ways in which to play the game, find and implement various software solutions, overcome hardware technical difficulties and learn to communicate effectively with their teammates so that they can optimize their collaboration.

2. Entrepreneurship

According to an EC report on the “Effects and Impact of Entrepreneurship Programmes in Higher Education”, an entrepreneurial person demonstrates three key entrepreneurial competencies. These are entrepreneurial knowledge, skills and attitudes (EC, 2012). These competencies manifest themselves in the individual in the form of innovation, change and action that is essential for personal, social and work life (Mensah, 2013). Every entrepreneur masters a broad knowledge of business management. Entrepreneurs are very familiar with the economical, commercial, legal, social and organizational facets of business.

Entrepreneurship is now considered to be a major contributor to global economic growth (McStay, 2008; Mason, 2011). In recent years, entrepreneurship has gained much prominence in both developed and developing nations and has thus created a higher demand for entrepreneurship education. This sentiment is backed by Eickhoff who states that young people should be taught entrepreneurship education (Eickhoff, 2008). Thus, there is an increasing emphasis on education as a way to encourage entrepreneurship as a catalyst for economic development. Studdard et al. considers that entrepreneurship education will not only increase the skill levels of future entrepreneurs, but will also increase the skill levels of those pursuing non-entrepreneurial careers in the new economy (Studdard, 2013). Cooney states that interest and demand for entrepreneurship modules is growing among science, engineering, and arts faculties (Cooney & Murray, 2008). It is widely accepted that it is no longer enough to come out of third level education with a purely technical education.

At third level, entrepreneurship is widely recognized as a fundamental behavior that should be taught to students. Universities are increasingly being challenged by governments and funding agencies to expand entrepreneurship and enterprise education. This demands innovative pedagogical approaches that should be designed to stimulate and simulate the practice of entrepreneurship behaviors and the life-world of entrepreneurial firms, whilst retaining rigorous academic standards of measurement and assessment and, therefore require staff development (Kakkonen, 2010; EC, 2011). As an example, the UK “National Council for Entrepreneurship in Education” (NCEE) has set out a number of associated competencies for students and has developed educator programmes designed to stimulate staff from any department in a third level college to develop entrepreneurial approaches to their curriculum and programme development (Gibb, 2012). Gibb considers that of particular importance is the simulation of the entrepreneurial life-world of ownership, intuitive decision making and risk taking, initiative taking, holistic project management, ‘know-who’ network development and relationship management and commitment over time to see things through (Gibb, 2011).

There are various views as to how entrepreneurship can be embedded into third level teaching. According to the World Economic Forum (WEF), entrepreneurship education should comprise the following three elements (WEF, 2009): personal; business development; entrepreneurial skill. According to the United Nations Conference on Trade and Development (UNCTAD), there are four key policy areas and programmes that should be considered in the development of entrepreneurship education (UNCTAD, 2011): embedding entrepreneurship into education and training; curriculum development; teacher development; and partnership with the private sector. The South East European Centre for Entrepreneurial Learning (SEECLE) states that entrepreneurial learning has two distinct strands (narrow and broad). The former is being an entrepreneur engaged in a commercial activity; the latter is being entrepreneurial (SEECLE, 2011). The European Commission Council clarifies that entrepreneurship education should not be confused with general business and economic studies (EC, 2008). Its goal should be the promotion of creativity, innovation, and self-employment, and may include such as the development of personal attributes and skills, raising the awareness of students about self-employment and entrepreneurship as possible career options, working on concrete enterprise project and activities, and providing specific business skills and knowledge of how to start a company and run it successfully. The EACEA states that entrepreneurship education can be integrated into general education in three different ways: it can be integrated into existing subjects, it can be introduced as a separate curriculum subject or it can be implemented using a cross-curricular approach (EACEA, 2012).

The traditional teaching approach, prevalent in many universities, is passive learning. Learners receive lectures for the majority of class time, leaving them little opportunity to give input through discussions or experiential exercises. Although very effective to cater large groups of students a large amount of learning content within a relatively small amount of time, this approach is clearly unable to engage learners into actively practice the entrepreneurial attitude and increasingly feel the rush to act and take a risk. What really distinguishes an entrepreneur is the person’s attitudes and skills on how to run a business (Forbes, 2013). With a hands-on approach, they draw up business plans, market a product or service, propose and arrange contracts, conquer and expand market positions, lead employees and regulate daily affairs. Consequently entrepreneurship is not something one learns to understand, but

something one becomes fluent in through practice. Being coached instead of lectured by their teachers, learners appreciate an environment in which creativity and risk-taking are encouraged and mistakes are valued as learning opportunities. Entrepreneurship education should focus on project based learning facilitating real life learning experiences (EC, 2013). The learners practice to be entrepreneurial by collaborating in multi-disciplinary teams, tackling concrete and tangible real-world problems. Along the way they acquire knowledge, identify and solve subset problems and learn to cooperate.

3. WalkAbout intensive programmes

To date, two WalkAbout intensive programmes have taken place.

The first Walkabout intensive programme took place in Parque Biológico de Gaia, Portugal in April 2013. Parque Biológico de Gaia is a 35 hectare park that comprises woodlands and a zoological garden. A total of 40 students and 12 lecturers from Poland, Finland, Belgium, Ireland and Portugal took part in this project. During the programme, students grouped themselves into teams of five, one from each of the countries involved. Originally, eight teams of five students were formed. However, due to some local students becoming unavailable and a travelling student becoming sick, it became necessary to rearrange the remaining students into seven teams. At the end of this intensive programme, two of the seven teams (28%) were asked by the Parque Biológico de Gaia to develop their games further.

The second Walkabout intensive programme took place in the city of Lodz, Poland, in September 2014. A total of 28 students and nine mentors from Poland, Finland, Belgium and Ireland took part in this project. Five teams were formed. At the end of this intensive programme, two of the five teams (40%) were asked to further develop their games.

Both of the intensive programmes were about ten days in duration. At the very beginning of the programme, students were informed that each team would need to develop a QR code driven mobile game, which would need to be based around the context of either the Parque Biológico de Gaia or the city of Lodz. The students were not directed as to the focus of their game or the mechanics of their game. Students were informed at the beginning of the programme that they would need to form their own teams, subject to certain pre-defined criteria. These criteria were imposed so as to would guarantee a good spread of each nationality across the various teams. Furthermore, students were told that each team member would need to identify their role within their team and justify that role as being necessary.

Interpersonal skills are the life skills we use every day to communicate and interact with other people, both individually and in groups. From the beginning, students needed to show strong interpersonal skills in order to get placed on a team that was to their liking. Once a team was formed, interpersonal skills were needed to help individuals shape the direction that their team was travelling. This skill became particularly crucial later in the project life-cycle as the students became tired and pressurized. Teams that had one or two people who had excellent interpersonal skills were able to proceed with their projects much more smoothly than other teams.

The smooth development of a team's game relied on the ability of the team members being able to communicate effectively with each other. Team managers were tasked with ensuring that all voices on their team were heard and that all opinions counted as being equally important. Teams who communicated with each other well in the early stages of the project ended up being very solid and unified toward the more intense final stages of the project. It was very evident during the final presentations that the teams who communicated well got a huge amount of collective enjoyment from their time together working on the project. It was also clear that this enthusiasm came across to the external experts in their judging of the quality of the final presentations.

Once the teams were formed, each team had one of its members delegated as the team manager by the mentors. Technically trained students were purposely excluded from being team managers. The aim of this was to ensure that projects focused on both the creative and technical aspects of game design, rather than just the technical aspects. In some cases, the team manager stepped aside (sometimes involuntarily) and let other team members lead their team. However, the teams that had a strong team leader who took on their responsibilities in an honest and earnest way progressed more efficiently and effectively than the other teams did. Good managers showed an attention to detail and were able to organize their teams limited time effectively. Good managers were able to motivate their team to buy in to the project and to produce a very high quality of work. All four of the teams that were developed further had very strong managers.

Business planning encompasses all of the goals, strategies and actions that are required for a business to prosper. The students were required to come up with an idea, storyboard it, programme it and present it. To this end, the students were asked to make three presentations over the ten days. The first presentation, which occurred after two days, focused on the game concept and storyboard. The second presentation, which occurred after 6 days, focused on a proof-of-concept of some technical aspect of the

game and on a business plan for potentially developing the game into the future. The final presentation, which took place on the last day, required the students to present their games to an invited audience of industrial and academic partners. Excellent planning was an absolute requirement in order for teams to cope with the multitude of varying tasks that needed to be performed over the ten day period. In order to do these things effectively, the team managers needed to delegate effectively. While some students were programming, others needed to be out gathering content for their games. While some students were producing presentations, others were conducting surveys with potential users. The teams that planned effectively produced more polished games and presentations.

Marketing involves promoting and selling a team's game. Marketing includes market research and advertising. Various marketing ploys were engaged by the different teams. However, the teams who really believed in their game and in their team's ability to build the game tended to produce more polished presentations. As the days went by, all of the teams became more effective at marketing their games. All of the teams became increasingly aware over the life-cycle of the project of the importance of marketing in getting an external entity to want them to fully develop their game. Over the course of the three presentations, it was clear that students were evolving to follow best-practice and that the quality of the presentations increased dramatically as students came to realize its importance. Professional market research and very polished advertising videos featured prominently in many of the final presentations. All four of the games that were developed further paid enormous detail to the execution of their presentations.

We believe that the success of the four games that the external stake holders requested be developed further was directly related to how much those teams adapted of the core entrepreneurial skills.

4. Conclusions

Teaching entrepreneurial skills to students is very difficult in a classroom. With this in mind, colleges across the EU and globally have tried to adapt various measures to make entrepreneurship teaching more focused and 'real-life'. As with all learning, deep learning is only achieved when students fully engage with the subject that is being taught. Students need to 'do' to really understand. We believe that the approach taken in the WalkAbout projects is an excellent method for teaching entrepreneurial skills in a very real, hands-on, environment.

The WalkAbout projects forces students to realize that a successful business is more than just a piece of code or a storyboard or a business plan. WalkAbout projects take students outside of their comfort zone by presenting them with a cross-disciplinary project. This coupled with the international aspect of the project forces students to engage with the skills that are required to be a successful entrepreneur.

Students who took part in the WalkAbout projects were not given any formal lessons in the subject of entrepreneurship while on the project. Instead, they utilized and evolved their own skills during the life-cycle of the project. Future incarnations of the project may include some formal classes on the subject of entrepreneurship, as we now believe that this could result in the students achieving even more polished results.

References

- Cooney, T., & Murray, T. (2008). *Entrepreneurship Education in the Third-Level Sector in Ireland*. Dublin: Institute of Minority Entrepreneurship Report in Dublin Institute of Technology.
- EACEA (2012). *Entrepreneurship Education at School in Europe: National Strategies, Curricula and Learning Outcomes*. Brussels: Education, Audiovisual and Culture Executive Agency.
- EC (2008). *Entrepreneurship in Higher Education, Especially in Non-Business Studies*. Brussels: Final Report of the Expert Group of European Commission.
- EC (2011). *Entrepreneurship Education: Enabling Teachers as a Critical Success Factor*. Brussels: Brussels: European Commission, Entrepreneurship Unit of Directorate-General for Enterprise and Industry.
- EC (2012). *Effects and Impact of Entrepreneurship Programmes in Higher Education*. Brussels: European Commission, Enterprise and Industry Directorate-General.
- EC (2013) *Entrepreneurship Education, a guide for Educators*. Brussels. http://ec.europa.eu/enterprise/policies/sme/promoting-entrepreneurship/files/education/entred-manual-fv_en.pdf
- Eickhoff, M. (2008). *Entrepreneurial Thinking and Action - An Educational Responsibility for Europe*. European Journal of Vocational Training, 45, 5-31.

- Ernest, K., Matthew, S., & Samuel, A. (2015). *Towards Entrepreneurial Learning Competencies: The Perspective of Built Environment Students*. *Higher Education Studies*, 5(1), 20-30.
- Forbes (2013) *Working with an Entrepreneurial Attitude is a Powerful Addiction*. Online. <http://www.forbes.com/sites/glennllopis/2013/01/15/working-with-an-entrepreneurial-attitude-is-a-powerful-addiction/>
- Gibb, A. (2011). *Concepts into practice: Meeting the challenge of development of entrepreneurship educators around an innovative paradigm: The case of the International Entrepreneurship Educators Programme (IEEP)*. *International Journal of Entrepreneurial Behaviour and Research*, 17(2), 146–165.
- Gibb, A. (2012). *Exploring the synergistic potential in entrepreneurial university development: towards the building of a strategic framework*. *Annals of Innovation Entrepreneurship*, 3. Available at: <http://journals.co-action.net/index.php/aie/article/view/16742> (accessed on 30 Jan. 2015).
- Heinonen, J., & Poikkijoki, S. (2006). *An Entrepreneurial-Directed Approach to Entrepreneurship Education: Mission impossible?* *Journal of Management Development*, 25(1), 80-94.
- Ilie, V. (2014). *Developing Entrepreneurial Competencies in Students through Constructivist Education*. *Educational Journal*, 3(5), 293-302.
- Kakkonen, M. (2010). *Entrepreneurial Learning and Learning Strategies of the First Year Business Students in Higher Education*. *International Journal of Euro-Mediterranean Studies*, 3(1), 1-18.
- Mason, C. (2011). *Entrepreneurship Education and Research: Emerging Trends and Concerns*. *Journal of Global Entrepreneurship*, 1(1), 13-25.
- McStay, D. (2008). *An Investigation of Undergraduate Student Self-Employment Intention and the Impact of Entrepreneurship Education and Previous Entrepreneurial Experience*. Australia: School of Business, Bond University.
- Mensah, M. (2013). *Entrepreneurship Education on Wholesale? Considerations on Didactics and Pedagogy for Enhanced Graduate Employment in Ghana*. *European Journal of Business and Management*, 5(15), 109-113.
- SEECCEL (2011). *Entrepreneurial Learning: A Key Competence Approach*. Zagreb: South East European Centre for Entrepreneurial Learning.
- Studdard, N., Dawson, M. & Jackson, N. (2013). *Fostering Entrepreneurship and Building Entrepreneurial Self-Efficacy in Primary and Secondary Education*. *Creative and Knowledge Society*, 3(2), 1-15.
- UNCTAD (2011). *Entrepreneurship Education Policies*. Geneva: Trade and Development Board Investment, Enterprise and Development Commission.
- WEF (2009). *Educating the Next Wave of Entrepreneurs*. Switzerland: World Economic Forum.

TEACHING IN VALUES IN HIGHER EDUCATION: INNOVATION BY ONLINE DIALOGUE BETWEEN STUDENTS FROM DIFFERENT UNIVERSITIES

Elena Briones, Raquel Palomera & Alicia Gómez-Linares
Department of Education, University of Cantabria (Spain)

Abstract

Training in values for pre-service teachers is a principal objective of EHEA, developed through a subject called -Training in values and personal competencies for teachers- of both degrees, Early Childhood and Primary Education, at the University of Cantabria. Given the pros and cons identified in previous courses using the dialogue technique of a moral dilemma in gradual panel discussions, we optimized its design. In order to encourage students' cognitive flexibility and their argumentative skills, we added preparatory exercises about argumentation, and values clarification. Also, diversity within the group of students was promoted, so, 503 students and 10 professors of three international Universities participated and were divided in groups regarding one of the four conditions of this innovative educational experience. Student groups belonged to one of the three diversity conditions based on their age, degree or cultural origin were combined to discuss online whereas, in the control condition, the students developed all panel discussions in the classroom exclusively with their classmates. The students' performance (quality of reflections pre- and post-discussions and online participation) were rated by the professors, who used the same rubric. At the same time, students reported regarding their educational experience, perception on classroom climate, methodology, learning, personal impact, and their involvement in the debates. Results showed that the best reflections were done by students in conditions that presented diversity in opposite to the control group; also these students qualified their own participation in debates as adequate, usually expressing their opinion with reasons and respectfully, whereas those of control condition considered their own involvement as inadequate. The educational experience was well appraised: its utility for daily life -i.e. to improve the self and world knowledge, the mental flexibility and the skills for discussion-, to create a relaxed, pleasant, and respectful climate at classroom and to encourage students in finding information and materials, reflection and participation. However the participatory character of the technique was less satisfactory for students in the cultural diversity condition, who described difficulties using the wiki for the discussion with their twinned group. The main conclusions are the potential of this innovative experience to promote discursive and argumentative skills, perspective taking and positive attitudes in the classroom and in daily lives; also, the need for accessible online resources into the Universities to enable discussion among students despite the physical distance and time difference.

Keywords: *Dialogue, diversity, higher education, moral dilemmas, teaching in values*

1. Introduction

Training in values is an objective of the European Higher Education Area (EHEA) in order to contribute to social responsibility and socio-cultural change from University. Aware of this need, the University of Cantabria (UC, Spain) has favored the Training in values and personal competencies for teachers in the syllabus of the Early Childhood and Primary Education Degrees. It aims that students develop their moral, social, emotional and communicative competences through argumentation, debate and cooperative work and also develop ethical compromise with a type of education based in democratic and inclusive values. The pros and cons analysis of our experience in teaching in values lead us to consider the benefits from measures to ensure different perspectives, diverse argumentative styles and experiential examples during discussions. Given the above, we have designed and developed an innovative educational experience -recognized and supported by the UC- to teach in values, founded in the following cornerstones:

1) An active methodology based in a dialogic technique to promote values identification and positioning to moral dilemmas, avoiding indoctrination in students (Cantillo et al., 2005; Lopez, Carpintero, Del Campo, Lázaro & Soriano, 2010).

2) Training argumentative strategies, since that the psychological processes involved in them are linked especially with Ethics: argue means the opposite of assuming dogmatic positions (Yepes, Rodríguez & Montoya, 2006).

3) Managing debates and collaborative groups. The progressive panel technique is chosen because it promotes a climate of veracity and encourages students to participate actively in the debates (Barckley, Cross & Howell Mayor, 2007; Villafaña, 2008).

4) Facilitating diverse perspectives on a dilemma to challenge the students' capacities for reflection, perspective taking, argumentation and respect for different views.

5) Facilitating the meta-knowledge of the student's values and their influence on their diary decisions and behavior.

2. Objectives

The purpose of the study is the development and evaluation of an innovative international educative experience to promote metaknowledge, critical thinking, argumentative skills, perspective taking and respect for different approaches.

3. Design

Different training conditions were created to enhance diversity during the discussion. So three groups based on combinations of age, degree or cultural diversity were created. In order to get it, we invited to participate to other universities from same and different country. Also, discussion between students was facilitated online through two TIC's conditions: forum or wiki. A control group in which diversity and TICS were not enhanced was also created. All groups followed progressive panel discussions in the classroom with their classmates (see Table 1).

4. Method

4.1. Sample

503 students from three Universities participated. In Table 1 can be checked the sample distribution between the training conditions. Only the 37.77% of them answered the final measures regarding the perception of the educational experience (109 UC students and 81 students from the invited Universities).

Table 1. Description of the sample regarding the conditions of the training.

Conditions	Debates Conditions	UC	Invited Universities	Total
Age diversity (1)	Online in a Forum and in the classroom	99	23	122
Degree diversity (2)	Online in a Forum and in the classroom	43	69	112
Cultural diversity (3)	Online in a wiki and in the classroom	92	91	183
Control (4)	Not online debate, only in the classroom	86		86
Total		320	183	503

4.2. Procedure and presentation of the innovative training in values experience

The sequence of actions is summarized in the following steps (see detail in Briones, Gómez-Linares & Palomera, 2014):

a) *Local agreements and coordination between the participating universities* (e.g. commitments, protection of the students' data, etc.).

b) *Professors of UC build the educational tools and the moral dilemma to share them with professors of invited Universities* (presentations of the methodology, script of sessions, instructions for classroom management, assessment rubric, basic bibliography...). It was carried out through several face meetings or by skype and these materials were shared in an online platform.

c) *Creation of discussion groups with a different combination of students* (according with the described conditions) to further expand the exchange of stakeholder experience and input.

d) *Facilitation of TIC for the online discussion*. Two kinds of online tools were used. Those students of age and degree diversity conditions used a Moodle's forum of their universities. Their group discussions carried out in classroom were published on the twinned groups Moodle's forum. So students could read the reflections of the twinned group and debated about them online—but not between them-. Students of the cultural diversity condition used a Moodle's wiki. Students from the invited university of this condition had access to use only this resource of the UC. So they shared their conclusions of the classroom group discussion and debated online, exchanging opinions with the twinned group.

e) *Launching of the training sessions* (see Table 2). In classroom are presented the methodology and the dilemma and, students carried out readiness exercises on argumentation and values clarification. Once they do their reflection out of classroom, they start the debates following the progressive panel. This technique consists on discuss first in small groups around five students and, second with all classroom. Students in diversity conditions also discuss with the twinned group. Students do individual reflections, pre and post-discussions, that deliver to professors. Finally, the participants are invited to assess online the experience.

Table 2. Schedule of activities carried out with the students

Week	Classroom activities	Out of classroom activities
1st	Presentation of the educational experience Readiness exercises: - values clarification, - practicing argumentation Presentation of the dilemma	Reflection on the dilemma pre- discussions.
2nd	Debate following the technique of the Progressive Panel.	In diversity conditions, the minutes of group discussion are shared with the twinned group.
3rd	Great debates in the classroom	Reflection on the dilemma post-discussions.
4th	Delivery of both individual reflections: pre- and post- discussions	Online evaluation of the experience

4.3. Instruments

A) Students' reflections about a dilemma and online participation:

The characteristics of the rubric used for professors to evaluate their performances are described in Table 3.

Table 3. Rubric used by professors to evaluate students' performance (reflections on dilemma and online participation)

Evaluation criteria	Score
Reflection on the dilemma pre- discussions: - Identify values and anti-values - Write individual positioning using several arguments - Recognize other positions and counterarguments	25%
Participation on the online discussion - Share online the minutes of group discussion - Make comments to the twinned group using different arguments	35%
Reflection on the dilemma post- discussions: - More values and anti-values are recognized - The reflections are enriched developing arguments shared in the group discussions. - Different arguments are used and metacognition is reached.	40%

B) Perception of the educational experience and their own involvement on it:

Students reported regarding their *educational experience perception* using a 5-points Likert scale ranging from 1 (nothing) to 5 (very much) to rate the following variables:

- Classroom climate during debates by means of these seven adjectives ($\alpha=.67$, $N=186$): "tense, relaxed, friendly, passive, respectful, participatory, empowering" (tense and passive were recording).

- Methodology of the educational experiences by mean of 11 items ($\alpha=.82$, $N=190$) adapted from the scale created by Cantillo et al. (2005, p. 68). Examples of items are "It has pursued an active and participative methodology", "It has allowed individual reflection".

- The personal contributions of this experience were assessed using 18 items ($\alpha=.93$, $N=181$) covering the issues identified by students in previous studies (Briones, Palomera & Gómez-Linares,

2014), some examples are: “be more aware of my values and anti-values in making decisions” and “understand other ideas different from mine”. Also we created two general factors: Cognitive flexibility ($\alpha = .82$, 6 items) and Self knowledge ($\alpha = .91$, 12 items).

Moreover the students rate their *involvement in the debates* using two items, one regarding their participation on classroom debates and another about their online participation. These items ranged from 1 (nothing at all) to 10 (very much). The *quality of this involvement* was measured through six items ($\alpha = .62$, $N=189$) taken from Cantillo et al. (2005, p. 69). Students answered using a frequency scale where 1 implies never, 2, sometimes and 3, always. Some examples of items are: “When I want to participate I ask for the floor” and “I do not make personal attacks”.

Finally, students indicated by four open questions what they *liked most and least, what they have learned and suggest improvements for future editions*.

5. Results

To check the effectiveness in terms of performance and assessment of the educational experience were carried out non parametric analysis, because of the unequal size of conditions.

5.1. Educational conditions and performance (reflection and participation)

Results showed that the best reflections were done by students in diversity conditions (Kruskal Wallis test: $\chi^2(3)=135.14$, $p < .001$); also these students qualified their participation in classroom debates qualitatively ($\chi^2(3) = 6.45$, $p = .09$) and quantitatively ($\chi^2(3) = 13.99$, $p < .01$) adequate, whereas those of control condition considered as inadequate (see Table 4). In this sense Wilcoxon Signed Rank test -test (value= 2-: $T1=3.00$, $T2=3.78$, $T3=3.13$; $p < .01$) showed that only for control group, their scores were not higher than median point of the scale ($T4=-0.86$; ns). There were not differences in the perception of online participation between diversity conditions ($\chi^2(2) = 4.02$, ns).

Table 4. Median scores on performance, participation and perception of own participation.

	Performance (1-100%)	Pre- Discussion Reflection (1-25%)	Participation (1-35%)	Post- Discussion Reflection (1-40%)	Quality of participation (1-5)	Perception of Participation in classroom (1-10)	Perception of Online Participation (1-10)
Age Diversity	65.14	18.86	28.04	18.24	2.17	5	6
Degree Diversity	70.03	19.45	24.09	26.49	2	6	7
Cultural Diversity	57.71	16.11	15.59	26.02	2.33	7	7.5
Control	49.76				1.83	3	

5.2. Educational conditions and assessment of the educational experience

The educational experience was positively appraised in terms of (see Figure 1):

- The optimum climate created at classroom during debates: it was significantly positive in all training conditions (Wilcoxon Signed Rank test -test value= 3-: $T1=6.50$, $T2=7.65$, $T3=5.24$, $T4=2.68$; $p < .01$) without difference between them (Kruskal Wallis test: $\chi^2(3)=5.65$, ns).

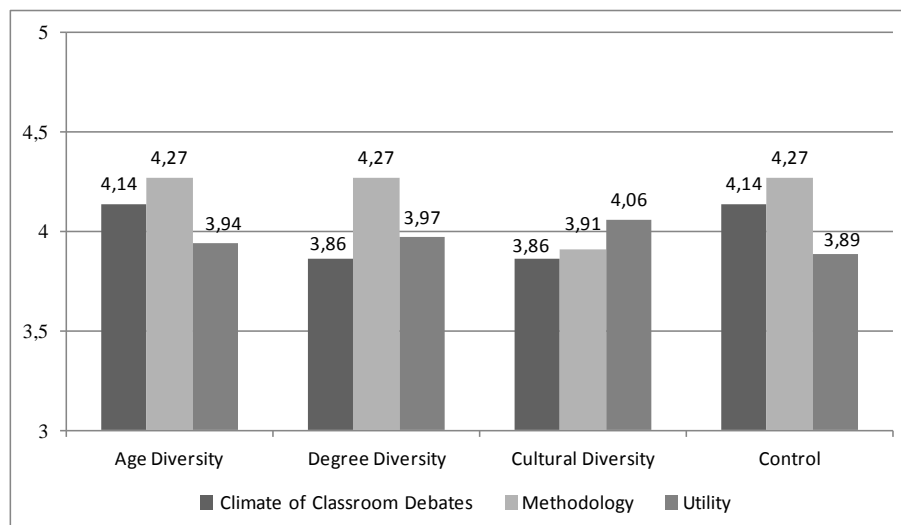
- The encouragement of reflection and participation, since the methodology was significantly appraised positively in all training conditions (Wilcoxon Signed Rank test -test value= 3-: $T1=6.52$, $T2=8.06$, $T3=5.29$, $T4=2.69$; $p < .01$, and in any factor of this variable) and without any difference in the perception of interest and reflection awakened by the methodology ($\chi^2(3)=5.58$, ns) or the respectful participation in debates ($\chi^2(3)=1.27$, ns). However, comparisons of methodology in general ($\chi^2(3)=9.28$, $p < .05$) and the active participation ($\chi^2(3)=23.89$, $p < .001$) were significantly different, being worse assessed by the group of cultural diversity.

- The contribution of this educational experience in various aspects of their lives (without differences between training condition; $\chi^2(3)= 0.98$, ns): for their own knowledge ($\chi^2(3)=0.89$, ns) and cognitive flexibility ($\chi^2(3)=0.50$, ns). These appraisals were significantly positive in all training conditions (Wilcoxon Signed Rank test -test value= 3-: $T1=6.15$, $T2=7.97$, $T3=4.86$, $T4=2.67$; $p < .01$, and in each factor of this variable).

The analysis of the open questions confirmed the positive appraisal of the educational experience and allowed to explain that the participatory character of the technique was less satisfactory for the

cultural diversity condition because students had difficulties to use the wiki for the discussion with their twinned group, in contrast to the others groups that used online forums without any problems.

Figure 1. Representation of the median scores on the variables of the educational experience perception.



6. Conclusions

Two key conclusions from this innovative experience are: first, the potential of this experience based on the dialogic tool to promote personal and ethics competencies such as discursive and argumentative skills, perspective taking and attitudes in the classroom and in daily lives. But it is also a fact in which more efforts are needed for training the argumentative competence and also to listen and consider other points of views. This last point is connected with the second main conclusion: any program for teaching in values in higher education needs to adequate atmosphere, sequencing and selection of activities, an effective coordination of these activities between all participants (staff, students, professors, etc) and accessible online resources. All these considerations would facilitate University to be a reference in ethical training, as we all should expect from the EHEA.

References

- Barckley, E. F., Cross, K. P. y Howell Mayor, C. (2007). *Técnicas del aprendizaje colaborativo*. Ediciones Morata: Madrid.
- Briones, E., Gómez-Linares, A y Palomera, R. (2014). *Universidad y valores personales: una apuesta por la internacionalización, la diversidad y el diálogo en la formación*. Proceedings of XIII Congreso Internacional de Formación del Profesorado (pp. 1263 – 1272), Santander (España).
- Briones, E., Palomera, R. y Gómez-Linares, A (2014). *Dilemas de la formación en valores en los grados de Magisterio*. Proceedings of XI Foro Internacional sobre la Evaluación de la Calidad de la Investigación y de la Educación Superior (FECIES, p. 154), Bilbao (España).
- Canillo, J., Domínguez, A., Encinas, S., Muñoz, A., Navarro, F. y Salazar, A. (2005). *Dilemas Morales. Un aprendizaje de valores mediante el diálogo*. Valencia: Nau Llibres.
- López, F., Carpintero, E., Del Campo, A., Lázaro, S. y Soriano, S. (2010). Valores y desarrollo moral. En *El bienestar personal y social y la prevención del malestar y la violencia* (pp. 127-184). Madrid: Pirámide.
- Villafaña R. (2008). Dinámicas de grupo. Retrieved from <http://inn-edu.com/innovacion/DinamicasGrupales.pdf>
- Yepes, G. I., Rodríguez, H. M. y Montoya, M. E. (2006). Experiencia de aprendizaje 4: Actos discursivos: la argumentación. En G. I. Yepes, H. M. Rodríguez y M. E. Montoya (Eds.), *El secreto de la palabra: Rutas y Herramientas*. Retrieved from <http://aprendeenlinea.udea.edu.co/lms/moodle/course/view.php?id=437>

PROBLEM-BASED LEARNING IN SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) FOR 21st CENTURY GLOBAL LEARNERS

Diane Boothe¹ & Melissa Caspary²

¹*Boise State University, University, Idaho (USA)*

²*Gwinnett State College, Georgia (USA)*

Abstract

Education in the 21st century is undergoing a rapid transformation and universities have been criticized for failing to graduate students who are prepared to enter the workforce and compete globally. There is a shortage of highly qualified graduates in science, technology, engineering and mathematics (STEM) fields that are essential to economic growth. An emphasis on STEM disciplines and innovative learning environments that are connected, flexible, and collaborative is crucial for our future as employers expect a broad range of transferable competencies to prepare students for the global workforce.

Problem-based learning (PBL) continues to be at the forefront of best practices as educators strive to build a culture that fosters innovation and revitalizes the classroom experience as traditional learning is redefined. Our research focuses on the impact of PBL to strengthen the increasing role of collaboration and teamwork and its impact on the learning environment. Educators are challenged to meet increased demands and infuse technology developing strategic objectives to meet a multiplicity of unique needs and varying learning scenarios in STEM, and PBL provides this opportunity for growth.

The research and oral presentation focuses on incorporating PBL across the STEM curriculum and strengthening learning by exploring and integrating PBL in the teaching and learning process. Results from three institutions in the United States will be shared. An overview of PBL will be presented and a toolbox using a variety of PBL resources for STEM suggested for strategies to address real world projects that actively engage STEM students in meaningful learning in this innovative model of instruction. Educators become facilitators and often the role of teacher and student change as instruction becomes student centered and collaborative teamwork challenges students through PBL teamwork and assessment.

As our research on PBL in the STEM fields is carefully analyzed focusing on students working at the evaluation, synthesis and analysis levels of learning, we will continue to investigate the number of students attracted to STEM fields and their success. Future research will expand to include employers in order to leverage their ideas as we strive for innovative models essential for success in the 21st century classroom, whether that classroom is explored digitally or characterized by active student engagement in a specific educational setting.

Keywords: *Problem-based, STEM, collaboration, innovation, engagement*

1. Introduction

Education in the 21st century is undergoing a rapid transformation and universities have been criticized for failing to graduate students who are prepared to enter the workforce and compete globally. There is a shortage of highly qualified graduates in science, technology, engineering and mathematics (STEM) fields that are essential to economic growth. Numerous complexities exist within our global workplace composed of multicultural environments, underserved populations and multilingual citizens. An emphasis on STEM disciplines and innovative learning environments that are connected, flexible, and collaborative is crucial for our future as employers expect a broad range of transferable competencies to prepare students for the 21st century global workforce.

Problem-based Learning (PBL) is a key contributor to empowering critical thinking and achieving success across the spectrum of STEM disciplines. The theoretical foundations and underpinnings of PBL are explored in a focused and contrasting self-directed learning environment that transforms the classroom experience and endeavors to boost learning outcomes. Creative and dynamic PBL activities are linked to multiple strategies for continuous, summative, and formative assessment. The

relevant and emergent strategy of using pedagogy that actively engages learners and incorporates a PBL model across multiple domains is a transformational learning method that increases performance and achievement. It influences the way that learning is sustained and reinforced, and extends it beyond the classroom and initial activity or product. Students utilizing real-world problem solution as they explore and incorporate innovative learning will boost outcomes, as educators build momentum for teaching and learning in 21st century global classrooms. This approach can also be expanded to myriad contexts and disciplines incorporating content and language acquisition across the curriculum. The US National Aeronautic and Space Administration (NASA) features numerous educational programs and suggests that, “STEM education combines integrated learning with investigation and questioning. While mathematics and science are the primary core subjects, there is also an emphasis on using technology and the engineering design process to investigate solutions to real-world problems. A STEM lesson should present a problem and encourage students to work together in teams to conduct research, gather data, and design and test solutions. Ideally, they will then communicate their findings and solutions, both locally and globally.” (NASA, 21st Century Learning.)

2. PBL Across the STEM Curriculum

PBL continues to be at the forefront of best practices as educators strive to build a culture that fosters innovation and revitalizes the classroom experience redefining traditional learning. This transformational learning strategy is based on three elements; achieving success in STEM fields through innovative pedagogy, creating hands-on PBL real world activities to empower students, and supporting learning by building partnerships and fostering collaboration. Added value is derived from competency-based content area knowledge that is acquired during this process. Our research focuses on the impact of PBL to strengthen the increasing role of collaboration and teamwork and its impact on the learning environment. Educators are challenged to meet increased demands and infuse technology developing strategic objectives to meet a multiplicity of unique needs and varying learning scenarios in STEM, and PBL provides this opportunity for growth. This paper features a showcase of best practices that hold a number of opportunities. Implemented in STEM, they are recognized as innovative and showing promise building momentum for teaching and learning in 21st century classrooms.

The research addresses the incorporation of PBL across the STEM curriculum and strengthening learning by exploring and integrating PBL in the teaching and learning process. Results from three institutions in the United States are shared. An overview of PBL is presented and a toolbox using a variety of PBL resources for STEM suggested for strategies to address real world projects that actively engage STEM students in meaningful learning in this innovative model of instruction. Educators become facilitators and often the role of teacher and student change as instruction becomes student centered and collaborative teamwork challenges students through PBL teamwork and assessment.

3. PBL Enhancing the Global Workforce

Because employers have criticized institutions of higher education for failing to provide students in STEM disciplines who are prepared to enter the workforce, it is even more relevant to focus on characteristics and learning styles that will meet the needs of the 21st century requirements for knowledge and skills. Representatives from business and industry often lament that students are not well prepared for collaborative problem solving or critical thinking, and they experience difficulty taking a team approach to workplace goals. We are convinced that robust PBL activities in the STEM fields result in positive outcomes that will extend to the workplace and are sustainable over time. An investigation of PBL collaterally used as a tool for strengthening learning in the 21st century holds a number of significant opportunities.

Initially, PBL evolved from the medical field to numerous disciplines and builds upon an assigned problem based on previously acquired knowledge. The learning expands as small groups of students collaborate to engage in activities resulting in solutions to support hypotheses. Educators become facilitators through the development of inclusion and engagement with members of the group. The pedagogical potential including meaningful research opportunities and analytics, as well as strategies for STEM educators to frame best practices focused on the diverse learning needs of students is significant.

Although this collaborative method is cutting edge for educational best practices, it may challenge mainstream or traditional method of learning where the learning is teacher centered rather than student centered. By focusing on real-world activities using an innovative multi-dimensional PBL model, learning further contributes to societal and cultural benefits and empowers students inspiring them to succeed in the workplace. Successful implementation requires cohesive plans for integrated professional development focusing on sustainability and building capacity addresses the growth metrics and structure

that PBL assessment contributes to STEM mastery. A crucial key to the success of PBL lessons is the design of a problem that is relevant and engaging for all participants.

4. PBL in Multicultural and Multilingual STEM Environments

Actively engaging learners in multicultural and multilingual environments not only successfully improves content area learning, but strengthens their language skills as well. Fried-Booth (2002) discusses the value of project work, not only to the content area, but in terms of language learning for those whose native language is one other than the language being used in the educational setting. In this case, the real-world language is distinctive enough to strengthen learning in the content area through language that is not predetermined by the instructor but evolves throughout the course of the conversation related to the project. When the added value is English language acquisition, PBL has been found to be successful in leveraging resources and engaging learners in relevant settings that reinforce and sustain successful outcomes. Quality language objectives serve to complement a content lesson strengthening content knowledge and skills in content area standards (Echevarria & Short, 2011). An interdisciplinary approach that strengthens intercultural communication is an additional advantage of PBL and provides essential bridges to the 21st century classroom. Furthermore, project/problem based learning also appeals to the social and cognitive aspects of learning (Larson-Freeman & Anderson, 2011).

5. Promoting Educational Success in STEM at the University Level

During an investigation of PBL in the science field at Gwinnett State College in Georgia, USA, five distinctive projects/problems were developed to actively engage students in the learning process. An interview with the professor revealed the critical steps incorporated to empower students and establish PBL learning opportunities in the sciences to promote learner autonomy and transfer learning beyond the classroom setting. Engagement and exploration coupled with appropriate pedagogy cross cultural and linguistic lines and stimulate learning. Science educators need to limit dependence on lecture-based formats as learning is understood as an interpretive process where new information is stored with links to what is already known (Mastascusa, 2011). This is clearly the case in the area of science as it lends itself to the enthusiasm that comes with discovery and innovative creativity. Five problems and an explanation of the activities associated with each of them are outlined below:

1. Botany Permanent Forest Plot Problem Solving: Students help establish a permanent forest survey plot both on the edge and in the interior of an urban forest. They then collect data on tree species identification, diameter at breast height, and crown class to add to the EREN database. They can use the data from the EREN database to look at urban forests across the United States to explore linear relationships to determine how much of the variation in the biological variables (species richness, stem densities, basal area, biomass, etc.) is explained by variation in any of the environmental variables (topography, climate, or soil).

2. Mycology Indoor Air Quality Problem Solving: Students grow fungal cultures of commonly known indoor air contaminants so that they might identify these in lab and have a positive control for the experiment. They then take an air quality sample from campus and are expected to identify 80% of the fungal species grown on the plate to explore questions about campus air quality and common fungal air contaminants in the indoor campus environment.

3. Biology Crime Scene Problem Solving: Students investigate a “murder crime scene” and use blood typing, hair samples, and DNA electrophoresis and learn about Polymerase Chain Reaction (PCR) to determine which of the suspects likely committed the crime.

4. DNA Barcoding Problem Solving: Students use molecular DNA to obtain a DNA barcode to make species identifications and determine biodiversity of the insect community on campus.

5. Plant-Pollinator Network Problem Solving: Students use insect pan traps to passively collect insects, then document floral species and analyze the dataset to draw correlations between insect type and floral preference.

At Boise State University, the College of Education collaborates with partner schools in the area. A PBL project is being planned with West Ada School District focusing on 21st century classrooms. West Ada School District is the largest district in the state of Idaho and is recognized as a strong national leaders in establishing 21st century classrooms with digitization and technology focusing on state of the art outcomes and learning experiences for students.

Students in Educational Technology create avatars and experience second life in a realm of virtual worlds. In these innovative courses, the concepts of social networking are taken as far as technology allows in the name of finding new and interesting ways for teachers and students to engage,

usually outside of the three-dimensional construct of the traditional classroom. It's a world in flux that's being explored even as it's being created (Dawley & Journee, 2010).

The Venture College at Boise State University focuses on entrepreneurship and development of creative business ventures. Venture College is highly selective and open to students in any major. It's a rigorous, noncredit experience beyond the traditional academic program and is led by highly experienced business executives and supported by more than 200 entrepreneurs, business people and civic leaders who volunteer their expertise. Students work through a business plan and problem solution to create an innovative business or market a product.

Boise State University is proud to have Dr. Barbara Morgan, the first teacher in space, as a distinguished educator in residence and member of the faculty working with NASA and the Idaho Science and Aerospace Scholars program. The NASA education website emphasizes the importance of STEM and PBL suggesting that STEM education combines integrated learning with investigation and questioning. While mathematics and science are the primary core subjects, there is also an emphasis on using technology and the engineering design process to investigate solutions to real-world problems. A STEM lesson should present a problem and encourage students to work together in teams to conduct research, gather data, and design and test solutions. Ideally, they will then communicate their findings and solutions, both locally and globally (NASA, 21st Century Learning).

At the University of Southern California in Los Angeles, a STEM Education Research Group has been established in the Viterbi School of Engineering. According to the website, its mission is to advance the careers and achievement of learners across the lifespan in STEM areas. The group's research schema has multi-dimensional theoretical contexts that enable impact focused studies in K-12, community college, and universities settings. Problem-based learning is a key aspect of this research and the teams targets academic, experiential and affective (human related) mediators in their research on student learning in STEM and the mediating factors to such learning and academic achievement in the K-12, community college, and universities educational contexts. Each area of research is interdisciplinary and linked to K-12, community college, or university STEM learning (or combinations of these settings) and utilizes a combined social cognitive /guided developmental theoretical frame. Additional information can be found at <http://stem-ed.usc.edu/>.

6. Assessment

Assessment of PBL in STEM fields is also a consideration worthy of particular attention. PBL is incorporated into classroom assessment techniques (CATs), portfolio assessments, peer assessments, self-assessments, reflective journals, writing samples, and authentic products that reflect individual and collaborative endeavours and meaningful learning. Opportunities for data gathering that support continuous improvement and connections to digital and hybrid learning merit exploration. Assessment tools and models require evaluation in order to tap into unique teaching styles and opportunities for incorporating PBL into the STEM curriculum i.e. flipping the classroom and developing a tool box of innovative activities to unlock the potential of PBL and nourish creativity. Ongoing evaluation of the benefits and challenges of PBL assessment in the STEM fields, culminating activities, and value-added data provides an opportunity for continuous improvement encouraging students and educators to be bold and creative with a mutual sense of accomplishment for the PBL process (Davies, J.; de Graff, E.; Kolmos, A. (2011). *PBL Across the Disciplines: Research into Best Practice*.

7. Conclusion

As our research on PBL in the STEM fields is carefully analyzed focusing on students working at the evaluation, synthesis and analysis levels of learning incorporating diverse technologies, we will continue to investigate the number of students attracted to STEM field and their success. This pilot study has focused on qualitative inquiry at this point and holds promise for an empirical study in the future. Disaggregated data taking numerous directions and focusing on specific content areas and goals is recommended for future consideration. PBL allows educators to leverage their new ideas and demonstrate the breadth of quality as they change their approach to teaching. Future research will expand to include employers in order to incorporate their ideas as we strive for innovative models essential for success in the 21st century classroom, whether that classroom is explored digitally or characterized by active student engagement in a specific educational setting. In summary, innovative PBL practices in STEM are crucial for success in the transformation of 21st century education in the new millennium as students and educators pursue their goals and embrace the demands of our rapidly evolving and expanding global society.

References

- Davies, J., de Graff, E., & Kolmos, A. (2011). *PBL Across the Disciplines: Research into Best Practice*. Aalborg: Aalborg University Press.
- Dawley, L., & Journee, M. (2010). Ed Tech: Leading the Way to Tomorrow's Classroom. Available online at http://edtech.boisestate.edu/newsletter/EDTECH_Dr_Lisa_Dawley.pdf retrieved November 25, 2014.
- Echevarria, J. & Short, D. (2011). *The SIOP Model: A professional development framework for a comprehensive school wide intervention*. Center for research on the educational achievement of teaching English language learners. (CREATE). Brief.
- Fried-Booth, D. (2002). *Project Work* (2nd edn.). Oxford: Oxford University Press.
- Larson-Freeman, D. & Anderson, M. (2011). *Techniques and Principles in Language Teaching*. (3rd edn.). Oxford: Oxford University Press.
- Mastascusa, E., Snyder, W., & Hoyt, B. (2011). *Effective Instruction for STEM Disciplines*. Weimer, M. (Ed). San Francisco: John Wiley & Sons.
- 21st Century Teaching and Learning with NASA, PBL and STEM available online at http://www.pbs.org/teacherline/courses/common_documents/stem/015/docs/stem412/s1_3.html retrieved November 20, 2014

EARLY SCHOOL LEAVING – CONTRIBUTIONS FROM PORTUGAL

Anabela Mesquita¹, Diana Vieira² & Paulino Silva³

¹CICE – ISCAP / Polytechnic Institute of Porto, Algoritmi Centre, Minho University (Portugal)

^{2,3}CICE – ISCAP / Polytechnic Institute of Porto (Portugal)

Abstract

Early school leaving (ESL) is a serious matter at individual and macro level since it is connected to unemployment, social exclusion, and poverty while impeding productivity and competitiveness. Young people who leave education and training prematurely are bound to lack skills and qualifications, and to face serious, persistent problems on the labour market. ESL represents great hardship for the individuals and huge costs for European economies and welfare states. Preventing ESL is a stepping stone towards improving the opportunities of employment for young people and for supporting smart, sustainable and inclusive growth. The InSchool – Innovation in Early School Leaving project addresses this problem by contributing to the identification and implementation of good practices already available in Europe. In this paper, we present the project, its aims, as well as some of these initiatives that are taking place in Portugal. Finally, we expect that the good practices presented may be inspiring for other schools and contexts.

Keywords: *Early School Leaving, Portugal, European Project.*

1. Introduction

Early school leaving (ESL) is a serious matter not only at the individual level but also at a macro level since it is connected to unemployment, social exclusion, and poverty while impeding productivity and competitiveness (European Commission, 2014a). With its shrinking workforce, Europe needs to make full use of its human resources. Young people who leave education and training prematurely are bound to lack skills and qualifications, and to face serious, persistent problems on the labour market.

In 2012, nearly five and a half million young people between 18 and 24 years old had not finished upper secondary education and were not in education and training. On average, the unemployment rate of these early school leavers is 40.1%, compared to 23.2% overall youth unemployment in Europe (European Commission, 2014b). ESL creates great hardship for the individuals and huge costs for European economies and welfare states. Tackling early school leaving is a stepping stone towards improving the opportunities of young people and for supporting smart, sustainable and inclusive growth.

There are many reasons why some young people give up education and training prematurely: personal or family problems, learning difficulties, or a fragile socio-economic situation. The way the education system is set up and the environment of each school are also important factors. Since there is not a single reason for ESL, there are no easy answers. Policies to reduce early school leaving must address a range of triggers and combine education and social policy, youth work and health related aspects such as drug use or mental and emotional problems (European Commission, 2014a).

It was in this scenario that the project InSchool – Innovation in Early School Leaving was developed. Its aims are to contribute to the identification and implementation of some of good practices already available in Europe. In fact, if we take a close look to what is going on in Europe and in some schools, we notice that there are a lot of initiatives, some of them already with positive results. In this paper, we will present the project, its aims, as well as some of these initiatives that are taking place in Portugal. Statistics show that the figures for Portugal as ESL is concerned are not favorable. However, organizations, schools and teachers are aware of this problem and are motivated to mitigate this phenomenon as long as the reasons for these figures concern learning difficulties and the educational environment. Finally, we expect that the good practices presented may be inspiring for other schools and contexts.

2. Early School Leaving in Portugal

The indicator of early leavers from education and training is one that best expresses the educational inequalities between countries. Although the tendency for this indicator to decrease in all European countries in the last 20 years, during this period Portugal has presented average values above those of the EU. Nevertheless, the gap has diminished in the last decade. Furthermore, according to Eurostat (2013), it is possible to see that southern countries, like Spain, Turkey and Portugal, present the higher figures for this indicator. The inequalities of this indicator show that there are great differences among EU countries. The countries with lower rates (between 4% and 9%) are Finland (8,9%), Holland (8,8%), Luxembourg (8,1%), Austria (7,6%), Sweden (7,5%), Lithuania (6,5%), Poland (5,7%), Czech Republic (5,5%), Slovakia (5,3%) and Slovenia (4,4%). Spain (24,9%), Malta (22,6%) and Portugal (20,8%) are those with the highest values, showing more difficulties concerning the inclusion of a young population in basic education. The average figure for Europe (27 countries) was 12,8% in 2012 (Observatório das Desigualdades, 2010; Eurostat, 2014).

Another indicator that should also be considered is the tertiary educational attainment. According to the Eurostat (2014) the figure for Portugal (27,2%) is lower than the average figure for Europe (35,8%). Actually only the countries Turkey, Slovakia, Romania, Austria, Malta, Italy, Croatia, Czech Republic and Bulgaria show worst figures. The figures presented reveal that ESL is a real problem in Europe, mostly in southern countries. Nevertheless, this problem is already been tackled and in some situations, with positive results. The InSchool project emerged both as a result of the consciousness of this problematic reality and as an opportunity to identify, share and transfer already existing good initiatives. In the following section we present the project and the initiatives identified in Portugal as well as one identified in UK and being transferred to Portugal.

3. InSchool project

The project InSchool – Innovation in Early School Leaving project (<http://inschoolproject.org/>) aims to share best practices within the partnership, to produce best practice manuals, to enable partners to observe the application of best practices through benchmarking, to involve stakeholders and to enable all partners to import and apply at least one innovative aspect of best practice. The expected tangible outcomes are 5 workshops held in each of the partner countries, 4 good practices guides, a supportive website and the identification of aspects of best practice that would be imported to each partner organization.

The partners of this project are: UK (Bury College) (Coordinator), Romania (IPA, SA S.C.), Portugal (ISCAP / IPP), Italy (E.RI.FO.) and Turkey (Nahit Mentese Girls Technical and Vocational High School). It started in October 2013 and will end in September 2015.

In order to address the objectives, an analysis of the situation of ESL in each partner country was carried out. Additionally, consortium also identified a set of good practices already taking place in their own countries. The following step was to allow each partner to select at least one of these good practices and implement it in their own organization. In the next section we describe the best practices / initiatives identified in the Portuguese partner as well as the initiative that was imported.

4. Initiatives in Portugal

The initiatives in Portugal were identified twofold:

- a) Via a survey where we asked all schools (public and private, VET and secondary) in the Porto region (where the partner is located) to share their experiences. We asked 5 questions: 1. Identification of the school, 2. Contact person, 3. Description of the initial problem, 4. Reasons for ESL and 5. Actions to reduce ESL. The rest of this section presents results obtained. These initiatives are described in sections 4.1 and 4.2.
- b) and through our own experience and initiatives already carried out in the Portuguese partner organization (see section 4.3.).

As required by the project, the Portuguese partner also had to identify an initiative developed in another project partner and implement it. This initiative is described in section 4.4.

4.1. Initial problem and reasons for ESL

According to the respondents of the survey, ESL happens mostly during the 10th grade, at the end of the 1st period or at the end of that year. For some schools ESL is not a problem anymore (rates of 2,5% which corresponds mostly to some mismatch in the courses) because it has being tackled for a

while. For some other schools, this is still a problem, with leaving rates around 20%, even if these figures already represent a decrease in the total number of school leavers.

There are several reasons for ESL. These can represent a mismatch with a course which they didn't know really before enrolment. It can also be due to the fact that sometimes students recognize that they do not have the vocation to follow those studies. Other respondents identify as reasons for ESL financial problems of the family of the student, meaning the lack of economic resources, unstructured families, emigration of families and students moving with them. Sometimes the described circumstances also forces students to integrate in the job market and look for precarious contracts. Other reasons for ESL are related with the school and the study programme. Expectations are not met with the course or with the school. Some state they "didn't like the course", are "not motivated to the course", or "prefer another school". Some also refer lack of motivation after 18, no interest for education, low expectations and lack of vision of a professional and personal future.

4.2. Initiatives identified by the survey

As referred before, in the schools that participated in the survey, ESL happens mostly in the 10th grade (1st year of secondary education). At this moment some students move from one school to another one, experiencing a new period of adaptation and learning. They meet new people and teachers, new pedagogical approaches which can represent for some students a great challenge. Furthermore, at this 10th grade, students do not really know yet what kind of studies they want to follow. And this explains the ESL rates. The respondent schools have identified this problem and decided to work the reasons that were concerned with the school and the programme of studies. Of course there are other reasons but these are beyond any possibility of the school to intervene.

Some of the initiatives developed are:

1. Education offered by study area and not by course, at the beginning of the 10th grade. This allows the student to try the possible available areas before committing to just one.

2. A systematic accompaniment of students by coordinators of the different courses which integrate each study area as well as by the direction board and office of vocational guidance and counselling with the objective to understand the best way to follow at the end of the 10th grade.

3. Promotion of the proximity between student and teacher. Teacher is seen as a tutor that supports and accompanies the student. The tutorship is a process through which students have a customized, systematic and integrated accompaniment. Its aim is to support the educational supervisor while doing the customized accompaniment, facilitate the integration of students in class and school, promote the academic and educational success of students, accompany students in the development of their study plan as well as in all the activities concerning their educational and formative process.

4. Specific projects. Ex: P1 – Solidarity project – students are involved in solidarity activities. They help others in worst situations and this contributes to a better understanding of their own situation; P2 – POEMA – psychologists and technicians work with students trying to motivate them; P3 – ALIMENTE – together with external stakeholders, the school tries to find solutions for several of the daily problems encountered by the students (medicine, pharmacy, food providers, etc.). This project tries to intervene in some of the external sources of ESL; P4 - "Vamos dar a cara pela escola" where former students give their testimonial and become partners of the school; P5 - Project "Vamos conversar com" with the format of workshops, conferences of testimonial given by professionals, with topics related with the programme of studies. In all these projects there is always a concern about employability; P6 - "Tu decides os teus rumos" to prevent drugs consumption and reach a healthy life; P7 - "Viagens na minha terra" – promote national mobility; P8 - International internship for actual and former students. The priority is that each student has at least one international experience; P8 - Project Motiva – Some dynamics are used in order to help new students to better integrate in classes and in the course; P9 - Project of Change and Pedagogical differentiation – since 2012/2013 they involved all teachers in teams and are now implementing pedagogical projects such as: Pedagogical Differentiation in classroom / Cooperative Learning / Project Methodology / Learning Dossier / Tutorship.

5. Other initiatives comprise: a) Encourage the use of the Psych Pedagogic Support Service in order to support students and parents as well as to help the structuration of the academic paths of students; b) Explain to parents the importance of school as a valuable asset for the future of their kids; c) Force a commitment of parents in the academic path of their kids, promoting their co-responsibility; d) Implement projects that promote the participation of parents in the activities in the school; e) Encourage the prevention of ESL through the promotion and effectiveness of intermediate curricular management structures (Coordinators of Courses and Class Group Educational Supervisors) and through the Psycho Pedagogic Support Service.

4.3. Other initiatives identified

Based on Social Cognitive Theory, self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance (Bandura, 1986, 1997). This concept is useful to predict human performance in several areas, although its predictive power is enhanced when specific measures of each domain of human functioning are used. Additionally, as self-efficacy is a judgment of personal capability, it is not considered a trait and it can change over time. This malleable characteristic associated with the potential for self-efficacy improvement allows the development of psychological and educational interventions based on the four sources of self-efficacy: Successful Past Performance, Observing Others' Performance, Verbal Encouragement/ Social Support and Physiological and Emotional states.

Several studies show that students' self-efficacy is related to academic achievement and/or dropout, both internationally (*e.g.* Bandura, 2006; Brown, Tramaty, Hoxha, Telander, Fan & Lent, 2008; Pajares, 2007) as well as in Portugal (*e.g.* Vieira & Polydoro, 2009; Vieira 2010).). The student self-efficacy questionnaire was validated to Portuguese context (Vieira, Polydoro, & Coimbra, 2009; Vieira, Caires & Polydoro, 2011) and it is composed of 20 items. This measure is useful to rapidly screening student's self-efficacy, though, facilitating the identification of the students at risk of poor academic performance and/or Early School Leaving (ESL). The administration of this questionnaire at the beginning of the academic year allows the identification of students with lower self-efficacy and the prevention of poor academic performance and/or ESL by the implementation of activities aimed to enhance students self-efficacy based on its sources.

4.4. Imported initiative from UK partner

During the meeting of the InSchool project in Porto, Portugal, all the partners presented some good practices already available in their organizations. The partner from the UK, Bury College, presented a website totally oriented to students and potential students. They called it "Be the Best at Bury College" and it is available at <http://bethebest.burycollege.ac.uk>. With this website they provide useful information to this specific target, namely how to go to the school, how to study, how to be involved, etc. This information in a very appealing way for young people, with lots of colour and pictures allows students and future students to identify themselves more and more with the institution and take part of the existing initiatives. A culture of belonging is in place, since students feel themselves part of the institution. ISCAP, the Portuguese partner, accepted to introduce this good practice, so a team composed by teachers, students and a website company was set up. The objective was to build a website with the same characteristics that allowed students and future students identify themselves with the ISCAP culture. This process was developed with the integrated participation of all the team. The students provided some translation of texts, and gave their opinion about the design of the website. This was particularly important as the main visitors and users of the website are supposed to be students, so the design had to be in line with their preferences. The teachers revised the translation of texts and supervised all the process of building and making the website available. The website company prepared their work according to the suggestions of teachers and students. Additionally, the website was built to be used in every browser and every device - a mobile-friendly version was considered. Although it was not easy to involve students in the beginning of the process, their feedback was very motivating for the team, as they identify themselves with the idea of the website, the way the process was conducted and even with their contributions for it.

The "Be the Best at ISCAP" website available at <http://www.livethebestatiscap.com> includes several tabs that are coincident with the website from the UK partner. In a conclusion stage of construction the website provides the following tabs: Be Involved, Be Here, Be on Board, Be Prepared. The main objectives of the ISCAP website were to provide students and future students the support they need and the motivation to be at ISCAP. These objectives are being already achieved if we consider the feedback of students' participation in the process.

5. Conclusions

Early school leaving is a real problem, more evident in some countries than in others, as is the case of Portugal. Due to its importance, EU countries have committed to reducing the average share of early school leavers to less than 10% by 2020. A report of the thematic working group on ESL was prepared in 2013, where some key policy messages identify the critical conditions for successful policies against ESL EU countries are already working to attain the established goal and some initiatives are being carried out. In this article we presented some of these, in particular those identified in the Portuguese partner within the EU project InSchool. Additionally, a tool developed to help to identify students at risk was also presented. Among the initiatives advanced by other partners, Portugal selected and imported a

website aiming to minimise the problems students face when they enter higher education. This website was developed with the help of a team where students actively participated. As for future research, the team will evaluate the efficacy of the site and information provided. Of course, schools try mostly to address those constraints related with the school, the programme of studies or pedagogy. Nevertheless, some examples involving other problems were also identified. Early school leaving is a complex problem, involving several causes and demanding a holistic solution, eventually requiring a critical revision of the entire education and training system. There is not only one solution or the perfect solution. All stakeholders need to be involved and actively contributing to minimise the problem and attain the goal established for 2020.

References

- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (Vol.5, pp.307-337). Greenwich, CT: Information Age Publishing.
- Brown, S. D., Tramayne, S., Hoxha, D., Telander, K., Fan, X. & Lent, R. (2008). Social cognitive predictors of college students' academic performance and persistence: A meta-analytic path analysis. *Journal of Vocational Behavior*, 72, 298-308.
- Eurofund (2012). NEETs - *Young people not in employment, education or training: characteristics, costs and policy responses in Europe*
<http://www.eurofound.europa.eu/pubdocs/2012/54/en/1/EF1254EN.pdf>
- European Commission (2013). *Reducing early school leaving: Key messages and policy support*. Final Report of the Thematic Working Group on Early School Leaving.
http://ec.europa.eu/education/policy/strategic-framework/doc/esl-group-report_en.pdf
- European Commission (2014a). *Early School Leaving*. http://ec.europa.eu/education/policy/school/early-school-leavers_en.htm
- European Commission (2014b). *EUROPE 2020 TARGET: Early Leavers From Education And Training*.
http://ec.europa.eu/europe2020/pdf/themes/29_early_school_leaving.pdf
- Eurostat (2013). *Early leavers from education and training by sex*.
http://epp.eurostat.ec.europa.eu/tgm/mapToolClosed.do?tab=map&init=1&plugin=1&language=en&pcode=t2020_40&toolbox=types
- Eurostat (2014). *Europe 2020 Indicators*.
http://epp.eurostat.ec.europa.eu/portal/page/portal/europe_2020_indicators/headline_indicators
- Observatório das Desigualdades (2010). *Abandono precoce de educação e formação: tendência de queda em Portugal e na Europa*. <http://observatorio-das-desigualdades.cies.iscte.pt/index.jsp?page=indicators&id=27&lang=pt>
- Pajares, F. (2007). Empirical Properties of a Scale to Assess Writing Self-Efficacy in School Contexts. *Measurement and Evaluation in Counseling and Development*, 39 (4), 239-249.
- Vieira, D. & Polydoro, S. (2009). O papel da autoeficácia no sucesso académico: Um estudo com estudantes do ensino superior. *Livro de resumos do X Congresso Internacional Galego-Português de Psicopedagogia*. Braga: Universidade do Minho, 9-11 de Setembro.
- Vieira, D. A. (2010). Autoeficácia na formação superior: Um fator protetor face ao insucesso académico? In A.S. Pereira, H. Castanheira, A.C. Melo, A.I. Ferreira e P. Vagos (Eds.), *Apoio Psicológico no Ensino Superior: modelos e práticas* (pp.355-361). Aveiro: Universidade de Aveiro/RESAPES-AP.
- Vieira, D. A., Caires, S & Polydoro, S. A. J. (2011). *Escala de autoeficácia na formação superior: Análise fatorial confirmatória* VIII Congresso Iberoamericano de Avaliação /Evaluación Psicológica e XV Conferência Internacional Avaliação Psicológica: Formas e Contextos. Lisboa: Faculdade de Psicologia da Universidade de Lisboa, 25-27 de julho.
- Vieira, D., Polydoro, S.A.J. & Coimbra, J.L. (2009). Autoeficácia na formação superior (AEFS): Estudo de validação em estudantes do ensino superior em Portugal. *Livro de resumos da XIV Conferência Internacional de Avaliação Psicológica: Formas e Contextos* (pp.63-64). Campinas, São Paulo: Universidade de São Francisco, 29-31 de Julho e 1 de Agosto.

AUDITORY ACCESS AND DISTINCTION OF VISUAL DOCUMENT ELEMENTS BY BLIND AND SIGHTED STUDENTS

Vassilios Argyropoulos¹, Georgios Sideridis², Aineias Martos³ & Magda Nikolarazi¹

¹Department of Special Education, University of Thessaly, Volos (Greece)

²Boston Children's Hospital, Harvard Medical School, Boston, MA (USA)

³Department of Informatics and Telecommunications, National and Kapodistrian University of Athens (Greece)

Abstract

There is common agreement that oral performances of the prosodic characteristics of documents, or generally speaking, of the visual document elements are accompanied by voice fluctuations according to the visual information which is embedded in the documents. The visual structure of documents emanates from data that accommodate the textual data, i.e. meta-information. Examples of utilization of the meta-information by Web Browsers in the visual domain are the effects caused by “bold” or “italic” letters, or the structured layout of tables. Nevertheless, when setting such documents in an auditory environment, the aural presentation traditionally occurs by excluding the meta-information from the source document prior to the Text-to-Speech (TtS) conversion. The aim of this research is to find out mappings between prosodic characteristics of written and oral speech via a series of complex phycho-acoustic experiments. We experimented with the auditory definition of the visual components bold and italic to acoustically render the logical styles of emphasis, strong emphasis and word definition. Thirty blind and thirty sighted students participated in psycho-acoustic experiments and were asked to distinguish controlled versions of auditory components, as well as their preferences and opinions on the quality of the selected features. Our findings indicated that the groups differed significantly - within subjects and between subjects - in terms of their auditory distinction.

Keywords: *Synthesized speech, visual document elements, severe visual impairments, auditory access*

1. Introduction

The visual structure of documents emanates from data that accommodate the textual data, i.e. meta-information. Examples of utilization of the meta-information by Web Browsers in the visual domain are the effects caused by “bold” or “italic” letters, or the structured layout of tables. Nevertheless, when setting such documents in an auditory environment, the aural presentation traditionally occurs by “taking out” the meta-information from the source document prior to the Text-to-Speech (TtS) conversion. This implies less effective presentation that would be the case if the document structure was retained. For example, the prosodic characteristic “italic” usually underpins the logical type <emphasis> or <word/phrase definition>, which is not delivered, for example, through a screen reader (Kouroupetroglou & Tsonos, 2008).

Related research efforts on the auditory representation of visual components focus on the isolation of the phoneme stream, which carries the message in TtS synthesis, from the prosodic and the audio stream that are exploited to acoustically represent other meta-information about the message. Hakulinen et al. (1999) highlighted the importance of combining speech and non-speech signals to support the presentation of visual components and structures whereas, other relevant research focused on the prosodic variations and speaker-style changes. Earcons, i.e. structured sounds constitute the aural counterparts of icons (Blattner et al., 1989), and Auditory Icons have been used in the human-machine interfaces (Gorny, 2000).

Alternative ways in approaching the above issues are the Sound Fonts. This type utilizes prosodic modifications of synthetic speech in order to deliver visual components in a speech modality. Truillet et al. (2000) studied the role of sound fonts in conjunction with issues of comprehension and memorization of the prosodic characteristic “bold”. Their research was focused on two cases: (a) insertion

of the pitch modified phrase “in bold” before the bold words and (b) pitch modification directly on the corresponding bold words. Case (b) was finally the preferred Sound Font.

In general, it seems that synthetic speech is no-time consuming procedure and has the potential to convey a lot of information of the source documents but some researchers hold the view that it does not necessarily lead to deep comprehension of a text (Edmonds & Pring, 2006). The aims of this study were (a) to draw general comments based on students’ views about their preferences on different controlled versions of auditory components, and (b) to compare blind and sighted students’ performances regarding their auditory distinction towards different controlled versions of auditory components. The results of such experiments are considered to be of interest because they may help to the direction to determine a mapping of the acoustical effect of different auditory scripts by blind and sighted participants and secondly in a long-term plan these mappings may turn to be useful in educational settings.

2. Methodology

2.1. Participants

Sixty participants took part in this study; thirty blind students and thirty sighted ones. The age range for all participants was from 20 years to 25 years. They were all students of different schools in two universities. All blind students who participated in the research had proficient braille literacy skills and according to their files had no other additional disabilities.

2.2. Experimental Design

Two visual components accompanied by specific logical styles: (a) “bold” and (b) “italic” were tested. According to the Aural Cascading Style Sheets (ACSS) the visual component “bold” was used for strong emphasis while the semiotic of the component “italic” is twofold: i. for a word being defined <DFN> and ii. for emphasis . The above visual components were selected within the frame of a research which has been conducted for all textbooks used in Greek high school in terms of the usage of one- and two-dimensional visual constructs. The chosen text for the psychoacoustic experiments was extracted from the textbook “Home economics” (high school, pp. 25-26, 255 words). The chosen extract contained four points with words being defined (italic), four points with emphasis (italic) and four points with strong emphasis (bold). It was thought not to compose a new text for the purpose of the research; instead, to use an extract from a textbook which is used in high school and approved by the Ministry of Education and the Pedagogical Institute.

Voice fluctuations were feasible through specific prosodic baselines which referred to: pitch=110Hz, speed=140 words per minute and volume=100 (i. e. Version 0; Xydias & Kouroupetroglou, 2001). The auditory specifications for the prosodic characteristics “bold” and “italic” were based on a pilot study conducted by Xydias, Argyropoulos, Karakosta and Kouroupetroglou (2005) (see Table 1).

Table 1. Auditory specifications for the prosodic characteristics “bold” and “italic”

Version	Bold 	Italic <DFN>	Italic
0	Pitch = 110 Hz	Speed = 140 wpm	Volume = 100
1	Pitch = 132 Hz (+20%)	Speed = 119 wpm (-15%)	Volume = 130 (+ 30%)
2	Pitch = 94 (-15%)	Pitch = 132 Hz (+20%)	Speed = 119 wpm (-15%)
3	Volume = 130 (+ 30%)	Pitch = 94 (-15%)	Pitch = 132 Hz (+20%)
4	Pitch = 132 Hz (+20%)	Volume = 130 (+ 30%)	Pitch = 94 (-15%)

The whole process of the experimental design was consisted of three research phases (RP).

2.2.1. RP 1: Semi-structured interviews. This part of the research was exploratory and aimed to highlight themes such as the experience of the participants in listening pre-recorded study materials, in using speech synthesis technologies and also to obtain information about their comprehension for the meaning of the prosodic components (bold & italic) when they meet them in a document. Apart from the semi-structured interviews a discussion also took place in order to clarify the purpose of the experiments, the process itself and the reasoning which underpin the usage of the selected prosodic components (bold & italic).

2.2.2. RP 2: Instructions and preliminary tasks. The researchers explained in detail about the purposes of the research to all participants. In turn, each participant was given approximately 10 minutes

to familiarize him/herself by listening to a range of eight different levels of pitch, volume and speed mapping them in a variety of a set of frequency- intensity –duration respectively.

2.2.3. RP 3: Experiments. All students should have a good audition and each of them listened to a specific aural presentation text in some versions. Each version had different qualities of sound in pitch, volume & speed (Table 1). The aural presentation text included all the prosodic components which were under the scope of this study (bold & italics). During the experiments the participants wore stereophonic headphones to isolate all external aural interferences. The process was the following: in the beginning, a rendering of the stimulus material was presented (Version 0), followed by the 4 alternate ones (Table 1). After the students have heard Version 0 subsequently were presented aurally Version 1 and in turn they were invited to identify the aurally modified words or phrases which they noticed when comparing the two versions of the same stimulus material (i. e. Versions 0 & 1 respectively). This procedure was a follow-up for the rest of the versions. The combination of Versions 1, 2, 3 & 4 was chosen randomly.

3. Results

3.1. Semi-Structured Interviews

The data obtained from the semi-structured interviews provided the information that all blind students had a lot of experience in listening pre-recorded study materials during their educational period in primary and secondary school. On the contrary, their sighted peers had very limited experience in listening educational material. All students had a good audition and could clarify a variety of natural voice fluctuations. Also all blind students were experienced in listening speech synthesizers whereas, the sighted hardly had any. The usage of a speech synthesizer by the blind students was daily but at the same time they expressed some problems they were facing which it is worth mentioning them. They held the view that the performance of a speech synthesizer – “...no matter how good the conversion is...” – becomes monotonous which actually required from them a high level of concentration which in turn left them feeling fatigued and tired sometimes with headaches and even dizziness. Nevertheless, all blind students pointed out the usefulness of speech synthesizers because as they argued “is the only way for us to have an access to wider information”.

The prosodic component “bold” was familiar to all blind students and the meaning which they have addressed to it was that of importance or emphasis while the prosodic characteristic “italic” did not mean anything to them neither as a name nor as a semantic.

Sighted students had approximately the same conceptions about the above prosodic components; they differed a little in the semantic of the prosodic font “italic”. All blind students were using braille every day (read or write), whereas their sighted colleagues knew only that braille was the written code for the blind (see Table 4).

3.2. Auditory recognition and distinction

3.2.1. Within blind students. A one-way repeated measures ANOVA was conducted to compare scores in recognizing correctly the auditory components through all versions. It was found that blind students performed more accurately in recognizing differentiated auditory components during Version 4. There was a significant effect regarding correct auditory recognition, Wilk’s Lambda = 0.373, $F(3, 27) = 15.138$, $p < .0005$. This suggested - since the p value was less than .05 - that there was a significant difference between the performances of blind students with more accurate performance in Version 4 regarding correct auditory recognition.

3.2.2. Within sighted students. Sighted students’ performances did not differ significantly. There was not significant effect regarding correct auditory recognition [Wilk’s Lambda = 0.840, $F(3, 27) = 1.719$, $p = 0.187$ which is greater than 0.5]. Such a result would entail that the means of the performances of the sighted participants in all versions did not differ significantly.

3.2.3. Between sighted and blind students. A two-way mixed between-within subjects ANOVA was conducted to explore the impact of all versions regarding correct auditory recognition by blind and sighted students. From this analysis it was found that there was a statistical significant difference at the $p < .05$ level in recognising differentiated auditory components per version between blind and sighted students. More specifically, Wilk’s Lambda = 0.63 with $p < .0005$. The effect size, calculated using eta squared was 0.37. Using the commonly used guidelines proposed by Cohen (1988) this result suggests a large effect size. Comparisons between blind and sighted students regarding the different versions (see

Table 1), revealed statistically significant differences among Versions 1, 3 & 4 [$F(1, 58) = 8.9, p=0.004 < 0.05$, $F(1, 58) = 15.59, p=0.00 < 0.05$ & $F(1, 58) = 14.34, p=0.005 < 0.00$ respectively]. The blind students' performances did not differ significantly from the group of the sighted ones when they listened Version 2 [$F(1, 58) = 8.07, p=0.217 > 0.05$]. Finally, we were interested to find out if there was a significant interaction effect over time for the two different groups through their performances. In this case the interaction effect was not statistically significant (the sig. level for Wilks' lambda was 0.07 which is greater than our alpha level 0.05).

4. Discussion and Conclusions

In general, the blind students' performances were at high level of correct auditory recognition and the fact that blind students surpassed their sighted peers might be happened due to the experience of the former in listening to a big variety of pre-recorded study materials (see 3.1 analysis of semi-structured interviews) in conjunction with speech synthesizers.

According to the above analysis blind and sighted students were more accurate when listening to the 4th version regarding correct auditory distinction. Version 4 was the only one which did not use the auditory specification <speed> for the used prosodic characteristics (bold & italic). All participants stressed out that they faced difficulties to conceptualize modifications in speed. On the contrary, they were well disposed toward modifications of pitch in conjunction with modifications of volume. These elements were embedded in Version 3 and this outcome was in agreement with the outcomes of Xydas et al. (2005). Hence, it may be argued that this outcome may lead to the formation of a generalized preferred auditory mapping in favor of the blind students. More specifically, the results may lead to the conjecture that the auditory specification <speed> neither facilitated blind nor sighted students in correct auditory recognition. Also, in addition to this many students mainly blind, underscored that they could easily recognize the ups and downs of the pitch but on the other they hardly could clarify changes in speed. All students characterised the application very interesting and useful in transferring meta-information acoustically from a document. Especially blind students expressed their frustration because of the limited information they receive so far from their speech synthesizers.

The previous inferences are of great interest because they are strongly linked with educational issues. The practical implications of auditory representations of documents may facilitate or hinder the education of blind students in schools which in turn will have a great impact on their development of literacy skills and their employment as well (Allman, 1998; Amato, 2002; Arter & Layton, 2000; Fellenius, 1999; Knowlton & Berger, 1999). However, little qualitative research has been done to document the parameters of the impact that the computers and the speech output software have on blind students' writing skills or in general on their literacy skills (Argyropoulos, Leotsakou, & Martos, 2005).

The number of this type of studies has to be increased and extended to the area of comprehension to draw reliable inferences testing in this way our hypotheses but nevertheless, the findings of this study provided a rough assessment for the determination and specific auditory behaviour of the prosodic components (bold & italic) leading to an integrated and enriched synthesized auditory recognition. These issues mentioned above should be addressed in future research to arrive at robust conclusions expanding the number of participants, testing more visual structures and investigating the degree of comprehension since we are also interested in implications in education.

Acknowledgments

This research has been co-financed by the European Union (European Social Fund – ESF) and Greek national funds through the Operational Program "Education and Lifelong Learning" of the National Strategic Reference Framework (NSRF) under the Research Funding Project: "THALIS-University of Macedonia- KAIKOS: Audio and Tactile Access to Knowledge for Individuals with Visual Impairments", MIS 380442.

References

- Allman, C. B. (1998). Braille communication skills: What teachers teach and visually impaired adults use. *Journal of Visual Impairment and Blindness*, 92(5), 331-338.
- Amato, S. (2002). Standards for competence in Braille literacy skills in teacher preparation programs. *Journal of Visual Impairment and Blindness*, 96(3), 143-154.

- Argyropoulos, V., Leotsakou, B., & Martos, A. (2005). Blind students and spelling: An Investigation into braille literacy skills. In *Proceedings of the ICEVI European Conference 2005 on Education – aiming for Excellence* (pp. 180-185). Chemnitz: Germany.
- Arter, C., & Layton, L. (2000). Reading Preferences of Pupils with Visual Impairment. *British journal of Visual Impairment*, 18(1), 41-44.
- Blattner, M. M., Sumikawa, D. A., & Greenberg, R. M. (1989). Earcons and Icons: Their Structure and Common Design Principles. *Human Computer Interaction*, 4, 11-14.
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*, (2nd ed.). New Jersey: Lawrence Erlbaum.
- Edmonds, C. J., & Pring, L. (2006). Generating inferences from written and spoken language: A comparison of children with visual impairment and children with sight. *British Journal of Developmental Psychology*, 24, 337–351.
- Fellenius, K. (1999). Computer-based instruction for young braille readers in mainstream education – an evaluation study. *Visual Impairment Research*, 1(3), 147-164.
- Gorny, P. (2000). Typographic semantics of Webpages Accessible for Visual Impaired Users, Mapping Layout and Interaction Objects to an Auditory Interaction Space. In *Proceedings of the 7th International Conference on Computer Helping with Special Needs* (pp. 17-21). Karlsruhe: Germany.
- Hakulinen, J., Turunen, M., & Raiha, K. (1999). The Use of Prosodic Features to Help Users Extract Information from Structured Elements in Spoken Dialogue Systems. In *Proceedings of ESCA Tutorial and Research Workshop on Dialogue and Prosody* (pp. 65-70). Eindhoven: Netherlands.
- Knowlton, M., & Berger, K. (1999). Competencies required of Braille teachers. *Re:View*, 30(4), 151-160.
- Kouroupetroglou, G., & Tsonos, D. (2008). Multimodal Accessibility of Documents. In: Shane Pinder (Ed.), *Advances in Human-Computer Interaction, I-Tech Education and Publishing* (pp. 451-470). Vienna.
- Truillet, P., Oriola, B., Nespoulous, J. L., & Vigoroux, N. (2000). Effect of Sound Fonts in an Aural Presentation. In *Proceedings of the 6th ERCIM Workshop, UI4ALL* (pp. 135-144). Florence: Italy.
- Xydas, G., & Kouroupetroglou, G. (2001). The DEMOSTHeNES Speech Composer. In *Proceedings of the 4th ISCA Tutorial and Workshop on Speech Synthesis (SSW4)* (pp. 167-172). Perthshire: Scotland.
- Xydas, G., Argyropoulos, V., Karakosta, T., & Kouroupetroglou, G. (2005). An Experimental Approach in Recognizing Synthesized Auditory Components in a Non-Visual Interaction with Documents. In *Proceedings of the 11th International Conference on Human-Computer Interaction*, 3, 411-420.

HAPTIC RECOGNITION OF TWO-DIMENSIONAL TACTILE PATTERNS OF BASIC GEOMETRIC SHAPES BY INDIVIDUALS WITH VISUAL IMPAIRMENTS

Vassilios Argyropoulos¹, Maria Papazafiri¹, Sofia-Marina Koutsogiorgou²,
Magda Nikolarazi¹ & Eleni Katsiafourou¹

¹*Department of Special Education, University of Thessaly (Greece)*

²*Technical and Vocational School of Special Education, Ministry of Education and Religious Affairs (Greece)*

Abstract

The access to information for individuals with visual impairments occurs primarily through the sense of touch. It is a multifactor process which gives a complex character in haptic perception (movement, posture, frame of reference, language issues, prior knowledge). In this pilot study six individuals with visual impairments were invited to compare two different production methods of two-dimensional tactile patterns recognizing seven basic geometric shapes. This recognition was based on two variables: (a) shape recognition, and (b) time recognition. The first method was the stereo-copying one and the second one was the winbraille software application in conjunction with an index embosser. The results indicated that the stereo-copying method was the most efficient because it evoked more accurate recognition in shorter time lengths. Also the findings of this study highlighted the importance of applying appropriate methods regarding the production of tactile patterns enabling individuals with blindness to “grasp” the whole picture of a shape. It is suggested to conduct similar studies increasing the size of the sample including students with visual disability in order to shape a more integrated protocol of active exploration and recognition and correlate their components to levels of understanding.

Keywords: *Haptic recognition, active touch, geometric shapes, visual impairments*

1. Introduction

The access to information for individuals with visual impairments occurs primarily through the sense of touch. It is a multifactor process which gives a complex character in haptic perception (movement, posture, frame of reference, language issues, prior knowledge) (Argyropoulos, 2002). Particularly, when the tactile material concerns embossed diagrams the production method should be taken into account as an additional factor. Tactile diagrams provide spatial information (Jehoel, Sowden, & Sterr, 2009). There are two main methods for their production: (a) the stereo-copying method which produces tactile materials using microcapsular or “swell paper” and a heat fuser, and (b) the use of braille printers (or embossers) with compatible software in producing embossed diagrams with a variety of levels of dot-height (Jehoel, McCallum, Rowell, & Ungar, 2006). It would be an omission not to mention the vacuum forming method which uses a special machine (i. e. a thermoform) (Mason & Arter, 1997) but it is out of scope of the present study.

In the stereo-copying method a special paper is used, the capsule or swell paper. Users can draw, print or photocopy pictures onto the swell paper and run it through the stereo-copying device (a heat fuser). In turn, the heat of the stereo-copying device causes all the black areas to raise or to “swell” and then the produced tactile image can be recognized by touch. The material which is produced by the stereo-copying method (paper with microcapsules) is a relatively new method which was developed in Japan in 1980 (Aldrich & Parkin, 1987) and it is referred variously as “capsule paper”, “paper from bubbles” or “embossed paper.” Also, it seems that this material is well accepted among the users who are blind because of its absorbent properties which produce smooth texture (Aldrich & Parkin, 1987) with or without braille (Mason & Arter, 1997).

The second method involves a combination between embossers and software applications. One common and well known software application is Winbraille. WinBraille is a powerful, fully Windows based Braille editor for Windows, exclusively for Index embossers. Images in Microsoft Word documents

can be translated to tactile pictures and included in the Braille text. Nevertheless, in order to produce an eligible tactile image or diagram through Winbraille the original image has to be a simple line drawing, as the analysis of this method is not very accurate. In a nutshell, this software application allows the user apart from converting computer documents to literary or contracted braille (Niyomphol, Tandayya, & Nantachai pitak, 2008), it also converts ordinary digital pictures into tactile form with braille dots.

Relevant research has posted a series of discussions about the suitability of the method in producing tactile forms. Many of the problems linked to tactile presentations concern haptics. In the broadest sense, "haptics is the study of touch" (Ostad, 1989). Some researchers hold the view that similarity between visual and tactile representations do not in themselves conflict and the design of visual pictures could also be reflected to a large degree in the design of tactile representation. For example Jesensky (cited by Ostad, 1989) stresses that the optimal typhlographic representations are comparable to normal projection and he points out that the best way to design tactile representations is to follow visual procedures. Klatzky, Lederman and Reed (1987) have a different viewpoint based on a model called "direct haptic apprehension". In this model haptics is seen as a multidimensional system which operates on several distinct categories of information. The supporters of this model are strongly critical of the development of tactile representations which are simply adaptations of visual representations (Klatzky, Lederman, & Reed, 1987).

The focus now is placed on the users' needs and abilities which have to be assessed in advance in order to convert visual images into eligible tactile forms. At this point it is worth noting that there is an on-going disagreement between those who support that individuals with blindness can make sense of realistic haptic two-dimensional images (D'Angiulli, Kennedy, & Helle, 1998) while others hold the view that it is extremely difficult to recognize two-dimensional images through touch (Lederman & Klatzky, 1987).

The main objective of this study was to investigate which one of the above two methods of producing tactile patterns was most effective for individuals with blindness to recognize basic geometric shapes. Specifically the research questions were the following:

1. Which one of the above two methods of producing tactile patterns entails more difficulties for individuals with visual impairments in recognizing two-dimensional geometric shapes?
2. Which one of the above two methods of producing tactile patterns takes more time in recognizing two-dimensional geometric shapes by individuals with visual impairments?

2. Methodology

2.1. Participants

Six students with blindness participated in haptic tests. All participants had a visual acuity of no better than light perception, they were students in higher education and they had no additional diagnosed disabilities.

2.2. Stimulus Material

In total, seven two-dimensional shapes were used in the present study, such as triangle, rectangle, square, rhombus, hexagon, parallelogram, and circle. These seven shapes were rendered in tactile formats by two different methods. The stereo-copying method was the first one (from this point onward referred to simply as "swell-form graphics" or "SFG") and the second one was the Winbraille software application in conjunction with an index embosser (from this point onward referred to simply as "winbraille graphics" or "WBG"). In essence, the outlines of the shapes were embossed by different means. Hence there were in total 14 shapes; 7 swell-form graphic shapes with an embossed outline (a continuous concrete raised line) and 7 Winbraille tactile graphic shapes having only their outline embossed (a continuous non-concrete dotted line).

2.3. Research Procedure

Initially, the participants were informed by the researchers that this investigation dealt with the recognition of 2-D geometric shapes and were asked to describe some properties of them. Also, they were informed that there was no right or wrong answer and they would not be given feedback. Additionally, the participants were informed that the whole process would be video-recorded and that the camera shot would focus only on their hands. Two research phases took place; during the first one the researchers administered all the SFGs and after one month (the second phase) the participants were invited to explore the WBGs.

3. Results

3.1. Participants' Preferences in Shape Recognition

As described in the methodology section the core shapes were seven and they were duplicated two times each in a different texture format. Hence, there were 2 triangles, 2 parallelograms, 2 rectangles, 2 squares, 2 hexagons, 2 rhombuses and 2 circles.

Most of the participants stated that the SFG shapes were easier to recognize. In specific, participants A and B showed preference for all SFG shapes compared to the WBG ones. They characterized the SFG shapes as “clear shapes”, whereas they termed the WBG shapes as “thick shapes” or “kind of...shapes” because of their dotted outlines. Participant C stated that the WBG shapes are “kind of tricky” shapes underscoring the confusion that might be created through the dotted outlines of these shapes. He highlighted the superiority of the SFG shapes especially in the identification of the type of angles of a shape. He also commented that the smoothness of the lines on the swell paper helped him to recognize the whole shape. Participants D and F stated that the WBG shapes were the ones which helped them very much to recognize the identity of the shapes because the haptic stimulus they received from their embossed perimeter was intense compared to the stimulus that the SFG shapes evoked. Finally, participant E found all types of shapes very helpful to understand and recognize without stating any preference.

In total, it seemed that the participants found the SFG shapes more recognizable compared to the WBG shapes.

3.2. Real Time Shape Recognition

The second research question refers to the amount of time required by the participants to recognize the shape. The last two lines of Table 1 indicates that it took less time for the participants to describe and find out the identity of the SFG compared to the type of the WBG shapes. The minimum amount of time in recognition was for the SFG rectangle and hexagon (2 seconds respectively) and the maximum amount of time in recognition was for the WBG circle (128 seconds). In total, the recognition time length for the SFG shapes was 29.7% less that the recognition time length for the WBG shapes.

Table 1. Recognition time lengths for all SFG and WBG shapes

			Geometric Shapes					
			Triangle	Square	Circle	Hexagon	Rectangle	Rhombus
			t _(sec)	t _(sec)	t _(sec)	t _(sec)	t _(sec)	t _(sec)
P A R T I C I P A N T S	A	SFG	9	7	3	11	7	9
		WBG	15	7	7	11	14	14
	B	SFG	5	11	5	8	23	9
		WBG	7	4	6	12	10	10
	C	SFG	23	14	18	19	71	8
		WBG	12	52	128	36	49	22
	D	SFG	10	15	6	20	10	11
		WBG	40	9	49	29	24	39
	E	SFG	21	8	25	24	8	9
		WBG	13	7	15	22	21	16
	F	SFG	2	15	8	2	2	5
		WBG	5	10	19	13	4	4
Total time per shape		SFG	70	70	65	84	191	51
		WBG	92	89	224	123	122	105
Total time		SFG	531 seconds					
Total time		WBG	755 seconds					

4. Discussion and Conclusions

In this pilot study individuals with visual impairments were invited to compare two different production methods of two-dimensional tactile patterns of geometric shapes. In essence, this recognition was based on two variables: (a) shape recognition, and (b) time recognition. The results indicated that the stereo-copying method (SFG shapes) was the most efficient because it evoked more accurate recognition in shorter time lengths. At this point it should be noted that according to relevant literature,

two-dimensional patterns are an interesting type of tactile renderings because through them it is feasible to check whether the difficulties – if any- that individuals with visual impairments may face during shape recognition are related to the tactile spatial configuration per se (Picard, Lebaz, Jouffrais, & Monnier, 2010).

The participants recognized easier shapes that were depicted in microcapsules paper (SFG), because it seemed that the nature of this paper enabled the participants to use effectively their fingers as starting or reference point of measurements. It was conjectured from the video-recordings that when the participants were exploring SFG shapes they were using the index finger of one hand as a reference point and they continued following the contour using the index and the middle finger of the other hand. Similar outcomes can be found in relevant studies (Argyropoulos, 2002; Argyropoulos, Chamonikolaou, & Nikolarazi, 2013; Ballesteros & Heller, 1989; Heller, 1989; Lederman & Klatzky, 1987; Way & Barner, 1997; Withagen, Kappers, Vervloed, Knoors, & Verhoeven, 2011).

Also, it is worth noting that there has been conducted very specialized research about different braille dot heights allowing users to customize their graphs to better suit their unique needs (Jehoel, McCallum, Rowell, & Ungar, 2006). Also similar research has been done investigating the most efficient material/texture of tactile maps (Nagel & Coulson, 1990). With regards to the limitations of the present study, they are primarily identified in the small sample of the participants – and for this reason no statistical analysis was made - and secondly in the accuracy of the WBG shapes through the index embosser. Hence, the same experiments may be conducted via another printer (such as a Tiger printer) to a wider population enhancing validity and reliability.

To conclude, according to Mason and Arter (1997), it is wise before producing tactile materials for individuals who are blind - especially for students with visual impairments - to consider the following questions because of the presence of intra-personal differences and past experience:

- What experience has the user had in the use of tactile representation?
- What information is the student meant to gain from the diagram or graph?
- Can the same information be provided in a simpler form? (p. 172).

Acknowledgments

This research has been co-financed by the European Union (European Social Fund – ESF) and Greek national funds through the Operational Program "Education and Lifelong Learning" of the National Strategic Reference Framework (NSRF) under the Research Funding Project: "THALIS-University of Macedonia- KAIKOS: Audio and Tactile Access to Knowledge for Individuals with Visual Impairments", MIS 380442.

References

- Aldrich, F. K., & Parkin, A. J. (1987). Tangible line graphs: an experimental investigation of three formats using capsule paper. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 29(3), 301-309.
- Argyropoulos, V. (2002). Tactual shape perception in relation to the understanding of geometrical concepts by blind students. *British Journal of Visual Impairment*, 20, 7-16.
- Argyropoulos, V., Chamonikolaou, C., & Nikolarazi, M. (2013). Investigating types of active touch in individuals with visual disability during the exploration of geometrical shapes. In *Proceedings, the 6th International Conference of Education, Research and Innovation* (pp. 1626-1632). Seville Spain.
- Ballesteros, S., & Heller, M. A. (2008). Haptic object identification. In M. Grunwald (Ed.), *Human haptic perception: Psychological aspects*, 3, (pp. 207-222).
- D'Angiulli, A., Kennedy, J. M. & Heller, M. A. Blind children recognizing tactile pictures respond like sighted children given guidance in exploration. *Scandinavian Journal of Psychology*, 39(3), 187-190.
- Heller, M. A. (1989). Picture and pattern perception in the sighted and the blind: the advantage of the late blind. *Perception*, 18(3), 379-389.
- Jehoel, S., D. McCallum, D., Rowell, J., & Ungar, S. (2006). An empirical approach on the design of tactile maps and diagrams: The cognitive tactualization approach. *British Journal of Visual Impairment*, 24(2), 67-75.

- Jehoel, S., Sowden, P. T., Ungar, S., & Sterr, A. (2009). Tactile elevation perception in blind and sighted participants and its implications for tactile map creation. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 51(2), 208-223.
- Klatzky, R. L., Lederman, S. J., & Reed, C. (1987). There's more to touch than meets the eye: The salience of object attributes for haptics with and without vision. *Journal of Experimental Psychology: General*, 116, 356-359.
- Lederman, S. J., & Klatzky, R. L. (1987). Hand movements: A window into haptic object recognition. *Cognitive psychology*, 19(3), 342-368.
- Mason, H., & Arter, C. (1997). The preparation of the embossed diagrams. In H. Mason & S. McCall (Eds.), *Visual Impairment. Access to Education for Children and Young People* (pp. 171-186). London: David Fulton Publishers.
- Nagel, D. L., & Coulson, M. R. (1990). Tactual mobility maps a comparative study. *Cartographica: The International Journal for Geographic Information and Geovisualization*, 27(2), 47-63.
- Niyomphol, W., Tandayya, P., & Nantachaipitak, W. (2008). A simple text-based method of producing math/science symbols or musical notes for use in a Thai/English Braille translation software. In *Proceeding, Int. Conf. Rehabilitation Engineering and Assistive Technology* (pp. 153-158). Singapore.
- Ostad, S. A. (1989). *Mathematics through fingertips: basic mathematics for the blind pupil: Development and empirical testing of tactile representations*. Oslo: The Norwegian Institute of Special Education.
- Picard, D., Lebaz, S., Jouffrais, C., & Monnier, C. (2010). Haptic recognition of two-dimensional raised-line patterns by early-blind, late-blind, and blindfolded sighted adults. *Perception*, 39, 224-235.
- Way, T. P., & Barner, K. E. (1997). Automatic visual to tactile translation. i. human factors, access methods and image manipulation. *Rehabilitation Engineering, IEEE Transactions*, 5(1), 81-94.
- Withagen, A., Kappers, A., Vervloed, M., Knoors, H., & Verhoeven, L. (2011). Haptic object matching by blind and sighted adults and children. *Acta Psychologica*, 139, 261-271.

SPEECH AND LANGUAGE SOFTWARE IN THE INTERVENTION OF AUTISM SPECTRUM DISORDER RELATED ORAL MOTOR ABILITIES

Kateřina Vitásková & Alena Říhová

Institute of Special Education Studies, Palacký University/Olomouc (Czech Republic)

Abstract

Aim and objectives: The conducted partial research focused on the analysis of speech (oral) motor abilities of children with autism spectrum disorder (ASD) using the technology of special speech and language therapy (SLT) software programme. The relations to dyspraxia problems in children with ASD, as well as the developmental and early educational correlations with the development of speech, and early speech vocalization including complex motor difficulties, are mentioned. The grounds for this partial research stemmed from our wider focus on the assessment of pragmatic language level, which is one of the most deficient areas in persons with ASD, since the ability of facial expression gestures represents one of the most important part of pragmatic, nonverbal communication activities. **Methodology:** We mapped the oral motor abilities of children with ASD in the initial and final stages of the examination. For this purpose, we applied a special unit of the software programme FONO 2, a multimedia programme intended for individuals with impaired communication ability. For observing the outcomes on a child, we used the observational numerical scale evaluation followed by comparison of the inter-stage differences within longitudinal observation. **Conclusions:** The results show that it is possible to achieve positive outcomes by applying a systematic SLT approach based on using the SLT software in the intervention focused on the development of the oral-motor activities in children with ASD. We put forward a discussion on the possible exploitation of the results for assessment in the sphere SLT intervention.

Keywords: *Autism spectrum disorder, oral motor praxis, speech and language therapy, assessment, technology*

1. Introduction

For diagnostic as well as therapeutic activities, modern speech and language therapy (SLT) makes use of not only a variety of equipment but also technology comprising specifically designed software applications. The latter enables strengthening or even direct compensation of limited or deformed information coming from sensory-perceptual organs, which, otherwise, results in insufficient feedback about an activity conducted by the client (Vitásková, 2013). Better feedback from the performed motor activities, including oral motor activities, is then ensured, above all, by means of visualisation. The substance of this influence is a reciprocal connection between the skills to recognize (gnosis) and the skills to carry out purposeful movements (praxis) or, at qualitative level, between perception and motor activity. Among the motor activities we can include also activities associated with speech production, non-verbal communication and co-verbal behaviour. The non-verbal component of communication that is, for the most part, formed by facial expressions, gesticulation and prosody, is the very basis of pragmatic value of communication, i.e. for functional use of speech in every-day social contact. It forms the so-called communication competence that crucially determines understanding the contents of information conveyed by the surroundings of the speaker because it can complement, alter or even negate the formal component of the message (Vitásková & Říhová, 2013). In addition and in relation to the education process, it is necessary to highlight that according to Samfira, & Fărăgău-Dragos (2014), the majority of school communication is conducted by means of non-verbal communication. It is, therefore, necessary to regard the possible deviations, which can be primarily caused also by the differences in oral motor activities, as significant. They can cause false understanding of the communication behaviour of a pupil whose form of spoken utterance can differ significantly from his/her communication intention or intended contents of the utterance. This can, however, be caused by the inability, or limited ability, to produce or adequately flexibly and functionally adapt the pragmatic components of communication, based on disordered oral motor movements.

Oral motor movements are enabled by the neuromuscular set up of the oral-facial system. Autism spectrum disorders, within the context of oral motor movements, comprise many inhibiting factors, such as more frequent comorbidity with dyspraxia or apraxia, which represent reduced or totally absent skills to produce targeted, learned and accurate movements, which can be connected both with non-disturbed and, on the contrary, with a priori definitive gnosis (Belmonte et al., 2013; Dewey, Cantell, Crawford, 2007; Mitchell et al., 2006). The substance of the disturbance is also problematic imitation of movements or their performance based on exposed verbal instructions. Oral motor skills and, consequently acquired and mastered skills, are the predictors of speech ontogenesis and, naturally, determine the development and quality of communication skills.

As autism spectrum disorders are, a priori, disorders of communication, we consider a speech and language therapist (SLT) as a key member of an interdisciplinary or transdisciplinary team interested in the diagnosis and complex intervention of clients with ASD (more, e.g. Vitásková & Řihová, 2012). The objective of this paper is to draw attention to the possibilities of application of a special speech-therapeutic software programme utilized originally for different types of diagnoses associated with communication disorders, in speech-therapeutic diagnosis determination and in the intervention of individuals with autism spectrum disorder.

2. Methodology design and objectives

The principal objective of the research investigation was to analyse the oral motor skills in selected clients with autism spectrum disorder, divided into the following two partial goals:

- To assess oral motor skills in children with ASD in the initial and final phases of the investigation by means of the software programme FONO 2, unit Warm-up, and by the created evaluation numerical scale
- To compare the differences in the results between the initial phase of the oral motor activities in children with ASD and the respective final conditions.

The principal, as well as the partial objectives, were shaped as three major research questions:

- What is the condition of the oral motor skills in children with ASD in the initial phase of the investigation?
- What is the condition of the oral motor skills in children with ASD in the final phase of the investigation?
- Are there differences in the oral motor skills evaluation in the initial and final phases of the investigation?

The fundamental research tool was the speech-therapeutic multimedia programme software FONO 2, which was originally designed for the diagnosis and therapy of people with disturbed communication skills. It comprises of 5 basic types of exercises – sections Warm-up, Associations, Phonemic hearing, Reading and repeating dactyl signs (Čo je Fono, 2014). For the purposes of this partial investigation focused on oral motor skills in the monitored people with ASD, we selected a team called Warm-up with 37 activities. For the research activities, we selected 13 tasks and adjusted the recommended utilization of the programme. Our selection included the following isolated and sequential oral motor, or oral-facial, activities: 1. Smile but do not show your teeth. 2. Smile and show your teeth. 3. Pout your lips. 4. Bite your lower lip. 5. Bite your upper lip. 6. Open and close your mouth. 7. Move your jaw left and right. 8. Chomp. 9. Whistle. 10. Try to imitate chewing. 11. Blow into your cheeks and do puuuu... 12. Stick out your tongue between upper and lower teeth, keep it straight and stretch at the tip. 13. Touch the middle of your upper lip with your tongue. The personal motor activity of a client is accompanied and supported by the programme by presenting a visual model (a face performing the required movement appears on the screen), which provides the client with ASD visual facilitation of the movement imitation. Accompanying is also verbal instruction (recorded human voice specifying the movement) and the final option, very important in our opinion, comprising visual feedback in the form of the performed motor activity of the client visually compared with the example demonstration (on the right part of the screen). It is also possible to record the movement for more detailed analysis. The main method applied was longitudinal extrospective monitoring conducted between March and June 2014. The monitored areas were determined and the evaluation items, accompanied by graphical visualisation produced by the applied software, were conceived. The evaluation scale was divided into three main areas shown in Table 1.

Table 1. Evaluation scale for assessment of oral motor movements within the programme “Warm-up” for clients with ASD

Initiation of the activity	Assistance	Accuracy of performance of the given exercise
0 – does not initiate the activity	0 – requires full assistance in performing the activity	0 – performs the exercise completely wrong
1 – initiates the activity following our assistance	1 – requires partial assistance in performing the activity	1 – performs the exercise wrongly but after our correction, he/she is able to perform the exercise correctly, at least partially
2 – initiates the activity after verbal request	2 – does not require any assistance in performing the activity	2 – performs the exercise wrongly but after our correction, he/she is able to perform the exercise completely and correctly
3 – initiates the activity himself/herself		3 – performs the exercise completely and correctly

In the successive steps, we conducted evaluation of the initial and final phases of the SLT, using the above-mentioned software in three clients with ASD at infant or adolescent age. The SLT had to be, in order to maintain the principles of beneficence (see Vitásková, 2013), interlinked also with further complex development of the clients.

3. Results

For the purpose of this paper, we present an example of the changing oral motor conditions in a girl M. At the time of investigation, Marie was 6 years old; she was diagnosed with atypical autism with slight mental retardation. Within the time span between 27. 3. 2014 and 5. 6. 2014, 11 speech therapies were conducted applying the above-stated unit “Warm-up” of the FONO 2 programme. Other areas of focus of the SLT included gross and fine motor skills, comprehension, active and passive vocabulary and the practice of social situations comprising non-verbal communication. Visualisation was accompanied by an analysis and ended with comparing the monitored areas within the given time span (see Table 2). We observed whether there are, in the monitored activities and within the given time span, positive or negative changes or stagnation. We also focused on tasks that showed significant positive changes as well as on tasks that were more demanding and challenging.

Table 2. Evaluated areas of the monitored activities and corresponding numeric scales with results

Date: 27. 3. 2014					Date: 5. 6. 2014				
Activity	Initialisation	Assistance	Accuracy		Activity	Initialisation	Assistance	Accuracy	
1	2	1	2		1	1	2	2	
2	2	1	2		2	2	2	3	
3	1	1	1		3	2	1	2	
4	2	1	2		4	2	2	2	
5	2	1	2		5	3	2	3	
6	2	2	1		6	3	1	2	
7	0	0	1		7	1	0	2	
8	3	2	2		8	3	2	2	
9	0	0	0		9	1	1	1	
10	2	2	2		10	3	2	2	
11	0	0	1		11	1	0	1	
12	0	0	0		12	0	0	0	
13	0	0	0		13	1	1	1	
Stagnation				Σ	N= 16 (41.03 %) [I=4, D=6, S=6]				
Positive change					N= 21 (53.85 %) [I=8, D=6, S=7]				
Negative change					N= 2 (5.13 %) [I=1, D=1, S=0]				

From the results presented in Table 1, it follows that positive change occurred in 21 monitored activities within 13 given tasks. The working majority of tasks (53.58 %) showed a positive change in the field of initialization (N=8), assistance (N=6) as well as accuracy of the performed motor task (N=7). In all instances, this was a shift upwards by one evaluating scale – e.g. in activities No. 3 “Pout your lips”, activity No. 5 “Bite your upper lip” and activity No. 10 “Try to imitate chewing”. Further, also in the field of assistance with the given activity in activity No. 1 “Smile but do not show your teeth”, activity No. 4

“Bite your lower lip” and activity No. 9 “Whistle”. Positive changes were also apparent in the accuracy of performing individual activities, e.g. task No. 2 “Smile and show your teeth”, No. 6 “Open and close your mouth” and task No. 13 “Touch the middle of your upper lip with your tongue”.

Less frequent in the evaluation result, implying stagnation of the skills, with 41.03 % (N=16) included activities such as initiating activities No. 2, 4 and 12, assistance in activities No. 3, 7 and 8, and performance accuracy in activities No. 1, 8 and 10; we did not record in the final evaluation any positive changes when compared with the initiation phase of the evaluation. Negative changes acquired the lowest percentage 5.13 % (N=2) in terms of quality of evaluated activities, which was recorded in two instances - activity No. 1 “Smile but do not show your teeth” in its initialization and activity No. 6 “Open and close your mouth” in its assistance (2→1).

4. Discussion

From the comparison results above it can be inferred that the conducted intervention targeted on the development of oral motor activities brought positive outcomes, which is especially reflected in the prevalence of positive results (53.85 %) over the negative (5.13 %). The presented result must be perceived as being very good, especially in activities that involve sequence of movements. This is particularly true of the activity “Smile but do not show your teeth” and “Touch the middle of your upper lip with your tongue”. These activities are, in their entirety, rather difficult and in persons with ASD this aspect is even more pronounced, which primarily means that persons with ASD have difficulties with serializing and sequencing. The value representing stagnation of the child’s skills (41.03 %) also showed significant frequency, which indicates that the results cannot be 100% positive in such a relatively short span.

The research investigation is, naturally, also limited and influenced by factors determining the course of the investigation. These are, above all, momentary physical and mental conditions of the child, and the impact of external environment (such as noise, heat or, on the contrary, cold). With respect to the weight of the diagnosis and significant deficiencies not only in communication skills, it is also not possible to consider the length of the research investigation (4 months) as sufficient for recording important results and, above all, to speak about possible stability of the positive results. Despite the mentioned circumstances and limitations, we attempted at creating favourable conditions for materialization of the given investigation.

5. Conclusions

In conclusion, we can state that according to the oral motor skills analysis carried out on a client with ASD by means of the speech-therapeutic software programme FONO 2, its partial section Warm-up and our own evaluating scale, it is obvious that it is possible, through systematic SLT intervention focused on the development of mobility in the oral facial area, to achieve positive results. It is, naturally, not possible to generalize these results. That is why it would be suitable to carry out further, more detailed and longitudinal investigation in this area. Further monitoring shall be oriented on the application of the acquired findings on oral facial sensitivity on the one hand and in the diagnosis of pragmatic aspects in communication in relation to facial expressions on the other. We believe that one of the neglected areas that should be involved in diagnosis of pragmatic communication skills of clients with ASD is oral motor skill. The influence of oral motor skills of children with ASD on the quality of their production and perception of pragmatic representatives of communication should be examined from a specific SLT point of view, which is able to synthesize both contentual as well as the formal aspects of speech (compare Vitásková & Říhová, 2012). The resulting findings will serve making the SLT diagnosis and intervention in clients with ASD more effective and also in increasing the quality of the education process that is, for the most part, conducted, evaluated and controlled by means of communication processes.

Acknowledgements

The results constitute partial results of the specific research *Research in the Sphere of Communication Specifics in Selected Groups of Individuals with Communication Ability and Deficiencies or Disorders* (IGA_PdF_2014016), *Pragmatic language level in individuals with autism spectrum disorders*, supported by the Czech Science Fund of the Czech Republic (GA14-31457S), and *Research on selected communication disorders and deviations focusing on the specifics of speech therapy and hearing impairment assessment and intervention* (IGA_PdF_2015_024).

References

- Belmonte, M. K., Saxena-Chandhok, T., Cherian, R., Muneer, R., George, L., & Karanth, P. (2013). Oral motor deficits in speech-impaired children with autism. *Frontiers In Integrative Neuroscience*, 71. doi:10.3389/fnint.2013.00047
- Dewey, D., Cantell, M., & Crawford, S. (2007). Motor and gestural performance in children with autism spectrum disorders, developmental coordination disorder, and/or attention deficit hyperactivity disorder. *Journal of International Neuropsychology Society*, 13(2), 246-56.
- Fabbri-Destro, M., Gizzonio, V., & Avanzini, P. (2013). Autism, motor dysfunctions and mirror mechanism. *Clinical Neuropsychiatry*, 10, 177–187.
- Mitchell, S., Brian, J., Zwaigenbaum, L., Roberts, W., Szatmari, P., Smith, I., Beson, S. (2006). Early language and communication development of infants later diagnosed with autism spectrum disorder. *Journal of Developmental and Behavioral Pediatrics*. 27(2 Suppl), 69-78.
- Samfira, M., & Fărăgău-Dragos, M. (2014). Role of nonverbal behaviour in didactic communication. *Research Journal Of Agricultural Science*, 46(2), 191-196.
- Vitásková, K. (2013). *Special Education of Individuals with Communication Disorders*. Olomouc: Univerzita Palackého v Olomouci.
- Vitásková, K., & Říhová, A. (2012). The Current Role of Speech-Language Therapists in the Diagnosis and Complex Intervention in Children with Autism Spectrum Disorder in the Czech Republic. *Procedia – Social and Behavioral Sciences*. 69(24), 1973-1982. doi:10.1016/j.sbspro.2012.12.153
- Vitásková, K., & Říhová, A. (2013). Analysis of impaired nonverbal communication in people with autism spectrum disorders. *Social Welfare Interdisciplinary Approach*, 3(2), 87-97.
- Vitásková, K., & Říhová, A. (2014). Speech and language therapists and their role in the diagnostics of pragmatic language level in people with autism spectrum disorders. Eds. Maierova, E., Prochazka, R., Dolejs, M. & et al. *Czech-Slovak Psychology Conference (not only) for and about PhD Students*. Olomouc: Univerzita Palackého. Univerzita Palackého. 84-92.

DOES PRIMARY SCHOOL TEACHERS' AGE IMPACT ON E-LEARNING?

Lung-Hsing Kuo¹ & Hung-Jen Yang²

¹Center for General Education, National Kaohsiung Normal University (Taiwan, R. O. C.)

²Dep. of Industrial Technology Education, National Kaohsiung Normal University (Taiwan, R. O. C)

Abstract

Distance education provides one means of integrating technology across teacher preparation to meet the growing needs of pre-service and in-service preparation programs. Today, teachers can spend their time to study variety of in-service advancement education courses online. This study aims to determine whether primary school teacher's age impact on e-learning and to find structure base on profile (age group and course content) of in-service primary school teachers studied online related courses of in-service teacher advancement education in Taiwan. We use Nationwide Teacher in-service Advancement Education Information Web database by the M.O.E. and randomly select 2001 sample resources out of 21,456. The sample size is calculated with 95% confidence level and confidence interval radius of 2.09 percentage points. The study found primary school teachers using e-learning does not depends on age or course content. Also it shows the research subjects can be classified into 7 groups. There is no particular group that the primary school teachers spent more or less time using e-learning to study in-service teacher advancement education.

Keywords: *in-service education, e-learning, primary school teacher, professional development, cluster*

1. Introduction

Today's classroom teachers must be prepared to provide technology-supported learning opportunities for their students. The reason is time, quick changes and the necessity of lifelong education. Teachers are professionals should change with the environment, enhance their professional abilities and to give students a better quality of education. Being prepared to use technology and knowing how that technology can support student learning must become integral skills in every teacher's professional repertoire. The Education Information Network in the European Union (EURYDICE) defines in-service training as 'a variety of activities and practices in which teachers become involved in order to broaden their knowledge, improve their skills and assess and develop their professional approach'(Perron, 1991). It is a key factor in influencing the professional development of teachers and contributing to the improvement of their knowledge through an active role (Saiti & Saitis, 2006).

Teachers not only do teaching, sometimes they need to support administrative affairs such as regulation propaganda from the government. According to the Chapter 17, Article 7 of the Teacher's Act, teachers have the responsibility to participate in academic work, administrative affairs and social education activities. In-service teacher advancement education is help teachers to enhance teachers' professionalism and specialized knowledge of courses so that the overall quality of education is elevated. That is providing opportunities for professional growth, the possibility of continuing study and improving teaching and administration knowledge of teachers. In addition, it provides the concepts of new regulation for teachers to give their students.

In general, e-learning refers to asynchronous or self-paced learning (Kelly, 2001). To be more specific, e-learning refers to the use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance (Rosenberg, 2001). E-learning is based on three fundamental criteria: (1) it is networked, which makes it capable of instant updating, storage/retrieval, distribution and sharing of instruction or information; (2) it is delivered to the end-user via a computer using standard Internet technology; and (3) it focuses on the broadest view of learning – learning solutions that go beyond the traditional paradigms of training (Rosenberg, 2001, p. 28). E-learning can be defined as 'learning facilitated and supported through the use of information and communications technology'.

However, as e-learning becomes the world's new learning trend, distance courses have migrated to the Web where it is possible to incorporate online learning as a primary component of the course. Distance education provides one means of integrating technology across teacher preparation to meet the

growing needs of pre-service and in-service preparation programs (Spooner, Spooner, Algozzine, & Jordan, 1998). Today, teachers can spend their time to study a variety of in-service advancement education courses not only at schools, in-service teacher advancement education agencies, Universities with teacher education, Universities without the department of teacher education, Life-long learning organizations and also can study online (Kuo, Yang, Yu, Yang & Lin, 2010). From above, the previous studies were only done by survey not the actual participation of in-service teacher education on e-learning. Therefore this study will look for primary school teachers' actual participation of in-service teacher education using e-learning. We also curious about does primary school teachers' age impact on e-learning in Taiwan. Are there any general structures of primary school teachers participated online related course in in-service teacher advancement education? The expectation of this study is the results can be reference points in promoting related online courses of teacher advancement education, such as targeting audience so that the system of lifelong learning of teachers can be constructed.

2. Literature Review

2.1. Does professional development have an impact on teachers?

Kettle and Sellars (1996) in a study of the development of the 'practical theory' of student-teachers in Australia; by Kallestad and Olweus (1998) in a study involving Norwegian teachers, which shows that teachers' professional preparation and development have a large impact on defining teachers' goals for their students, and these goals in turn affect the teachers' behavior in the classrooms and schools; and also by Youngs (2001). Following the examination of data assessing the effects of four different models of professional development (teachers' networks, the use of consultants and inter-visitations, students' assessments and school improvement plans) on teachers' professional development and school capacity in different parts of the USA, Youngs found that all models generally strengthened teachers' knowledge, skills and dispositions, and they had varied effects on other aspects of school capacity (the constructing of a community, the gradual development of coherent programs, the quality of technical resources, etc.). Yet, there is still a need for more research to be done in this area (see Tatro, 1999).

2.2. E-learning

In general, e-learning refers to asynchronous or self-paced learning (Kelly, 2001). To be more specific, e-learning refers to the use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance (Rosenberg, 2001). E-learning is based on three fundamental criteria: (1) it is networked, which makes it capable of instant updating, storage/retrieval, distribution and sharing of instruction or information; (2) it is delivered to the end-user via a computer using standard Internet technology; and (3) it focuses on the broadest view of learning – learning solutions that go beyond the traditional paradigms of training (Rosenberg, 2001, p. 28).

2.3. Related Work

Based on Köck, M. & Paramythi, A. (2011) the work described herein falls within the broad field of research of Educational Data Mining (EDM) or data mining in e-learning (Romero and Ventura, 2006), which combines aspects and issues of different areas (e.g., e-learning/distance education, adaptive systems, etc.). In (Romero and Ventura, 2010), the authors categorize work in educational data mining into (a) statistics and visualization, and (b) web mining (Srivastava et al., 2000) that can be further split into clustering, classification and outlier detection, association rule mining and sequential pattern mining, and text mining. Web (usage) mining can additionally be further categorized into offline web mining aiming at the discovery of patterns or other information to help educators to validate learning models, and online or integrated web mining where the patterns that are discovered are fed into an "intelligent" system that could assist learners in their online learning endeavors (Li and Zaiane, 2004).

2.4. Aim of the Study

- Is there any relationship between course hour and age group?
- Is there any relationship between course hour and course content?
- Does primary school teachers' age impact on e-learning?
- To find the general structure based on profile (age group and course content) of in-service teachers studied online related courses of in-service teacher advancement education.

3. Study Design

3.1. Definition of terms

- **In-service teachers:** Refer to full-time teachers with teaching certificates serving in public and private K-12 schools.
- **Course content:** Refers to the teacher advancement education course either in “administration” or “teaching” or “others” category. In this study we focus on “administration” or “teaching”.
- **Age group:** 22-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, or 60 above.
- **Course hour:** Refers to number of hours teachers spent on in-service teacher advancement education course.

3.2. Research subjects

This is a longitudinal study. In this study, the primary school teachers in Taiwan who have been use e-learning to study related courses of in-service advancement education activities are the subjects during 2009 to 2010. We use Nationwide Teacher in-service Advancement Education Information Web (<http://inservice.edu.tw/>) database, it is authorized and directed by the Ministry of Education, Taiwan, randomly select 2001 sample resources out of 21,456. The sample size is calculated with 95% confidence level and confidence interval radius of 2.09 percentage points.

Table 1 and Table 2 are primary school teachers spend their time using e-learning by age group (sampled and population). Figure 1 shows primary school teachers spend their time using e-learning to study in-service education their age distribution of our sample similar to the population. The primary school teachers' age distribution of our samples using e-learning can represent the true population for in-service teacher advancement education since the sample from the random sampling. In other words, any age group of primary school teachers in Taiwan can accept the learning method of using e-learning to study in-service teacher advancement education.

Table 1. Sampled: primary school teachers spend their time using e-learning by age group

Unit: hours

Age group	Year		Total	Percentage (%)
	2009	2010		
22-29	443.0	562.0	1,005.0	6.20
30-34	1,026.0	2,164.0	3,190.0	19.68
35-39	1,630.0	2,951.0	4,581.0	28.26
40-44	1,202.0	3,072.0	4,274.0	26.36
45-49	612.0	1,608.0	2,220.0	13.69
50-54	204.0	438.0	642.0	3.96
55-59	111.0	158.0	269.0	1.66
60 above	24.0	6.0	30.0	0.19
Total	443.0	562.0	1,005.0	100.00

Table 2. Population: primary school teachers spend their time using e-learning by age group

Unit: hours

Age group	Year		Total	Percentage (%)
	2009	2010		
22-29	742,770.5	521,096.0	1,263,866.5	7.29
30-34	1,728,651.5	1,646,683.0	3,375,334.5	19.48
35-39	2,105,197.0	2,051,561.3	4,156,758.3	23.99
40-44	2,031,647.5	2,261,424.8	4,293,072.3	25.06
45-49	1,238,616.0	1,449,435.0	2,688,051.0	15.51
50-54	519,155.0	563,485.5	1,082,640.5	6.25
55-59	159,278.5	178,176.0	337,447.5	1.95
60+	38,134.0	42,120.5	80,254.5	0.46
Total	8,613,443.00	8,713,972.10	17,327,415.1	100.00

The basic data analyses are shown in Table 3. Table 3 shows there are 1567 and 434 persons/times to study course content “teaching” and “administration” respectively and they are primary school teachers.

Table 3. Number of persons/times by course content

Course content	Number of persons/times
Administration	434
Teaching	1567
Total	2001

3.3. Instrument & Data Analysis

The SPSS statistical software is used in this study. GLM is performed to see the relationship between dependent variable “course hour” and independent variable “course content” and “age group” analysis. The null hypothesis in this study is there is no relationship between course hour and course content; course hour and age group.

Cluster analysis is a method of discovering, via data, the groups of mutually similar objects, yet different from others. Therefore cluster analysis is to find the mode for primary school teachers their in-service teacher advancement education in Taiwan. Finally, GLM is performed again, but this time is to see the relationship between dependent variable “course hour” and independent variable “Cluster” (the groups just discovered from cluster analysis).

4. Results

Table 4 is the cluster frequency table. It shows primary school teachers used e-learning can classified into 7 groups. Two of these groups are the primary school teachers study “administration”, we named combined continue administration learner (age between 35 and 44) and combined discrete administration learner (age 22- 34 and 45+). Five of these groups are the primary school teachers study “teaching”, we named Combined discrete teaching learner (age 22-29 and 50+), Discrete teaching learner (age 45-49), Discrete teaching learner (age 35-39), Discrete teaching learner (age 40-44), and Discrete teaching learner (age 30-34). Table 5 shows Cluster is not statistically significant.

Table 4. Cluster frequency table

Unnamed cluster	Named Cluster	Frequency	Percent (%)
3	Combined discrete administration learner (age 22-34 and 45+)	195	9.7
5	Combined continue administration learner (age 35-44)	239	11.9
2	Combined discrete teaching learner (age 22-29 and 50+)	177	8.8
1	Discrete teaching learner (age 45-49)	234	11.7
4	Discrete teaching learner (age 35-39)	456	22.8
6	Discrete teaching learner (age 40-44)	407	20.3
7	Discrete teaching learner (age 30-34)	293	14.6
Total		2001	100.0

Table 5. Tests of Between-Subjects Effects (Cluster)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	107.958 ^a	6	17.993	.210	.974	.001
Intercept	118083.152	1	118083.152	1379.767	.000	.409
Cluster	107.958	6	17.993	.210	.974	.001
Error	170650.448	1994	85.582			
Total	302091.000	2001				
Corrected Total	170758.406	2000				

a. R Squared = .001 (Adjusted R Squared = -.002)
Dependent Variable: Course_hour

5. Conclusions and discussions

This study aims to find structure base on profile (age group and course content) of in-service primary school teachers studied online related courses of in-service teacher advancement education in Taiwan.

At the beginning of this paper it mentioned “according to the “Report of Digital Divides, 2007” by Research, Development and Evaluation Commission, Executive Yuan, younger people tends to use computer than older people. Younger people’s affinity for technology will allow them to better adapt to the process of modern learning, such as e-learning. However, this phenomenon cannot apply to the primary school teachers in Taiwan. The primary school teachers’ age distribution of our samples using e-learning can represent the true population for in-service teacher advancement education since the sample from the random sampling. In other words, any age group of primary school teachers in Taiwan can accept the learning method of using e-learning to study in-service teacher advancement education.

In this study it also shows there are no real relationships between course hour and course content, and course hour and age group for primary school teachers used e-learning to study related courses of in-service teacher advancement education. It means there is no distinction of age group and course content that the primary school teachers spent more time to use e-learning to study in-service advancement education. The behavior of primary school teachers using e-learning found in this study is against to the research survey done by Huang (2009) that the primary school teachers using e-learning does depends on age.

Primary school teachers who study online related courses of in-service teacher advancement education can be classified into 7 groups. Since the importance measures for all of the variables (age

group and course content) exceed the critical value in each chart, so it can conclude that age group and course content contribute to the formation of every cluster. For the age group, cluster 1, 4, 6, and 7 is comprised entirely of age group 45-49, 35-39, 40-44, and 30-34. Clusters 2 contain age between 22 and 29 and 50 years old and above. Cluster 3 has age 22 to 34 and 45 to 59. Cluster 5 contains age 35 to 44. For the course content, cluster 1, 2, 4, 6, and 7 is comprised entirely of “teaching”; cluster 3 and 5 is comprised entirely of “administration”. The biggest group is the primary school teachers used e-learning to study “teaching” with age between 35 and 39 and followed by age between 40 and 44. The result shows there is no evidence for particular group, the primary school teachers spent more or less time using e-learning to study in-service teacher advancement education.

To summarize above clusters. The primary school teachers used e-learning can be classified into 7 groups. Two of these groups are the primary school teachers study “administration”, we named combined continue administration learner (age between 35 and 44) and combined discrete administration learner (age 22- 34 and 45+). Five of these groups are the primary school teachers study “teaching”, we named Combined discrete teaching learner (age 22-29 and 50+), Discrete teaching learner (age 45-49), Discrete teaching learner (age 35-39), Discrete teaching learner (age 40-44), and Discrete teaching learner (age 30-34).

Although the statistical tests found in this study the primary school teachers using e-learning does not depend on age or course content but when these two variables put together, there will be important meanings on clustering. That is the clusters found in this study can be reference points in promoting related online courses of teacher advancement education, such as targeting audience so that the system of lifelong learning of teachers can be constructed.

References

- Ganser, T. (2000). “An ambitious vision of professional development for teachers”. In: *NASSP Bulletin*, 84(618), 6-12.
- Glatthorn, A. (1995). “Teacher development”. In: Anderson, L. (Ed.), *International encyclopedia of teaching and teacher education* (second edition). London: Pergamon Press.
- Johnston, M. (2004). CSU research finds rural women are best online learners. *Campus Review* 14(8), 10.
- Kellner, D. (2004). Technological transformation, multiple literacies and the re-visioning of education. *e-Learning*, 1(1), 9-37.
- Köck, M. & Paramythi, A. (2011). Activity sequence modelling and dynamic clustering for personalized e-learning. *User Model. User-Adapt. Interact.* 21(1-2), 51-97
- Kuo, L.H., Yang, H.H., Yu, J.C., Yang, H.J., Lin, L.. (2010). Identifying the Course Role of In-service Learning via the Social Network Structure. *WSEAS Transactions on Communications*, 9(9), 583-594.
- Li, J. & Zaiane, O.R. (2004). Combining Usage, Content, and Structure Data to Improve Web Site Recommendation. In *Proceedings of the 5th International Conference on Electronic Commerce and Web Technologies (ECWeb)*, p. 305-315.
- Ministry of Education, Taiwan (2010). Teacher’s Act [Online]. Available <http://unfitinfo.moe.gov.tw/laws.php>
- Perron, M. (1991). Vers un Continuum de Formation des Enseignants: Elements D’Analyse. *Recherche et Formation*, 10, 137-152.
- Research, Development and Evaluation Commission, Executive Yuan (2007). Report of Digital Divides, 2007 [Online]. Available <http://www.rdec.gov.tw/public/Attachment/871616535971.pdf>
- Romero, C. & Ventura, S. (2010). Educational Data Mining: A Review of the State-of-the-Art. *IEEE Transaction on Systems, Man, and Cybernetics, Part C: Applications and Reviews.*, 40(6), 601-618.
- Romero, R. & Ventura, S. (2006) Data Mining in E-Learning. *Advances in Management Information*. WITPress.com (4).
- Rosenberg, M.J. (2001). E-learning: Strategies for delivering knowledge in the digital age (pp. 344). New York: McGraw-Hill.
- Saiti, A. & Saitis, C. (2006). In-Service Training for Teachers Who Work in Full-Day Schools – Evidence from Greece. *European Journal of Teacher Education*, 29 (4), 455-470.
- Spooner, F., Spooner, M., Algozzine, B., & Jordan, L. (1998). Distance education and special education: Promises, practices, and potential pitfalls. *Teacher Education and Special Education*, 22, 121-131.
- Srivastava, J., Cooley, C., Deshpande, M. & Tan, P.N. (2000). Web Usage Mining: Discovery and Applications of Usage Patterns from Web Data. *SIGKDD Explorations*, 1(2), 12-23.

ASSESSING ONLINE LEARNER INTERACTION: A DISTRIBUTED LEARNING ENVIRONMENT MODEL

William L. Havice & Pamela A. Havice
Clemson University (USA)

Abstract

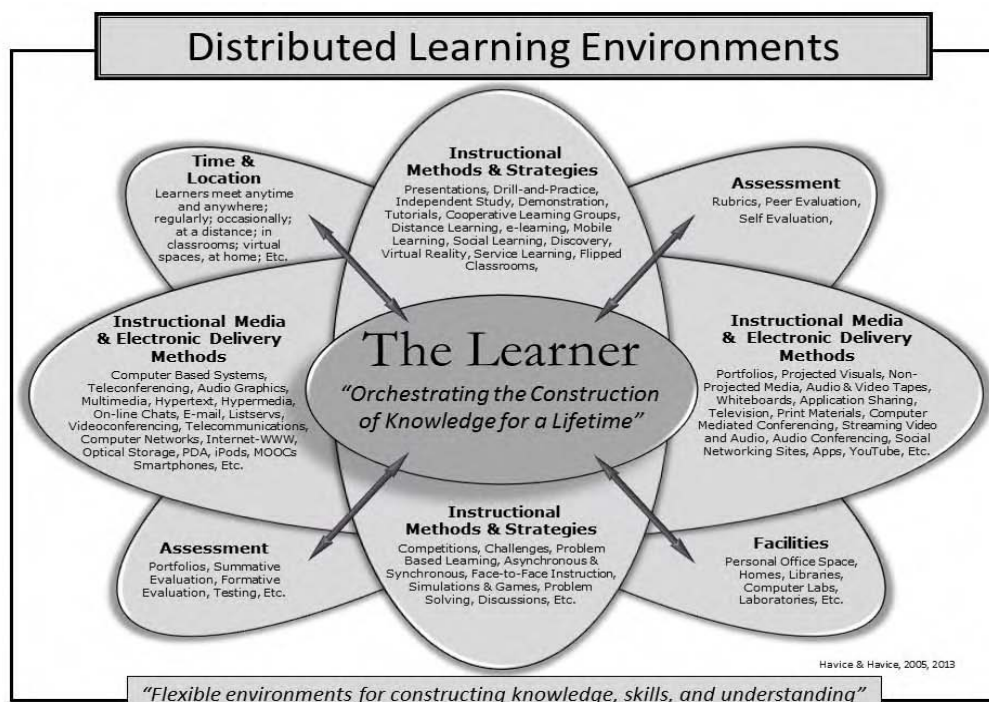
The primary goal of educators is to engage learners with the content of a subject matter and the associated learning activities. To promote this engagement the educator must make a myriad of decisions that impact the learning environment and the learner (Havice & Havice, 2005, 2015; Lockwood, 1998; Rigney, 1978). Distributed learning environments allow educators as well as learners opportunities for constructing knowledge, skills, and understanding (Matheos & Archer, 2004).

Keywords: *Distributed learning, assessment strategies, dialogue, rubrics, portfolios*

1. A Distributed Learning Environment (DLE) Model

As educators we must continue to explore new teaching and learning strategies, technologies, assessment tools and learning environments to better engage our students in the learning process. Utilizing constructivist approaches to learning, the authors have developed a distributed learning environment (DLE) model (See Figure 1.) that puts the learner at the center of orchestrating the learning environment to best meet the learner's needs. The model illustrates a broad array of options an educator has in designing and developing a distributed learning environment. This model depicts the overlap and fluidity that exists among the various components that an educator must decide upon when designing a distributed learning environment. Furthermore, the DLE model depicts the blending of traditional instructional elements, as well as those that have recently evolved with the advancement of communication and instructional technology.

Figure 1. Distributed Learning Environment (DLE) Model



With the advent of many distributed learning environments, i.e. online learning, e-learning, distance learning, m-learning, the role of the educator has been refocused to serve primarily as the subject expert who facilitates the learning process but who is not completely responsible for the teaching and learning transaction (Naidu, 2013). This change in role has emphasized the need for more of a team effort from instructional designers and media production experts. As part of designing the distributed learning environment the educator, along with other team members, must analyze and understand the learners and their learning context; develop goals and learning outcomes; analyze, sequence and synthesize content; engage learners with the subject matter; select media for learning and teaching; assess learning outcomes and provide feedback; as well as evaluate the efficacy of learning and teaching (Naidu, 2013).

2. Assessment Strategies for Encouraging Online Faculty-Student Interaction

The assessment of learning achievement is an important function. Educators are primarily concerned with how to best determine if learners have ascertained the desired level of knowledge and have accomplished the learning objectives. In contrast, learners are concerned with how their learning will be assessed, including when, where, and with what criteria. Learners are also quite anxious about receiving feedback as well as advice on their work. In the online distributed learning environment educators need to be particularly diligent in providing assessment information and feedback in a valid, reliable, equitable, and secure manner (Airasian, 1991; Grondlund, 1985; Naidu, 2013). Educators must also be sensitive to provide ample opportunity for students to receive feedback in a timely fashion (Bangert-Drowns, Kulik, Kulik & Morgan, 1991; Kulik & Kulik, 1988; Wiggins, 1998). In the following text we will share strategies for assessing or evaluating a learner's work, including: rubrics; dialogue; collaboration and teamwork; and portfolios.

2.1. Rubrics

Rubrics provide an alternative to assessing or evaluating a learner's work and performance while fostering a sense of learner empowerment in the online distributed learning environment. Simply, rubrics are a set of formal guidelines, scoring guides or rating tools used to rate examples of a learner's work or performance. The use of rubrics allows the educator to clarify the assessment criteria by which the learner's work or performance will be judged. Furthermore, rubrics are designed with clear criteria and standards to provide a fair and reliable means of scoring products, behaviors, assignments, etc., which are subjective in nature (Walvoord & Anderson, 2010). These guidelines can be helpful in scoring everything from individual student learning activities, writing samples, collaborative team activities, dialogue samples, as well as project development in online distributed learning environments (Roblyer & Wiencke, 2003).

There are a number of important advantages to the use of rubrics in the assessment process for online distributed learning environments. By design rubrics help the educator remain focused on the learning objectives of a course while being more consistent and objective in the assessment process. Through the development of a rubric the educator is forced to clarify the assessment criteria in specific terms. Learners often complain they did not understand the requirements for a required course activity. The use of rubrics help to minimize those complaints and to demystify or take the "guesswork" out of the expectations for a project. In demystifying a course activity we empower learners to focus on their weak areas while emphasizing the strengths in their work (Havice & Havice, 2015).

Encouraging learners to develop a consciousness about the criteria they use to assess their own abilities and performances, as well as assess the performance of their peers is another advantage of rubrics. Rubrics provide benchmarks against which to measure and document progress. The use of rubrics also support learner self-reflection, self-assessment and peer review as well as interaction between an assessor and those being assessed. In other words, rubrics emphasize the use of formative as well as summative evaluations and can enhance interaction between the educator and the learner (Roblyer & Wiencke, 2003).

A scoring rubric communicates expectations of quality around a task. These rubrics often consist of guideline grids or matrices with performance levels in the top row and performance dimensions along the left column. Each cell holds specific and objective criteria against which selected performance standards can be assessed. Often this format of rubrics then results in a given score in a given dimension. Rubrics characteristically provide for two to five performance levels (National Committee on Science Education Standards and Assessment, 1996).

Designing a meaningful and useful rubric takes time and effort. To assist educators in developing rubrics, here are five steps to keep in mind:

1. Create a more general rubric, not too task-specific, which can be used in more than one application or project;

2. Create a rubric that is focused on a limited number of dimensions. The dimensions of the rubric tell a person “where to look”. Limiting the number of dimensions to four or five will allow the educator to do a more thorough job of developing each dimension, thereby setting priorities for what is really important;
3. Make sure the criteria is concrete, measurable and teachable;
4. Create a rubric scale that is as “interval-like” as possible. This will provide a stronger, sounder rubric; and
5. Include learners in developing a rubric.

2.2. Dialogues

Online distributed learning environments utilizing discussion or dialogue tools, such as chat rooms, threaded discussions, blogs, wikis, social bookmarking, and social video tools (e.g. voicethread.com), as well as more standard bulletin boards and list serves, have become more common for both individual and group interaction. These dialogue-based approaches to learning have developed into a more valid learning assessment approach with the advancement of instructional and communication technology (Dennen, 2013). The ability to record and store transcripts of dialogue has enhanced the ability to use this approach for assessments. Additionally, dialogue approaches encourage interaction for the learner with both the educator and with peers. These distributed learning environment discussion tools can be used to encourage learner participation in critiquing journal articles, facilitating team discussions, debating posted issues, and responding to online reference materials to name a few ideas.

The authors have developed one strategy that has assisted in creating success with the dialogue approach. That strategy is the use of a facilitator for group discussions. This facilitator is important for keeping the discussions focused and ongoing. The authors have found in working with graduate-level learners that facilitation by the educator is important but also having individual learners take responsibility for facilitating discussions addresses a higher level of Bloom’s Taxonomy. For example, this facilitation could include the learner-facilitator challenging peers on posted comments or eliciting further discussion from team members. To assist in assessing the learner-facilitator we developed an online facilitator assessment tool. This tool allows for self-reflection and evaluation by the learner as well as feedback from the educator. For an acceptable evaluation, learners are expected to provide constructive comments, not just scores, on their evaluation.

We have observed that the use of structured Web-based dialogue creates opportunities for students who would not ordinarily participate in traditional face-to-face class discussions to become more willing to participate through a technology-based learning environment. As educators and learners become increasingly comfortable with interactive capabilities within a distributed learning environment interactive dialogue will become an ever more important component of the instructional process.

2.3. Collaborative Assessment through Teams

Within the distributive learning environment collaborative activities involving teams and groups can be effective strategies for enhancing the learning process. As educators who use a collaborative teams/groups approach online, the authors have found breaking larger classes into smaller groups of 3-5 learners assists with the collaborative process, especially in synchronous dialogue approaches. In making the discussion teams/groups smaller each learner is held to greater accountability for meeting the learning objectives. Within the smaller group it becomes quite evident to the educator which learners are prepared for the course activities.

To assist in assessing collaborative learning activities, the authors have developed a two-tiered evaluation process. This evaluation process is comprised of a self-evaluation and also a team evaluation in a collaborative learning environment. The first tier evaluation is an individual self-assessment tool that requires students to evaluate their personal participation in an online collaborative discussion.

We developed a second tier evaluation that allows for individuals who make up a team/group to evaluate the collaborative process, goals, and work behaviors of team members. Over the course of using this evaluation we have seen group challenges greatly minimized. Teams/groups have been much more involved in holding group members accountable for group work. Again, this tool requires the learner to provide constructive feedback in order for the evaluation to be acceptable.

2.4. Portfolios

For decades the traditional portfolio has been a sampling of the breadth and depth of a person's work conveying the range of abilities, attitudes, experiences, and achievements. Portfolios have been housed in folders, boxes, and 3-ring binders to hold papers, pictures, cassette tapes, and more. Today educators can use digital or electronic portfolios to document and assess what learners should know and be able to do in their journey in a distributed learning environment. Information can be stored digitally on

a computer hard drive or on multiple mobile devices such as smart phones, iPads, iPods, etc. This digital information takes very little physical space and is easily accessed. Digital or electronic portfolios are an effective vehicle for organizing, summarizing, and sharing artifacts, information, and ideas about teaching and/or learning, along with documenting personal and professional growth. The reflective process of portfolio development can be as important as the final product. Educators can use portfolios as part of their own personal development as well as a method of student assessment and evaluation.

Portfolios can fit into one of two broad categories. One category highlights a learner's best work over time. The second category of portfolios documents the ways an individual has grown over a period of time, by providing examples of earlier work and comparing them to recent work. This second type also includes reflections on the growth that the individual has experienced over the elapsed time. It should be noted, however, that these two categories are not mutually exclusive. A portfolio that demonstrates an individual's growth over a period of time can certainly help to prepare that individual to create a polished portfolio, highlighting only the learner's best work.

The learner's portfolio should be seen as a dynamic document. Educators need to think primarily about the purpose of the portfolio and then plan for the requirements. Should the portfolio contain only samples of a student's very best work? Or should the portfolio be more chronological in nature, which highlights and reflects on how a student has grown throughout the course of the semester? As an educator thinks about how the final version of the learner portfolio will look, one also needs to contemplate on what best helps the learner to realize ways that he/she has grown and to highlight what makes the learner unique. Campbell, et al. (2004) stated,

...many interviewers look to the portfolio for the attributes that make you different from other candidates. They are interested in documents that reflect, among other things: creativity, positive attitude, professionalism, organizational skills, writing ability, computer skills, potential to succeed, goal setting, leadership, efforts, achievements, honors, awards... (p. 58).

One of the most important items to immediately consider when creating a portfolio assignment is ensuring that students feel comfortable with creating the portfolio. We believe having learners share their portfolios with the class at different stages is a beneficial learning process. The class would provide feedback; the students would then reflect on that feedback and make changes to the portfolio. Therefore, rather than adding the portfolio requirement to the end of a class, we advocate this reflective process. The process of creating portfolios facilitates communication between learners and learners, learners and faculty, and other professionals. Creating portfolios provide an opportunity to reflect on personal growth and change throughout the program of study or a course. Further, the process can assist learners in becoming more articulate and self-confident about their profession during an interview or in conversation about their professional accomplishments.

Multiple methods of assessment are recommended when evaluating portfolios. Multiple methods could include grading random samples from the portfolio throughout the term, peer evaluations, and self-evaluations (Rogers & Chow, 2003). Rubrics are also an invaluable tool in portfolio assessment. The main consideration when deciding how to assess the learner's portfolio is to refer back to the learner objectives that were created for the course or program. The assessment strategies used should reflect the ways learners have or have not met these objectives.

3. Summary

Using the DLE model introduced in this presentation, educators can develop a successful, interactive online distributed learning environment using multiple forms for assessing the work and/or performance of learners. These forms for assessment must take into account the paradigm shift to increase the accountability for learning upon the learner in a distributed learning environment (Dennen, 2013; Roblyer, 2003). To facilitate this shift of accountability and to keep the learner at the center of the DLE, educators must continue to develop and refine assessment methods such as rubrics and portfolios as well as design methods not yet imagined.

References

- Airasian, P.W. (1991). *Classroom assessment*. New York: McGraw-Hill.
- Bangert-Drowns, R.L., Kulik, C.L.C., Kulik, J.A. & Morgan, M.T. (1991). The instructional effects of feedback in test-like events. *Review of Educational Research*, 61, 213-238.

- Borup, J., Graham, C.R. & Velasquez, A. (2010). The use of asynchronous video communication to improve instructor immediacy and social presence in an online course. In D. Gibson & B. Dodge (Eds.) *Proceedings of Society for Information Technology & Teacher Education International Conference 2010*. (pp. 337-344). Chesapeake, VA: AACE.
- Campbell, D. M., Cignetti, P. B., Melenzyer, B. J., Nettles, D. H., & Wyman, R. M. (2004). *How to develop a professional portfolio: A manual for teachers* (3rd ed.). Boston, MA: Pearson Education, Inc.
- Clark, R.E. (1983). Reconsidering research on learning from media. *Review of Educational Research*, 53(4), 445-460.
- Clark, R.E. (1994). Media will never influence learning. *Educational Technology Research and Development*, 53(2), 21-30.
- Dennen, V.P. (2013). Activity design and instruction in online learning. In M.G. Moore (Ed.), *Handbook of Distance education* (3rd ed.). New York, NY: Routledge.
- Grondlund, N.E. (1985). *Measurement and evaluation in teaching* (5th ed.). New York, NY: Macmillan.
- Havice, W.L. & Havice, P.A. (2005). Distance and distributed learning environments: Perspectives and strategies. Peoria, IL: Glencoe/McGraw-Hill.
- Havice, P.A. & Havice, W.L. (2015). Using a distributed learning model to foster learner-instructor interaction. In R.D. Wright (Ed.), *Student-Teacher Interaction in Online Learning Environments*. Hershey, PA: IGI Global.
- Kulik, J.A. & Kulik, C.L.C. (1988). Timing of feedback and verbal learning. *Review of Educational Research*, 58, 79-97.
- Lockwood, F. (1998). *The design and production of self-instructional materials*. London, England: Kogan Page.
- Matheos, K. & Archer, W. (2004). From distance education to distributed learning: Surviving and thriving. *Online Journal of Distance Learning Administration*, 7(4), 1-3.
- Naidu, S. (2013). Instructional design models for optimal learning. In M.G. Moore (Ed.), *Handbook of distance education* (3rd ed.). New York, NY: Routledge.
- National Committee on Science Education Standards and Assessment. (1996). *The National Science Education Standards*. National Research Council, 93.
- Rigney, J.W. (1978). Learning strategies: A theoretical perspective. In H.F. O'Neil, Jr. (Ed.), *Learning strategies* (pp. 165-205). New York, NY: Academic Press.
- Roblyer, M.D. & Wiencke, W.R. (2003). Design and use of rubrics to assess and encourage interactive qualities In distance courses. *The American Journal of Distance Education*, 17(2), 77-98.
- Rogers, G. M., & Chow, T. (2003). Electronic portfolios and the assessment of student learning. In T. W. Banta (Ed.), *Portfolio assessment: Uses, cases, scoring, and impact*. San Francisco, CA: Jossey-Bass.
- Walvoord, B. E., & Anderson, V. J. (2010). *Effective Grading: A Tool for Learning and Assessment in College* (2nd Edition ed.). San Francisco, CA, USA: Jossey-Bass (John Wiley & Sons, Inc.).
- Wiggins, G. (1998). *Educative assessment: Designing assessments to inform and improve student performance*. San Francisco: Jossey-Bass.

TOWARDS IMPROVED LEARNING QUALITY BY REMOTELY OPERABLE LABORATORIES

Ulrich Borgolte, Michael Gerke, Ivan Masár & Pavol Bahnik

*Faculty of Mathematics and Computer Science, Control Systems Engineering, FernUniversität in Hagen
(Germany)*

Abstract

Although nowadays eLearning is supported by a great variety of technical and organizational tools, there are still a number of open issues. E.g., eLearning material used is often based on lectures developed for face-to-face education, which does not take into account the particular learning situation of students with asynchronous contact only to their teachers. Static written material (e.g. PDFs), sometimes enhanced by video lectures, is still common. MOOCs do not improve this situation, as long as they are not carefully designed for the specific situation in distance teaching. The static material is sometimes complemented by dynamic simulators, which allow deeper insight in variable processes. But many of them lack a realistic approach, at least with respect to stochastic effects.

Learning engineering sciences is based on acquisition of theoretical knowledge and experience with the behavior of complex systems. Thus, text based learning can only provide for the first part. In traditional face-to-face education, practical experience is gained through hands-on experiments in laboratories. This approach dilutes the idea of distance teaching. Either, simulations are offered instead of real laboratories, or phases of attendance are necessary. In the first case, no physical system is involved, thus learning is limited to effects provided by the programmer. In the latter case, students need to spend time and costs for travelling.

This paper reports on three prototypical exercises based on real laboratory setups which are remotely accessible via internet connections. Students may control the laboratory setups, modify parameters, start different actions, and get results as actually recorded data sets. The labs cover different scientific areas: automatic control, digital filtering, and effects of gears. One of the labs is complemented by video transmission to allow a direct feedback of actions. Distance learners are enabled to deepen their theoretical understanding of the course material and to test their knowledge with real applications. The laboratories are on duty successfully since several semesters.

Keywords: *Virtual laboratory, remote operation, distance learning*

1. Introduction

Statistics on distance learning students at university level show that most of them are employed, e.g. Mydistancelearningweb (2015), Radford and Weko (2011). Therefore, attending laboratory exercises to be performed at specified times is not only a matter of travel costs, but also of individual time resources. While distance teaching universities usually presenting their courses via the Internet, laboratory training and experience as an integral part of engineering education still require physical attendance quite often. Despite substantial advances in virtual reality, few practical laboratory environments are fully accessible from the distance.

Simulations of real world devices may be an option where effects can be shown which are hard to realize in a laboratory environment (e.g. a space shuttle), or where random effects are negligible (e.g. simple electric circuits). But if the latter condition does not apply (e.g. if noise or random effects are affecting the results considerably), experiments are much better to understand when operating with real laboratory equipment.

About 10 years after inauguration of the WWW, the development of a large number of online experiments started at several universities all over the world. Few of these set-ups allow access and control of real laboratories. Until now, most experiments are based on simulations only, see Jiménez and Rodriguez (2006), Lemos, Leão, and Soares (2008), Ruzhitskaya and Speck (2008). Where a physical plant is remotely accessible, means of interaction vary from simple observation to full interactive control

of the laboratory devices, see examples in Teichmann and Faltin (2002), Bauer and Fedák (2010). For a discussion on the advantages and disadvantages of different laboratory types, see Elawady and Tolba (2009).

Beside reduction in travelling effort for distance learning students, there are two additional benefits which are addressing students of conventional universities, too. The first one is flexibility in time planning, as remotely operable laboratories in most cases are accessible at any time, independent of working hours of university staff. The second is a broader range of laboratories available, if several universities pool their labs and open them for any member.

The scientific discussion summarized by Ma and Nickerson (2006) on benefits of remote laboratories for students in general is still open. But interviews and questionnaires proved that the provision of remotely accessible laboratories provides a clear advantage to students who are locally and/or timely bound by employment, family obligations, or personal restrictions, see West, Spencer, and Willey (2004). Solbjørg (2007), Borgolte (2011).

In the late 1990s, the Control Systems Engineering group at FernUniversität in Hagen started the implementation of remotely operable real laboratories (Röhrig & Jochheim, 1999). Since then, almost all practical training experiments provided by this group have been converted to remotely operable mode, see Masár, Bischoff, and Gerke (2004), Borgolte (2009).

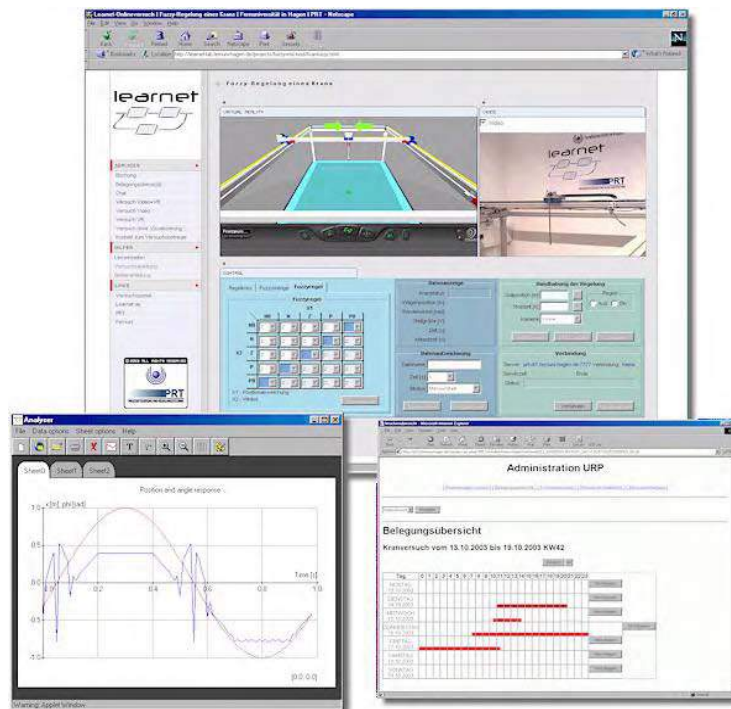
2. Laboratory setups

Three examples will illustrate remote access to real laboratory setups. As physical systems, stochastic effects resulting from friction etc. are influencing their behavior. All labs are accessible at any time, thus offering maximum flexibility to the users. Client hardware may be any standard computer with a web browser and Java Runtime Environment. For the control lab, a VRML Plug-In is needed if the virtual environment should be displayed.

2.1. Control laboratory

The first example is a laboratory for real-time control of an inverted pendulum and a gantry crane system. Students can select different types of controllers (e.g. PID, state-space feedback, fuzzy controller) and test parameters which they calculated based on their theoretical knowledge. This laboratory setup enables students to control the plant and monitor it in real time. Exact data is transferred to the students for in-depth analysis of system behavior.

Figure 1. Components of the remotely operable control laboratory



The upper window in figure 1 shows the user interface for interaction with the lab. Both video camera and virtual reality transmissions are displayed in real time. The latter allows high precision presentation even if bandwidth is too limited for videos. The lower left window illustrates system behavior based on actual data for detailed analysis. The lower right window shows the booking calendar to ensure exclusive access of a single student for a chosen time interval.

As this lab can be operated by one user at a time only, it needs some effort for exclusive access. Furthermore, security precautions had to be implemented to ensure that the physical system will not be blocked or damaged due to incorrect parameters of the controller. The impression of the lab is different when operating it directly or remotely, but the exact analysis of behavior is based on data sets in any case.

2.2. Digital filtering laboratory

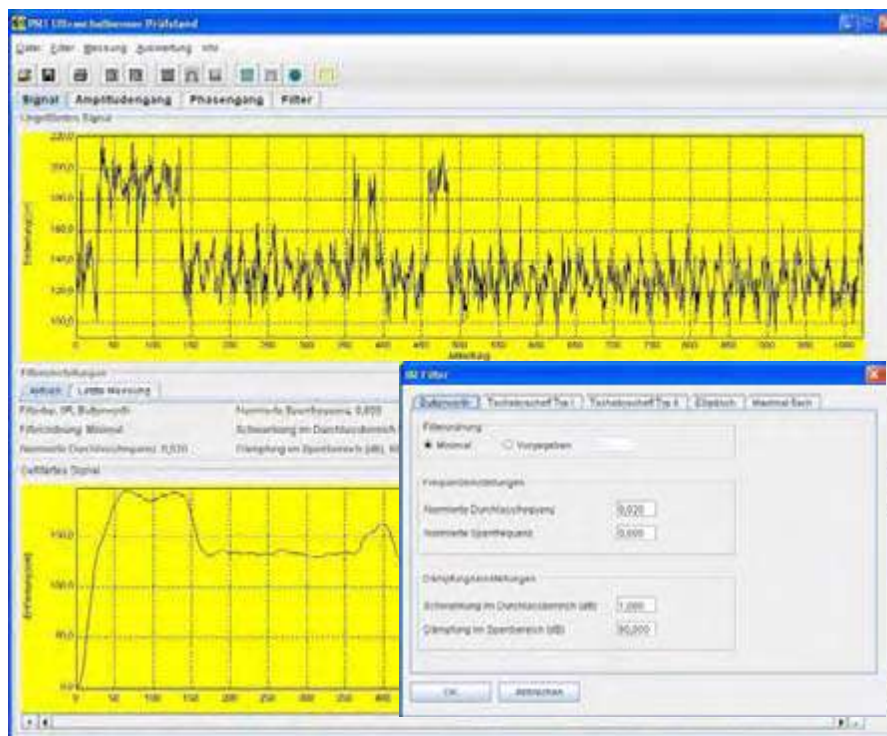
This lab addresses the digital filtering of noisy signals. It is based on an array of 4 low-cost ultrasonic sensors (figure 2), which provide noisy distance information via USB. A broad range of different digital filters can be applied to the raw sensor signal (upper half of figure 3); parameters can be set according to the theoretical background material provided to the students. In the lower half of figure 3, the filtered signal is shown. Students can download both data sets for further analysis at home, e.g. by their personal MATLAB installation.

This laboratory setup can easily be adapted to remote handling, as a computer interface for operation is needed anyway. There are no obvious effects sensible my humans, and digital filtering per se needs digital hardware. Thus the interface is simply enhanced for integration in a standard browser; students have the same look-and-feel as if present in the laboratory.

Figure 2. Array of ultrasonic sensors



Figure 3. User interface of filter lab with dialog box



2.3. Gearing laboratory

The third laboratory illustrates effects of mechanical gears, such as backlash, elasticity, and vibration. Figure 4 shows the start window of the lab, with a picture of the physical system. The lab is built up of a gear mechanism, driven by a motor, equipped with sensors for angle and torque. For each of the experiments within this lab, a pre-defined movement of the drive end is executed, and the corresponding motions and torques at the output end are measured. These measurements are presented to the students in different representations. In figure 5, stochastic effects can be observed, resulting in irregularities of motion.

As for the control lab, this lab needs exclusive access for one student at a time. Therefore, mutual exclusion has been implemented. Effects to be demonstrated cannot be sensed directly by the users, thus again a computer interface for data acquisition and presentation is needed independently of operation mode. For example, in figure 5 the difference between drive end and motor end position of the gearing is displayed.

Figure 4. User interface of gearing lab



Figure 5. Dialog box with pre-processed data



3. Conclusion

Three exemplary actual laboratories which are remotely operable have been presented. All of them can be used by distance learning students from any place, at any time they want. The look-and-feel of these labs is very similar to hands-on operation. The data students get for system analysis are the same as in a presence lab. By means of these labs, students are relieved from attending practical exercises at a given location and time. With the integration in a laboratory pool of several universities, the number of labs available is much higher than at a single university.

These laboratories allow observation of physical effects and identification of system parameters. Users can test system behavior under varying conditions, e.g. with different control architectures, parameters or various filter algorithms. The labs successfully served several hundreds of students.

Students profit from flexible timing for lab operation, the possibility to re-try exercises, a broad range of laboratories available, and access to the exercises in parallel to their individual progress in learning the theoretical background material.

References

- Bauer, P., & Fedák, V. (2010). Remote Controlled Experiments in Electrical Engineering: A Survey. *Proc. 8th Int. Conf. On Emerging eLearning Technologies and Applications*, Stará Lesná, Slovakia.
- Borgolte, U. (2009). Laboratory Conversion for Remote Operation. *Proc. 10th Int. Conf. Virtual University*, Bratislava, Slovakia.
- Borgolte, U. (2011). Development of an Online Digital Filtering Laboratory: First Year's Results. *Proc. World Conf. on Educational Multimedia, Hypermedia & Telecommunications*, Lisbon, Portugal.
- Elawady, Y.H., & Tolba, A.S. (2009). Educational Objectives of Different Laboratory Types: A Comparative Study. *International Journal of Computer Science and Information Security*, Vol. 6, No. 2, 89-96.
- Jiménez, E., & Rodriguez, M. (2006). Web Based Process Control Learning. *Proc. 7th IFAC Symposium on Advances in Control Education*, Madrid, Spain.
- Lemos, F., Leão, S.P., & Soares, F.O. (2008). SimLab: A Virtual Lab for Control Problems. An undergraduate Experience. *Proc. 9th Int. Conf. Virtual University*, Bratislava, Slovakia.
- Ma, J. & Nickerson, J.V. (2006). Hands-On, Simulated, and Remote Laboratories: A Comparative Literature Review. *ACM Computing Surveys*, Vol. 38, No. 3, Article 7.
- Masár, I., Bischoff, A., & Gerke, M. (2004). Remote Experimentation in Distance Education for Control Engineers. *Proc. 5th Int. Conf. Virtual University*, Bratislava, Slovakia.
- Mydistancelearningweb (2015). Characteristics of Distance Students. Retrieved 2015-02-10, from: <http://www.mydistancelearningweb.com/tips/students-characteristics.htm>
- Radford, A.W., & Weko, T. (2011). Learning at a Distance. Undergraduate Enrollment in Distance Education Courses and Degree Programs. Institute of Education Sciences, National Center for Education Statistics. NCES 2012-154.
- Röhrig, C., & Jochheim, A. (1999). Remote Control of Laboratory Experiments. *Proc. 19th World Conf. on Open Learning and Distance Education*, Vienna, Austria.
- Ruzhitskaya, L., & Speck, A. (2008). Computer-Based Simulation: Stimulating Learning in Astronomy. *Proc. World Conf. On Educational Multimedia, Hypermedia & Telecommunications*, Vienna, Austria.
- Solbjørg, O. (2007). Evaluating e-learning quality of an online repository for vocational training of automation technicians. *Proc. Annual Conf. European Distance and E-Learning Network*, Naples, Italy.
- Teichmann, T., & Faltin, N. (2002). Übersicht über Fernlabore. Retrieved 2015-02-10, from: http://www.l3s.de/i_labs/docs/Uebers_Fernlabore/uebersicht_fernlabore.html
- West, A.C., Spencer, J.L. & Willey, M. (2004). Web Web-Operable Remote Experimentation in Lecture Courses. Retrieved 2015-02-11, from: http://cache.org/site/news_stand/spring04/spring2004_westweb.pdf

PEDAGOGICAL MEDIATION BETWEEN TUTORS AND STUDENTS IN THE NATIONAL PROGRAM SCHOOL MANAGERS

**Leililene Antunes Soares¹, Rita Márcia Andrade Vaz de Mello²,
José Márcio Silva Barbosa² & Maria das Graças Soares Floresta²**

¹*Universidade do Estado de Minas Gerais, Brasil*

²*Universidade Federal de Viçosa, Brasil*

Abstract

In the XXI century, the new world order is sustained by socioeconomic development of education, science and technology. In this new scenario, the traditional roles of teacher, student and school need to be understood and investigated to meet the changes required. The distance learning redefines the roles of teachers and students, assuming differentiated position then that historically known. In this context, this study aimed to identify the effective pedagogical mediation by tutors in the process of promoting the learning of the course participants in the prospect of construction of knowledge in continued education coordinators in the distance course, under the National Program School Managers of Public Basic Education. This field research was carried out with 3 present tutors and 9 course participants engaged in the teaching profession in public schools in cities of Minas Gerais-MG, registered at the Universidade Federal de Viçosa, using as data collection instrument a questionnaire and semi-structured interview. The data were subjected to content analysis. We realize that the tutor is mediator because he is responsible for the development of the course. He is the professional who answers the questions, the doubts expressed by the student in all learning situations proposed by the tools available in the Virtual Learning Environments: forums, chats, wall charts, e-mail and others. For the course participants, distance learning is an educational option with peculiarities that characterize and distinguish it. Although not new, it is presented today as an alternative able to meet a demand for knowledge democratization and continuous and permanent education. The course participants understand that in addition to guidance and mediation is the responsibility of the tutor to provide additional teaching support helping them in their training to work in the teaching coordination of their schools. We highlight that the constant reflection on the mediation of the tutors is important in helping the teaching-learning process of the course participants. In this context, tutors, in the performance of their functions, rebuild their own practice, critically affect the system as a whole; and as educational mediators contribute to the development of quality distance learning.

Keywords: *Pedagogical mediation, tutor, distance education.*

1. Introduction

In the twenty-first century, the new world order is sustained by socioeconomic development of education, science and technology. In this new scenario, the traditional roles of teacher, student and school need to be understood and investigated to meet the changes required.

Distance education (EaD), known in the context of education in general and organized to form the new generations, to spread scientific and cultural knowledge produced by society, it is an option of the XXI century citizen, bringing in itself the limits and contradictions of modern society and also the possibility of social inclusion (FARIA, 2010).

In this scenario, the Universidade Federal de Viçosa (UFV) is part of the National Program School Managers of Basic Education and, in partnership with the Ministry of Education, offers the *Lato Sensu* Post-graduation Course in Pedagogical Coordination, with 400 initial enrollment, and 200 vacancies (50%) for the state schools and 200 vacancies (50%) for the municipal schools. These school managers come from 47 cities in the state of Minas Gerais. One of the reasons that led UFV to join the group of IES Mineiras that would give the course was, no doubt, the evident demand for the formation of teaching professionals (SOARES, 2012).

It is important to emphasize that in distance learning tutoring is an issue that is directly related to the teaching-learning process; it has an important role in the development of projects and/or distance

courses. Mentoring has the responsibility to act as a mediator and provocative "of true learning, that may lead the individual to carry out interactions that develop himself" (LINS *et al.*, 2005, p. 38).

Thus, this study aimed to identify the effective pedagogical mediation by tutors in the process of promoting the learning of the course participants in the prospect of construction of knowledge in continued education coordinators in the distance course, under the National Program School Managers of Public Basic Education.

2. Methodology

This is a qualitative study, which by being developed in a natural situation, is rich in descriptive data, with an open and flexible plan, focuses on the reality in a complex and contextualized manner (LUDKE; ANDRÉ, 1996). In qualitative research, the collection of information may involve various instruments. To carry out this research were used: questionnaires and semi-structured interviews.

Different questionnaires were prepared. The questionnaire of the tutors, consisting of 15 open questions, was sent to three tutors (33.33% of tutors) who work in classes A, B and C - so named to keep the anonymity of the cities.

The questionnaire of the course participants had 14 open questions and was sent to the course participants of the classes A, B and C, of the 30 sent, only 3 people from each class gave feedback (10%). The fictitious names used in order to maintain secrecy about the research subjects: Diva, Mara, Eve, Val, Sisi, Mel, Rose, Mari and Bia.

Both questionnaires were sent by e-mail and Google docs (application package that allows portability of documents).

Interviews were conducted with 3 tutors - Ana, Maria and Lia, fictitious names - to complement information.

The choice of semi-structured interview was made because it allows previously selected questions and, at the same time, enable the interviewee and the researcher freedom to address the theme proposed (CRUZ NETO, 2004).

The interviews were recorded and later transcribed for the analysis process. The data obtained from the interviews were analyzed according to the content analysis technique (PUGLISI; FRANCO, 2004).

3. Results and Discussion

Through the comments of the tutors realize how much their role in mediating the pedagogical actions and interaction between teachers, students and learning materials is important for the Post-graduate Course in Pedagogical Coordination. They act as facilitators of the process of teaching and learning, seeking the implementation of the principles of autonomy and responsibility of the learner, contributing to the creation of collaborative learning spaces.

"The pedagogical mediation happens when I act as a facilitator and encourager of learning, when I actively collaborate so that the learner reaches its goals." (Ana – tutor of the class "A").

"Pedagogical mediation is the act/or instruments that easier the learning. I was a mediator when using PVANet to promote the learning of course participants." (Lia – tutor of the class "C").

The tutor has, in his work of pedagogical mediation, to encourage the spontaneous process of knowledge construction, seeing himself as a person and subject of the whole process. Therefore, "it is necessary that tutors have the training and sensitivity to be mediators and binders of the learning process" (ASSIS, 2007).

The tutors assist in structuring the study components, guide and stimulate, besides provoking the course participants to construct their own knowledge, assuming that it is up to them to create a leading position of an action that has its reality as a reference.

About the use of Information and Communication Technologies (TICs) through PVANet (virtual learning environment of UFV used in the course), the tutors commented that they had difficulties to handle TICs.

Digital learning environments are systems available on the Internet, intended to support activities mediated by information and communication technologies to integrate multiple media resources and provide information in an organized manner, developing interactions between people and objects of

knowledge, develop and socialize with productions in order to achieve certain goals. The activities are carried on time, work pace and space in which each participant is located, according to an explicit intentionality and preplanning called educational design, which is the backbone of the activities to be carried out, being reviewed and continuously reworked in ongoing activity (ALMEIDA, 2003).

In this context, the resources of PVANet (forum, chat, virtual library, e-mail system, among others available to the tutors) were of great importance, helping the pedagogical mediation of the tutors, facilitating the monitoring of deadlines for posting the activities, frequency access control to the course, interaction and mediation between teachers and tutors, beyond the control of information according to established organizational criteria, defined according to the guidelines of the Course.

To develop distance education based on digital and interactive learning environments, it is necessary to prepare the professionals to develop the technological resources (softwares) consistent with the educational needs, which implies structure interdisciplinary teams consisting of educators, professionals design, programming and development of computer environments for distance education, with expertise in the creation, management and use of these environments (ALMEIDA, 2003).

The course participants conceptualize pedagogical mediation and identifies the processes carried out by the tutors:

"It is the collaboration in educational work, is the motivation for learning. The tutor was always an encouraging figure and facilitator of our learning." (Rose, class "C").

"Mediation is the involvement between the teaching-learning process. The tutor was always ready to help us, motivating and guiding at all times." (Bia, class "C").

Was consensus among the course participants that the tutors have developed an intense mediation role that permeated the interactions in the teaching-learning process, acting as facilitators, boosters and / or educational motivators.

Being an educational facilitator or academic advisor in the pedagogical mediation means conducting activities and situations in a "freer structure, a kind of set that allows students to explore not only the course material, but also materials related to it, without restrictions," such as any other technology adopted in the course (FERREIRA, 2009).

"Pedagogical mediation is the tutor who leads the student to reflect, to relate learning to the social context, it is the interaction between the tutor and the student. And the student identifies these pedagogical mediation processes for the guidance of individual and collective activities." (Mara, class "A").

Highlighting the assertion of Mel, class "B", which emphasizes the tutor's role of mediator, stressing her concern with the quality of the educational process and highlighting the use of PVANet resources as an agent to increase the interaction between teachers and course participants, facilitating collective action.

"Mediation is motivation to study and learn. I identify the effective pedagogical mediation process of my tutor through the feedbacks on time and always encourage us to use the resources available in PVANet to interact with teachers, colleagues and tutors. She worried about the collective both in presence and in the virtual environment." (Mel, class "B").

The role of mediator is highlighted in view of the concerns about the quality of the educational process and the indication of the use of various media as agents to increase the interaction between teachers and students and facilitate collective action. The authors also emphasize that distance education is characterized by being a process that consists of two mediations: human mediation and technological mediation, helping each other. The first, the tutoring system; the second, by the communication system that is at the service of the first, to enable the mediation. The resulting pedagogical mediation of the planned design between these two mediations is enhanced by digital convergence that provides access and portability through synchronous and asynchronous communication devices, more and more integrated, fast and powerful (SOUZA, 2004).

4. Conclusion

Based on the understanding that the present tutor is essential to the process of teaching and learning being closer to the course participants, we consider important to "give voice" to tutors and course participants, subjects in this study.

The tutors, through pedagogical mediation, established link between course content, helping the course participants in the learning process in the distance course, recognizing them as the subject of the educational process.

We realize that the tutor is mediator because he is responsible for the development of the course. It is the professional who answers the questions, the doubts expressed by the student in all learning situations proposed by the tools available in the Virtual Learning Environments: forums, chats, wall charts, e-mail and others.

For course participants, distance education is an educational option with peculiarities that characterize and distinguish it. Although not new, it is presented today as an alternative able to meet a demand for democratization of knowledge and continuous and permanent education.

The course participants understand that in addition to guidance and mediation is the responsibility of the tutor to provide additional teaching support helping them in their training to work in the teaching coordination of their schools. Note that the constant reflection on the mediation of the tutors is important in helping the teaching-learning process of course participants.

It is worth stressing that distance education (EaD) fulfills an important role in the globalized world, given that new technologies and possibilities are added to this modality, currently attended by various national and international organizations. In Brazil, the continued education through distance learning courses, implemented by official organs, is a reality, for example, the *Lato Sensu* Post-graduate course of Pedagogical Coordination, analyzed in this study.

References

- Almeida, M. E. B. Educação a distância na Internet: abordagens e contribuições dos ambientes digitais de aprendizagem. *Educação e Pesquisa*, São Paulo, v. 29, n. 2, p. 327-340, dez. 2003. Disponível em: <<http://www.scielo.br/pdf/ep/v29n2>> Acesso em: 19 jun. 2010.
- Assis, E. M. de. Gestão do Sistema Tutorial, à luz do imaginário do tutor e do aluno. 116f. Dissertação (Mestrado Profissional em Tecnologia da Informação e Comunicação) Unopar, 2007.
- Cruz Neto, O. C. O trabalho de campo como descoberta e criação. In: MINAYO, M. C. S. (Org.). *Pesquisa social: teoria, método e criatividade*. 23. ed. Petrópolis: Vozes, 2004.
- Faria, E. V. de. O tutor na educação a distância: a construção de conhecimentos pela interação nos ambientes midiáticos no contexto da educação libertadora. *Scientia FAER*, v. 2, 2010.
- Ferreira, Z. M. Prática pedagógica do professor-tutor em EaD no curso "Veredas - Formação Superior de Professores". 2009. 312 p. Tese de Doutorado. Faculdade de Educação. Universidade de São Paulo (USP). São Paulo. 2009.
- Lins, M. J. S. da C.; Neves, M. C. B.; Ribeiro, A. M. C. A aprendizagem e a tutoria. Educação a distância. SENAC, 2005, p. 37-38.
- Lüdke, M.; André, M. E. D. A. *Pesquisa em educação: abordagens qualitativas*. São Paulo: EPU, 1996.
- Puglisi, N. L.; Franco, B. *Análise de conteúdo*. Brasília: Líber, 2005.
- Soares, L. A. O tutor presencial na educação a distância: interação entre papel, atribuição, mediação e prática pedagógica na formação continuada de professores. 2012. 100p. Dissertação de Mestrado. Programa de Pós-Graduação em Educação, Universidade Federal de Viçosa, 2012.
- Souza, C. A. *et al.* Tutoria como espaço de interação em educação a distância. *Revista Diálogo Educacional*, Curitiba, v. 4, n.13, p.79-89, set./dez. 2004. Disponível em: <<http://www2.pucpr.br/reol/index>> Acesso em: 05 jun. 2014.

ONLINE EDUCATION: ANOTHER VISION ABOUT WEB RADIO

**Marcelo Mendonça Teixeira, Marcelo Brito Carneiro Leão, Elilton Oliveira,
Hugo V. L. Souza, Walter Felipe dos Santos, Ivonaldo Torres, Filipe Lima Gonçalves,
Demétrio A. de Santana, Nivaldo Marques da Silva Júnior & Hugo Pazolline**
Department of Chemistry / Federal Rural University of Pernambuco (Brazil)

Abstract

The use of ICTs in education is related to the revolution on the communication. Old education methods are being remodeled to absorb the benefits of the Web 2.0 tools. This new resource allows interaction and information exchange, and consolidates the teaching/learning process. The use of these tools on education opens a variety of possibilities for the teachers and students. Unlike conventional radio, Internet radio immediately sparked the interest of the broadcasting companies, once it did not impose limits on the listener's geographical range, nor on the exclusive audio format programming. These radios have not delayed in employing the technological resources of web radio, fact that can be sustained by the quantitative growth of online platforms, through which people can have access to the ordinary programming in real time by means of a great variety of devices connected to the Internet. This investigation considered it important to analyze the educational potentialities of web radios in portuguese academic universe. For that purpose, given the characteristics of the study, the research methodology used was of qualitative and empirical-descriptive.

Keywords: *Educational technology, web radio, ICT*

1. Introduction

On the educational field, the cyberspace has enabled the development of virtual learning environments, focused on the utilization of interaction software and the Internet itself as a pedagogic interface potentially capable of decreasing geographical distances and increasing interaction between student and instructor pairs, above all those who act on the distance education modality. In the late 80's and early 90's, a new socio cultural movement, originated by young professionals in big American cities and universities, reached a global dimension, and with no agency to limit that process, the different computer networks developed in the 70's joined together, while the number of people and computers connected to the network grew very fast, says Teixeira (2013). Thirty years of continuous growth of society and collective intelligence virtualization led to the Millennial Generation (or Generation Y), going from the operating system ENQUIRE development, by Timothy John Berners-Lee, and following Ted Nelson's Xanadu and Hypertext principles to culminate in the World Wide Web, in 1989. Progressively, the Web evolved from a static guideline (1.0) to a collaborative one (2.0), and after that to a guideline of contents portability, information connectivity and programming languages integration (3.0). Experts already talk about an artificial intelligence Web (4.0), as foreseen by Anandarajan and Anandarajan in Teixeira (2012). At the same time, numerous interactive resources are developed for the Internet and media digitalization.

In other sense, Bauerlein (2008) goes further in his "The dumbest generation: How the digital age stupefies young Americans and jeopardizes our future", by accusing the digital era of stupefying and idiotizing young people through anomy, isolation, addiction and cognitive overload. As well as in Portugal, in Spain also co-exists a reasonable number of academic broadcasters which are primarily characterized by a great range of varied programming, including numerous fields in which it is possible to find all kinds of genres and issues. In addition, university radios are broadcasters that foster radio-creation becoming themselves real alternatives to the general radio dominant content, as they offer a vast collection of Information, Culture and Entertainment. They are also a clear alternative to those contents which have leading role in the specialized offers field. We will proceed with the presentation of the results in accordance with the objectives of this research, now analyzing the web radios in the Spanish and Portuguese academic universe. In fact, the need of new sociability behaviors promoted new ways of

technological development, changing, shifting and creating unusual relations between Man and information and communication technologies. This was exactly what happened at the turn of the 20th century to 21st century when many revolutionary network communication electronic devices were developed. To Teixeira and Ferreira (2014), as a consequence of globalization and technological growth, the subsequent multiculturalism established a new social structure, consisting of different kinds of people and corporations, guided by interactions, collaborations and knowledge exchange in the newly adult virtual universe. Moreover, the potential of computer-mediated interaction is characterized by mutual interaction, interdependent and processes of negotiation, where each member is involved in building the cooperative relationship, affecting each other of reciprocal way.

2. Objectives

To define spatial and temporarily the evolution of the radio on the Internet is almost impossible, since this condition is intrinsically related to many factors, varying from the listening habits of the programs to socio-economical questions. However, a concrete indicator is the expansion of the web radio in the higher education (as occurs nowadays in some European Countries, like England, Spain, France, Italy, Portugal, among others), customizing the radio platforms and the audiovisual communication interfaces according with the target population. Thus, the present paper is focused on potentialities of web radio to high education in Portugal, according to the current literature on the subject.

3. Methods

Beyond this literature review on the concepts described, this investigation considered it important to analyze the educational potentialities of the web radio for the academic universe. In this sense, the methodology used is empirical-descriptive based on qualitative data survey in papers, books and Internet, collected on the second semester 2014.

4. Discussion

4.1. The University Web Radio in Portugal

According to research done on 1st September 2014, on ERC, “*Entidade Reguladora Para a Comunicação Social*” (Media Regulatory Authority) Website – a Portuguese government agency that regulates and supervises entities media activities on that country – no specific laws for Internet radio broadcasting were found. Radio Law in Portugal draws a distinction between generalist radios and thematic ones; the first ones are those whose content includes a vast array of themes, and the second ones are those that simply obey to a certain model, addressing a specific content, such as music, information or other, being ERC responsibility their respective classification. Alongside with the radios already mentioned, there are university radios produced for and aimed at university populations.

Figure 1. Website of Rádio Universitária do Minho



Font: <http://cultura.rum.pt/>

In Portugal, contrary to in other European countries, the university radios on the web appeared at the end of the 90's, and today, after almost two decades, few remain active in the national scenario. The radio researcher Paula Cordeiro, says that, in Portugal, in 2005, there were four university radios with FM emission and few projects of university radios in the web. Teixeira (2013) also shares the same information, identifying the *Rádio Universidade de Coimbra* – from Universidade de Coimbra; the *Rádio Universitária do Marão* – from the Trás-os-Montes and Alto Douro Region; the *Rádio Universitária do Algarve* – from the Universidade do Algarve; and the *Rádio Universitária do Minho* – from the Universidade do Minho, as the portuguese university web radios. Besides these, from the research performed for this work, we have identified the presence of other two university radios – the *Rádio Universitária Beira do Interior* – from the Universidade Beira do Interior, and the *Radio Zero* – from the Instituto Superior Técnico. In global terms, it is possible to assert that they share similar objectives, but have different and heterogeneous structures and program typologies. However, among the mentioned radios, the *Rádio Universitária do Minho* stands out presently for its diverse and segmented program on the web, dedicated to the promotion and divulgation of cultural, scientific and support activities to the lectures of the Universidade do Minho, representing, at the same time, some of its departments and academic unities, besides a strong cultural intervention in the local communities of the Braga and Porto Districts.

The *Rádio Universitária do Minho* (RUM) exists since 1989, and since 2006 it started to transmit via web, with a clearly heterogeneous program offer, on which spaces of purely formative-instructive character are mixed with others that explore different categories and formats, closer to some ongoing experiences in Europe. According to Leão (2007), the RUM launched two crucial interfaces in the context of its strategy to conquer and gain the loyalty of new public: the website and the online emission. The consolidation of the online emission, particularly, revealed as an alternative to the “conventional receptors”, emphasizing culture, debates on education, science, economy, politics, news, local informs, chronicles, interviews, and specialized reports. In its relationship to the Universidade do Minho, the RUM makes available the virtual space and a group of technological interfaces for the lecturers to divulge their scientific works, suggest readings, stimulate the debate on themes related to their disciplines (discussion forums), to inform grades, tests, interviews, divulge local, national and international academic events (congresses, seminars, talks, colloquiums, meetings...), store lectures in podcast (in a way that the student can have access to the discipline contents in any part of the world), besides the possibilities of synchronous and asynchronous communication with the broadcasting station, through E-mail, Blog, Messenger, Twitter, Facebook, Hi5 or Myspace (ibidem). Besides, it is on the program grid that the RUM is most different from other Portuguese university radios, for its thematic diversity and of the programs dedicated to the educational-cultural and journalistic categories.

This is the RUM online, functioning as a social communication vehicle of local communities and as a valuable space for the divulgation, socialization and popularization of science and technology, produced by different departments at the teaching institutions. According with the researcher Cordeiro (2005), the contribution and influence of university radios in the development of the future professionals' formation, allied to the importance in the context of radio-phonetic communication in general are incontestable, and, in a context where the main concern is the profit-making of the station, university radios appear as elements that offer alternatives of program and formation. It is also reasonable to argue that teachers' new space and time perceptions, as well as those of the teaching and learning process as a whole, are of a crucial importance in establishing a school under new paradigms, achievable through the application of electronic age concepts, such as *E-learning*, *Open School*, *University Without Walls* (UWW) and *Social Web*, i.e. the socialization phenomenon already taking place at a global scale in an environment of sharing experiences, information and online learning. Over the years, the media gradually adapted itself to the technological development and the social changes of each period, so much in the program schedule format, as in the genres and in the segmentation of the audience, transformations which ensured its continuity on the contemporary times. On practice, the radiophonic platforms offer a set of interactive resources that socialize the communication of the learner community on the virtual environment and present an integrated system of learning management, focused on the production of audiovisual and textual contents, and multimedia interactivity (Teixeira and Perona Páez, 2014).

Taking up a thought of Bianchi (2010) on the “hearing habits of the people”, the communication with the station changed from merely passive to actively participative, including the contact with other cyber-listeners in real time and the storage of contents in podcast or videocast produced by the own audience. Therefore, the fertility of contributions find its fullness on the synchronous and asynchronous access to the program schedule of the radio, and in the mobility of the mobile devices (tablet, cellphone, notebook, palmtop, etc.) destitute of predetermined geographic location to catch the signal, without time limitations. However, is known the burden on the obligatoriness of the user have a connection of good quality, because the speed of the traffic influences the browsing on the virtual environment of the radio,

emerges a range of options, in which topics are dealt under different approaches that are dominant in the conventional model, favouring the development of a critical and solidary perspective. Taking advantage of the Internet interactive potentials, university radio stations seem to demonstrate a certain sensitivity in ensuring the rights of access and participation, something that has been increasingly neglected in other communicative fields. Is possible to clearly observe the benefits that the technological advances are meaning to the development of the radio communication, when meeting the experimentation with new sound formats, the mediated interaction and the communicative complementarity which come from different digital interfaces on the Internet. We add the fact that the students seek ever more time flexibility, low cost to access the information, mobility and communication in real time with their peers. So, this is a wise investment for the universities, with guaranteed return on the production of knowledge on the teaching perspective, reality that we knew in Portugal with their University radios. Is a cultural question that transcends the “want to do”, the “want to implement”. Ahead of the possibilities, if the characteristics of teaching and learning be oriented in the way of incorporate the Web University Radio as an educative technology on the higher education; it will be a very interesting option for the online education.

References

- Bianch, G. (2010). *Memória radiofônica – a trajetória da escuta passada e presente de ouvintes idosos*. In Ferrareto, A. & Klöckner, L. (Org.). *E o rádio? Novos horizontes midiáticos*, pp. 11-27. Porto Alegre: EDIPUCRS.
- Bauerlein, M. (2008) *The dumbest generation: How the digital age stupefies young americans and jeopardizes our future*. New York: Penguin Group.
- Leão, V. (2007). *As rádios locais e o desenvolvimento territorial: As rádios universitárias*. Braga: Trabalho apresentado em seminário ao Departamento de Geografia da Universidade do Minho.
- Teixeira, M. M. (2015). *Inovação em Educação, Comunicação e Informática: Propostas do Núcleo Semente para a Sociedade da Informação*. North Caroline: Lulu Publish.
- Teixeira, M. M. & Ferreira, Tiago A. E. (2014). *Tecnologias de informação e comunicação: protagonistas da comunicação virtual*. Grin Verlag: Munich.
- Teixeira, M. M. & Perona Páez, J. (2014). *As novas modalidades do rádio na era digital*. Grin Verlag: Munich.
- Teixeira, M. M. (2013). *A rádio web na Península Ibérica: ambientes educomunicativos no ensino superior. Contextos e comparações de uma realidade contemporânea*. US: Lulu Publish.
- Teixeira, M. M. (2012). *As faces da comunicação*. Grin Verlag: Munich.

PEACEBUILDING ANTHROPOLOGY AS A NEW COURSE AT THE UNIVERSITY IN CENTRAL & EASTERN EUROPE

Katarína Slobodová Nováková

Department of ethnology and World Studies, University of Ss. Cyrila and Methodius in Trnava (Slovakia)

Abstract

The course of peacebuilding anthropology is a unique course in the middle of Eastern Europe, specially and only at the University of St. Cyril and Methodius in Trnava, Slovakia, combines practical and theoretical approaches to peacebuilding and is a good foundation for those who are interested in working in the conflict/post conflict environment in the frame of the international community. This course is especially for students, PhD. students and young assistants. We believe that students and academics who have the ambition to deal with ethnic or ethno-social conflicts could benefit from a practical aspect into the world of peacebuilding; vice versa, field researchers would be able to gain a deeper theoretical knowledge of the field of conflicts, peacebuilding and democratization. The course will offer: Comparative analysis of recent South-East European and East European ethnosocial conflicts (the Balkans versus Caucasus); Comparative analysis of recent ethno-social conflicts in European East and in Africa; Analysis of international community's efforts in peacebuilding and democratization in conflict/post-conflict areas.

Keywords: *anthropology, education, high school education, peacebuilding, peacekeeping*

1. What is Peacebuilding

In spite of different connotations work for peace (peacework) becomes a professional area, in which professionals and amateurs engaged in a nonviolent intervention in conflicts and building the conditions for sustainable peace. The birth of peacework as a professional field contributed end of the Cold War, change the dynamics of conflicts in the world, expansion of civic initiatives, shifts in leadership wars and many other factors. From high diplomacy, civic activism in the peace movement (peace movement), missionary activities of religious communities and humanitarian development projects by international organizations are gradually separates specific segment for which the conflict is not a lateral unpleasant characteristic, but constitutes the core of work. (Mihálik and Ondrušek 2009).

Work for peace is developing dynamically thanks to the activity of many actors engaged in conflict resolution, reconciliation, security, human rights, and community development. Parallel runs exploring and testing new features and tools of interventions in conflicts, emerge the lessons of evaluated projects, arise academic discourses based on research.

Peacekeeping anthropology is a unique approach to the problem so. Peacebuilding, which combines cultural anthropology and its related disciplines as a theoretical basis on the one hand, with rich practical experience in post-conflict field on the other. In peacemaking anthropology is viewed as a science an applied discipline relating to the cultural anthropology and ethnology.

The original concept of John Galtung is peacebuilding one of the three pillars of peacekeeping activities (along with peacebuilding and maintaining peace). Peacebuilding is directed to three key causes of conflict (Galtung 1969). Some associate it with the phase of "post-conflict reconstruction." Working with key causes of conflict but can occur at any stage of the conflict. Understanding well established in the European Union is approaching Galtung's definition. Peacebuilding activities sees as medium- and long-term targeted focus on root causes of violent conflict.

Department of Ethnology and non-European studies FF UCM in Trnava (Slovak Republic) began to address the issue of peacekeeping Anthropology since 2011. As the only university department in Central Europe professionally focused on the issue of inter-ethnic relations and peacekeeping operations. The aim is to offer students and doctoral candidates the opportunity to become familiar with the issues of peacebuilding and especially with the practical side of the field. Teaching realized in the form of optional subjects during Bachelor and Master study of ethnology, but especially as a 4-semester

course certified by the Lifelong Learning students and graduates not only of ethnology as well as various other courses and fields of humanitarian nature. University location in the heart of Central Europe with recent or current conflicts in the area creates conditions of utilization graduates work for peacebuilding in international structures.

2. Study Peacekeeping Anthropology

Offered courses and subjects explaining the essence of peacebuilding and its use in conflict/post-conflict areas with the help of theoretical models and analytical techniques to the phenomenon of ethnic, ethno-social, tribal and religious conflicts.

The study focuses primarily on the education of students/graduates in the humanities in order to increase competitiveness in the international labor market. That is saturated with recent graduates who cannot find employment often only on grounds of lack of readiness to operate in practice/field, or lack of awareness about the possibilities of career opportunities in the international sphere. Good readiness of our graduates could be the moment that ensures more effective peacebuilding efforts of the international community still exhibiting efficiency considerably limited. This limited effectiveness mainly Balkan and Eastern European peacekeeping missions is given a lack of understanding of local conditions ethno-social, processes and linkages, lack of critical thinking and creating a dual approach to individual problems.

The aim of the course is progressive approach to the problem of modern ethno-social conflicts which promotes the application of science to practice peace while trying to bring often sterile theoretical models crude post-conflict field. The result is a range of outreach activities, helping to streamline the work of peacekeepers and scientists in this challenging line of work as well as civil servants, teachers directly in post-conflict areas.

We strive to operate in three directions-professional education, art and dialogue, in five geographic regions: Central Europe, South-East Europe, Eastern Europe, the Great Lakes region (Burundi, Rwanda, Democratic Republic of the Congo, Uganda) and West Africa. All activities are conducted with an emphasis on direct experience in the field. Lecturers are experienced educators and peacemakers of the organization EEECC (East European Educational and Cultural Centre) who work at the Department of Ethnology in Trnava, which together with internal teachers (ethnologists, linguists, political scientists, psychologists) conducted theoretical and practical training. Many of them are engaged in long-term structures of the UN, OSCE, EU, IOM and NATO.

3. Methodology

Work of ethnologist/anthropologist is closely related to the stay in the field and with the study of ethno-social phenomena and processes in the studied community, its changes and interrelationships in a particular space and time. By its nature much like sociological research with which often overlap and affect. The similarity lies in how the organization of work and the characteristics of the studied phenomena or target group. Research on ethnic, ethno-social conflicts encourages a comprehensive approach that in methodology and in the work itself. Specificity and capriciousness topic does not allow always fully develop deductive-inductive learning strategy as we know it in configurationalists or structuralists (Soukup 2005), pretty much most of the Central European researchers "konfliktologists" with so-called abduction flirts.

What is a conflict and how to approach it in the learning process? Conflict (ethno-social, ethnic) is understood as the promotion of seemingly incompatible objectives by different individuals or groups.

Conflict does not have to be necessarily violent. Itself is an essential part of social change, natural, and sometimes even healthy as long as does not solve the violence. Thanks peaceful, political process leads to conflicts resolution or rather the transformation of conflicts. Transformation is understood as a long-term process of stopping the violence and achieving agreements. This is related to the maintenance of peace (peacebuilding) and coordinated efforts to ensure stability and relative normality in the aftermath of extremely explosive, unstable situations associated with violent conflict (Mihálik and Ondrušek 2009).

Conflict and post-conflict environment is transforming many standard mechanisms for completely unpredictable. Therefore should a man moving on this ground their observations implemented sensitively and individual phenomena and processes understood in its widest context. Only this way such a phenomena can be explained properly and prevent misinterpretation which is undesirable as for science as well as for post-conflict society itself. Each field research creates its own specific research procedures, methods and techniques. The methodology is thus forced to pursue two lines, official based on standard procedures and informal keeping with a rather "common sense." Field research in non-standard

environment requires a qualitative approach, effective techniques, flexibility, detachment, discipline, patience, specific knowledge and skills (Oriško 2015).

All of this the students learn during the practical blocks. Implement a number of simulations, learn to work in difficult terrain, to work under pressure in substandard conditions.

Theoretical block analyzes the status of ethnology/ cultural anthropology in society and the concept of peacekeeping anthropology. Reflection of ethnicity as a crucial aspect of peacebuilding is the main issue of teaching. Students become acquainted with the causes, course and consequences of individual ethno-social conflicts, data analysis, the contribution of Ethnology to the peace process.

The practical part is focused on practical exercises to improve the knowledge and skills students need to work in post-conflict field. In particular orientation training field, radiocommunication skills, crisis and documentary field, first aid in difficult circumstances, military English, survival in the field. Outdoor practical character block is the need to draw in participants "harsh reality of conflict. "It is a way of relationship with the local daily routine. Within the field practice students conducted field trips and field placements in post-conflict areas of Ukraine, Balkan-Kosovo, Moldova. We also make field trips to Africa (Zambia, Burundi, Western Sahara, etc.).

4. Conclusion

In work for peace practice in many ways precedes theory. In particular escalating conflicts capture and apply actors who decide not to stay in the position of the idle onlookers passers-by. The need to grasp the situation, understand it and to establish their own place of their own leads to the definition of the concepts and philosophy of engagement. The practitioners and theorists of various named by the same concepts as well as call it what it actually looks quite different (Mihálik and Ondrušek 2009).

A peacemaker does not have to be only a politician or a well-known personality. Peacemaker is everyone who dedicates the time, energy, and life sacrificing for the above objectives, the spread of peace, understanding, tolerance, the spread of humanity and mutual assistance. Peacemaker on the ground teaches how to make peace, how to behave in a country where peace is very fragile and just being born.

In today's world which is open more than ever but at the same time adrift so many conflicts and wars, humanity is more valuable. However, we do not wear rose-colored glasses and we know that for each mission, each goal and the path must be an individual well prepared physically, mentally, linguistically to control the cultural-historical, ethnic, confessional contexts, the political situation and the background to the conflict. The mere humanity, empathy and willingness is an essential ingredient. Others are knowledge, experience and outlook. These will experts in theory and practice transmit to all candidates.

Everyone can find an application. Language teacher, psychologist, anthropologist, investigative journalist, reporter, a social worker, a political scientist, a documentary filmmaker, a health worker, logistics, mediator, engineer. Gates are open to any active person who wants to be prepared. Ready to travel, work, leave a piece of himself in post-conflict countries that are dependent on outside help. Graduates have the opportunity to be placed in organizations such as the UN, OSCE, Doctors Without Borders and the like. They will have a better chance in getting involved in international projects and solutions peacekeeping missions.

References

- Galtung, J. Violence, Peace and Peace Research. In. Journal of Peace research, 6, 3, p.167-191.
Mihálik, J.& Ondrušek, D. (2009). Peacework. Bratislava: PDCS.
Oriško, J. (2015). Metody a techniky terénního výzkumu v nestandardních podmínkách. Kosovská zkušenost. Brno.
Soukup, J. (2005). Dějiny antropologie. Praha: Karolinum.

TOWARDS INTEGRATIVE APPROACHES THROUGH MULTILINGUAL ACTIVITIES: TEACHERS, PUPILS AND FAMILIES EXPERIENCING A COLLABORATIVE PROJECT

Sheila Padiglia & Francesco Arcidiacono

Research Department, University of Teacher Education (HEP-BEJUNE) (Switzerland)

Abstract

Within a EU-funded research project “SOFT: School and family together for the integration of immigrant children”, we are interested in elements of cultural and linguistic diversity in educational contexts where homogeneity is perceived as the exception and diversity the norm, such as in Switzerland. As schools consist of high percentages of speakers of different languages, such multicultural encounters are a resource for the development of integrative approaches involving children, teachers and parents. This study aims at exploring how newly designed activities of second language learning in classroom (and at home) enable interesting approaches and conditions for integration within multicultural settings. In order to achieve our goal, we have developed training activities and awareness-raising actions for teachers and parents about the potential benefits of multilingualism, providing native and migrant children a second language learning experience. This has been done through a narrative format model based on the following assumptions: learning a foreign language has to be done as we learn to speak a mother tongue; learning a foreign language needs interactive ways of teaching. We have tested this approach in three classes of primary schools and two kindergarten classes in a French-speaking region of Switzerland. A total of 15 teachers and 169 children (age: 3-7 years old representing 20 different nationalities) participated, using German and English as languages.

The results show a greater sensitivity and awareness of teachers in recognizing native and migrant students as learners who hold diverse linguistic and communicative repertoires, as well as expertise in managing communicative situations. Parents also consider that the experienced home-school activities promote good practices in teaching/learning languages and social processes.

The tested model seems to create conditions for a natural (informal, discursive) acquisition of languages. In this vein, schools can play the role of mediator helping young learners channelling their complex linguistic-communicative experiences into constructive and integrative learning experiences at school and at home.

Keywords: *integration, multilingualism, family-school collaboration*

1. Introduction

Within a EU-funded research project “SOFT: School and family together for the integration of immigrant children”, we are interested in elements of cultural and linguistic diversity in educational contexts where homogeneity is perceived as the exception and diversity the norm, such as in Switzerland. As schools consist of high percentages of speakers of different languages, such multicultural encounters are a resource for the development of integrative approaches involving children, teachers and parents. In this paper we intend to explore how newly designed activities of second language learning in classroom and at home can enable interesting approaches and conditions for integration within multicultural settings.

In the first part of the paper we present a concise description of the theoretical aspects of our research project about multilingualism. Afterwards, the methodology and the principles of the narrative format approach we have used will be presented in order to introduce concrete aspects of the project implementation in Switzerland. Data have been qualitatively analyzed and the main outcomes and results will be highlighted in the final part of the paper. The concluding section of the paper will offer some elements of discussion about the possible implications of the study.

2. Theoretical aspects

Switzerland has a long tradition of bilingualism and multilingualism, but it does not mean that the integration of a second language is easily carried out. As in other European countries, growing up with more than one language can sometimes be regarded as ‘special’ and ‘effortful’ and still surrounded by many false beliefs and misconceptions that are a direct result from lack of information. A prime example is that the home language of children from minority and migrant communities is regarded as an obstacle to successful linguistic and social integration. As a consequence, bilingualism in these communities is often abandoned and children are in danger of growing up with a negative perception of their home language and cultural identity (Bialystok, 1986; Sorace, 2007).

Nevertheless, recent research on language and cognition in bilingual speakers offers a completely different message. Many studies show that children who grow up with two languages often develop high levels of fluency and literacy in both, and even tend to have an earlier grasp of some key components of literacy (Flege, 1995; Archila-Suerte et al., 2012; Grosjean, 2013). Moreover, children who know more than one language have a spontaneous understanding of language structure and this makes it easier for them to learn additional ones. As a result, having one language can actually facilitate the development of other languages (Hamers & Blanc, 1984; Cummins & Swain, 1986).

Because bilingual children have to constantly switch between languages by choosing one or the other, depending to their interlocutors or even different situations, they develop a powerful mechanism for keeping the two languages separate (Emmorey et al., 2008). This is what lies at the root of other reported beneficial effects of bilingualism in non-linguistic domains involving mental flexibility and multitasking: bilingual children tend to do better than monolingual children at tasks where they have to selectively pay attention and ignore irrelevant information, or even switch between alternative solutions to a problem (Goetz, 2003; Bialystok, 2011; Rubio Fernandez & Glucksberg, 2012). Therefore, as multilingualism is becoming more common in our society, research on language and the brain provides very powerful arguments for encouraging bilingualism in young children and for maintaining minority languages, whether indigenous or introduced by international mobility (Arcidiacono, 2014; Pirchio et al., 2014).

For the reasons mentioned above, we are interested in elements of cultural and linguistic diversity in educational contexts where homogeneity is perceived as the exception and diversity the norm, such as in Switzerland, where high percentages of speakers of different languages contribute to such multicultural encounters. Through a narrative format approach, we intend to imply a design in which multilingualism is a resource for the development of integrative activities involving children, teachers and parents.

3. The narrative format approach

Language learning in the SOFT project is based on the narrative format approach (Taechner, 2005; Taeschner et al., 2008), an educational program resulting from previous European projects, which forms the theoretical underpinning of the language teaching/learning method.

The narrative format approach is based on four main principles:

- The principle of narrative format: the first assumption is that learning a foreign language is possible in a manner analogous to the processes of maternal language acquisition that is, through repetitive experiences, shared by the child with the adult. The use of storytelling, with the support of gestures and mimicry, allows the meaning of words and phrases to be learnt through active work.
- The principle of good communication: in order to learn to speak, an emotional bond between the conversational partners is essential. Establishing a relationship of affection and complicity is a key to motivate interlocutors and to improve their desire to communicate.
- The principle of bilingualism: choosing and keeping a common language of conversation (e.g. English for French speaking people) is the condition for avoiding communication in the everyday local language and for sharing the chosen foreign language during joint activities.
- The principle of linguistic progression: the development of vocabulary increases through the variety of experiences that are elaborated within different narrative formats (Bruner, 1983).

4. Methodology

The SOFT project (funded with the support of the European Commission, grant 531208-LLP-2012-IT-KA2-KA2MP) aims to enhance the linguistic abilities of children and adults, to encourage social integration of immigrant children and to improve the relationships between school and families. In other words, the goals of our study are the following:

- To improve the language abilities of participants in the language of the host country, in the languages of immigrant children and learning all together a new one;
- To facilitate social integration through different collaborative activities shared by families and teachers;
- To strengthen the relationships between school and families for the benefit of children and future school success.

In order to reach these goals, partners from different countries ("Sapienza" University of Rome, University of Rome 3 and Dinocroc International Training Institute from Italy; University of Edinburgh-Bilingualism Matters from United Kingdom; University of Teacher Education HEP-BEJUNE from Switzerland; Kommunale Integrationszentren from Germany; and Institución Pau Casals from Spain) have worked together through different stages to set up the project according to their various skills and expertise. In this paper, we are exclusively referring to the implementation of the project within the Swiss context.

4.1. Participants and instruments

In order to achieve our goal, we have developed training activities and awareness-raising actions for teachers and parents about the potential benefits of multilingualism, providing native and migrant children a second language learning experience. We have tested the narrative format approach in three classes of primary schools (1st and 2nd levels) and two kindergarten classes in a French-speaking region of Switzerland. A total of 15 teachers and 169 children (age: 3-7 years old representing 20 different nationalities) have participated, using German and English as languages. With the participants we have implied the following design: testing of pedagogical materials; interviews with teachers and parents about multilingual activities; observation and video-recordings of joint teachers-parents activities at school; ethnographic notes and audio-recorded activities at participants' homes.

The pedagogical material has been conceived as an educational tool to be used both in the classroom and at home. A kit has been delivered to teachers and children (and their families) in order to ensure the different teaching/learning activities to be performed within the project. The activities implied a work with songs through the CD, cartoons with the DVD, written stories with the books and e-books and online activities.

Each class takes place in the creative world concerning the adventures of two fantastic protagonists ("Hocus & Lotus"), where only the new language (English or German) is spoken by children and adults. In the classroom, children and teachers were performing the Hocus & Lotus stories all together, acting and repeating the episodes through the music, reading the book, learning colors and shapes, watching the cartoons in the language chosen for the activities. Teachers were trained to use the materials with children, to get into the imaginary world of Hocus & Lotus, and to interact with children in a very empathic way. A great attention has been paid to gestures and postures that can facilitate the experience of storytelling with children.

Concerning families, the importance of parents' involvement was taken into account not only to ensure better school results but also to help social integration of the children. Within our pedagogical program, daily activities at home were requested to parents and children in order to provide the necessary daily contact with the chosen foreign language. Parents were sharing the language learning activities by listening the CD songs, watching the cartoons and reading the books with their children.

5. Qualitative analysis

Along the duration of the program, we have monitored the activities that participants have done at school and at home by different visits and exchanges with teachers, parents and children. Data have been obtained through different channels (cf. the section 4.1) and have been analyzed through an inductive approach. More precisely, specific sequences have been identified as examples of multilingual practices through a synoptic analysis and have been used to detect the improvement of the participants' linguistic self-confidence and of attitudes towards integration and collaboration. By crossing different sources of data (mainly interviews, participant observations), we have found multiple findings.

A key point concerns the fact that language learning is based on collaborative activities in which children work together as a group in the classroom. Here, everyone is equal, regardless of the first language. Children learn the value of speaking more than one language, and in time they may also come to benefit from some of the cognitive advantages of bilingualism. Most important is the sense of belonging that the children get from exploring a brand new language together. As children have this opportunity to live a real enthusiastic way of learning a new language, results show that is this case, because children spontaneously speak the new language at home, share it with parents (during meals, travels or other occasions where they can use words and expressions of the new language they are

learning). Teachers and parents then work together on additional activities, strengthening the relationship between schools and families, which is important for children's futures.

6. Discussion and conclusion

The idea behind the SOFT project is that the diverse languages and cultures that people bring with them, for example when moving countries, are huge assets. Integration is not about forcing people to stop using their home language; it's about creating a situation where everyone feels valued and accepted. We want people to feel comfortable using both their home language and the language of their new country (or even another new language). The SOFT project takes schools as an important starting point for this feeling of acceptance, by encouraging classes to learn a language together (Padiglia & Arcidiacono, 2014). We are convinced that, through language and dialogue, the ability to interact is a product of this discursive process of co-construction of meaning and sense. This is an approach largely inspired by the work of Vygotskij (1934), with the idea to understand the socio-cognitive dimensions of thought processes and to study the conditions that allow interactions to promote learning. Social interactions are not considered as an external element or as a composite variable that affects cognitive development and learning: it is rather a set of individual and collective dimensions related to language, communication, intentions individuals, their goals, their social representations and results of dynamics in which they are interacting (Baucal, Arcidiacono & Budjevac, 2011). The socio-cultural perspective (Wertsch, 1985; Rogoff, 1990; Valsiner, 1995; Pontecorvo & Arcidiacono, 2010, 2014) is very useful in this regard because of the interactional nature of the selected contexts (family and school). In fact, these settings are considered as opportunities given to children and adults to reinforce learning and positive attitudes in the process of confrontation with differences and socialization (Resnick, Pontecorvo & Säljö, 1997; Arcidiacono, 2013).

We intend to conclude this paper by highlighting that the flexible nature of the project has been a great opportunity to adapt the implementation of the activities to the specific demands of the field. The pedagogical material conceived within the project has been easily adapted to different situations and used, as seen in some classes, in addition to an already established curricular program. The rich variety of materials also allow participants to choose what seems most relevant to the classroom or family activities, in different ways, contributing to put the language and its use in the center of the device, in highly motivating ways. The schools involved in the project have chosen to continue to use this material in the coming years, which allows transmission of knowledge among teachers of various school levels in the medium term. Teachers that have been trained in the use of narrative format are therefore able to pass further the educational tools necessary for the proper use of educational resources, in accordance with local requirements. In the next future, this will also positively reinforce the connections between schools and families by the implementation of new joint activities.

References

- Archila-Suerte, P., Zevin, J., Bunta, F., & Hernandez, A. (2012). Age of acquisition and proficiency in a second language independently influence the perception of non-native speech. *Bilingualism: Language and Cognition*, 15, 190-201.
- Arcidiacono, F. (2013). Conversation in educational contexts: School at home and home at school. In G. Marsico, K. Komatsu & A. Iannaccone (Eds.), *Crossing Boundaries. Intercontextual Dynamics between Family and School* (pp. 83-107). Charlotte, NC: Information Age Publishing.
- Arcidiacono, F. (Ed.) (2014). *Hétérogénéité linguistique et culturelle dans le context scolaire*. Bienne: Editions HEP-BEJUNE.
- Baucal, A., Arcidiacono, F., & Budjevac, N. (Eds.) (2011). *Studying interaction in different contexts: A qualitative view*. Belgrade: Institute of Psychology.
- Bialystok, E. (1986). Levels of bilingualism and levels of linguistic awareness. *Child Development*, 57, 498-510.
- Bialystok, E. (2011). Reshaping the mind: The benefits of bilingualism. *Canadian Journal of Experimental Psychology*, 65(4), 229-235.
- Bruner, J. (1983). *Child's talk: Learning to use language*. New York, NY: Norton.
- Cummins, J., & Swain, M. (1986). *Bilingualism in Education. Aspects of theory, research and practice*. London: Longman.
- Emmorey, K., Luk, G., Pyers, J., & Bialystok, E. (2008). The source of enhanced cognitive control in bilinguals: Evidence from bimodal bilinguals. *Psychological Science*, 19, 1201-1206.

- Flege, J. (1995). Second language speech learning: Theory, findings and problems. In W. Strange (Ed.), *Speech perception and linguistic experience: Theoretical and methodological issues* (pp. 233-277). Baltimore: York Press.
- Goetz, P. (2003). The effects of bilingualism on theory of mind development. *Bilingualism: Language and Cognition*, 6, 1-15.
- Grosjean, F. (2013). Bilingualism: À short introduction. In F. Grosjean & L. Pi (Eds.), *The Psycholinguistics of Bilingualism* (pp. 5-25). Chichester: Wiley-Blackwell.
- Hamers J. F., & Blanc, M. (1984). *Bilinguisme et bilinguisme*. Bruxelles: Margada.
- Padiglia, S., & Arcidiacono, F. (2014). Intégration et enseignement/apprentissage des langues: le projet SOFT pour lier école et famille. In F. Arcidiacono, F. (Ed.), *Hétérogénéité linguistique et culturelle dans le context scolaire* (pp. 61-74). Bienne: Editions HEP-BEJUNE.
- Pirchio, S., Taechner, T., Passiatore, Y., & Tomassini, G. (2014). Gagner le défi de l'éducation bilingue: l'application du modele du Format Narratif à l'école et en famille. In F. Arcidiacono, F. (Ed.), *Hétérogénéité linguistique et culturelle dans le context scolaire* (pp. 47-59). Bienne: Editions HEP-BEJUNE.
- Pontecorvo, C., & Arcidiacono, F. (2010). Development of reasoning through arguing in young children. *Культурно-Историческая Психология / Cultural-Historical Psychology*, 4, 19-29.
- Pontecorvo, C., & Arcidiacono, F. (2014). Social interactions in families and schools as contexts for the development of spaces of thinking. In T. Zittoun & A. Iannaccone (Eds.), *Activity of thinking in social spaces* (pp. 83-97). New York, NY: Nova Science Publishers.
- Resnick, L. B., Pontecorvo, C., & Säljö, R. (Eds.) (1997). *Discourse, Tools and Reasoning: Situated Cognition and Technologically Supported Environments*. Amsterdam: Springer.
- Rogoff, B. (1990). *Apprenticeship in thinking: Cognitive development in social context*. New York, NY: Oxford University Press.
- Rubio Fernandez, P., & Glucksberg, S. (2012). Reasoning about other people's beliefs: Bilinguals have an advantage. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 38(1), 211-217.
- Sorace, A. (2007). The more, the merrier: Facts and beliefs about the bilingual mind. In S. Della Sala (Ed.), *Tall Tales about the Mind and the Brain: Separating Fact from Fiction* (pp. 193-203). Oxford: Oxford University Press.
- Taeschner, T. (2005). *The magic teacher*. London: CILT.
- Taeschner, T., Rinaldi, P., Tagliatela, D., & Pirchio, S. (2008). Le parole per raccontarmi. Una ricerca sull'apprendimento dell'italiano da parte di adolescenti figli di immigrati. *Psicologia dell'educazione e della formazione*, 10(1), 21-35.
- Valsiner, J. (1995). Editorial: discourse complexes and relations between social sciences and societies. *Culture & Psychology*, 1, 411-422.
- Vygotskij, L. S. (1934). *Myslenie i rec'*. *Psichologiceskie issledovanija*. Moscow: Gosudarstvennoe Social'no-Ekonomiceskoe Izdatel'stvo. (Engl. transl. *Thought and Language*. Cambridge, MA: The MIT Press, 1962)
- Wertsch, J. V. (1985). *Culture, Communication and Cognition: Vygotskian Perspectives*. Cambridge: Cambridge University Press.

THE PERFORMATIVE INTERCULTURAL PEDAGOGY – THE ANARCHIC ARTS OF LEARNING AND TEACHING IN/BETWEEN SCHOLARIZED WORLDS AND SUBJECTS

Anja Maria MacKeldey¹

Unipluriversidad, Universidad de Antioquia/Associated researcher (Colombia)

German Department, GIB/ Colegio Alemán Medellín, teacher (Colombia)

Abstract

Today, our virtual and urban worlds experience a growing hybridization of the ways we "know," think and live. As humans, we must learn to handle these hybrid worlds and be conscious of their effects. We also have to manage and be aware of the moments of transition and the binary radicalization, that is to say, the reappearance of polarized worlds which don't want to or don't know how to, recognize the hybrid environment. Within this context, PIP offers formative concepts and methods that take question and take advantage of hybridization processes in ourselves and our surroundings. To this end, we intend to awaken our sense of responsibility and to form the ability to conceive ourselves as solidarious citizens of these worlds under constant changes. PIP considers this concept "an-archic" (no beginning) as an opportunity to make chiasmic hybridity (being actor and acting simultaneously) understandable, teachable, and learnable in identity related and methodical processes. From the "no beginning" we can counterweigh binary radicalization and promote the attitude of solidarity. In order to conceptualize PIP, rhizomatic methods of research process of the doctorate were instrumentalized, in and with high school, of a Colombo-German educational context in Medellín, Colombia between 2004 and 2010. Two experiences related to the hybridization in the identities processes are shown as examples, as well as, one experience in relation to methods. The feedback from students, experts, and positive results underscore the need to consider the PIP as an aid in the active and conscious management of the subjectivities and worlds in a state of hybridization and/or (re) - binarization. Since the majority of the curriculums is still based on binary perspectives and knowledge, it is the task of the conceptualization of the "an-archic art of teaching and learning." It is the task co-constructed experiences in and around the classroom by the PIP to demonstrate the advantage of applying an-archic contents and methods in high school, especially in urban-intercultural contexts.

Keywords: *hybridization, pedagogy, acted-actor, an-archy, high school*

1. Introduction

The history of humankind cannot be imagined without its migrant movements and constant changes of norms and ideas. Nevertheless, the education of the 20th century doesn't seem be sure how to face these changing realities. Let's take a brief look in the two national cultures, Colombia and Germany, which build the background of our educational context in Medellín, Colombia. The Colombian government started a few years ago an official opening towards the LGBTI-community. At the same time, the publishing of a photo in a social network that shows two boys kissing leads to a hard reaction of the photo-publisher's school and to a demand by the parents of the other one, situations that co - construct the decision of suicide of 17 year old Sergio Urrego who published the photo.² In addition, Germany faces a new phenomenon just like England and France: the power or fascination that exercise the radical ideas of the Islamic State ISIS. Andreas Zick (2015) professor of socialization and conflict research in the University of Bielefeld, Germany, arguments that the identification of a lot of adolescent boys and girls with the radical ideas reflect the fact that something is going wrong in the German society. For the educational context, he develops the thesis that. "*it may sound strange, but we have to see that the radicalization is a formative process, because in this context, you work a lot with politics and culture*" (without page reference)³

¹ The author is responsible for all translations in the text

² <http://www.elspectador.com/tags/sergio-urrego> (22.12.2014)

³ Lenzen, M. (22.01.2015) Beitrag Psychologie Heute Radikalisierung ist auch ein Bildungsprozess, *Psychologie heute*, 22.01.2015 retrieved from <http://bildungsklick.de/a/93027/radikalisierung-ist-auch-ein-bildungsprozess/> (24.01.2015)

Considering such circumstances of transition to hybridization and re-binarization, we will make use of the Intercultural Performative Pedagogy (IPP), a transformation of the research process methods applied between 2005 and 2010 in and with the high school students of the German School Medellin and the following pedagogic applications between 2011 and 2014. This pedagogy seeks to make understandable, teachable and learnable mechanisms that come to existence in our occidental urban and virtual – especially adolescent - worlds, with the help of the meta-concept “an-arch” – without beginning – and its manifestation in hybrid and chiasmic processes, i.e. in our identity games and our maieutic-didactic actions.

2. The an-archic arts of learning/teaching acted AS actors in hybridizing worlds

If we come to speak about “anarchy”, the most appearing connotation is “chaos”. This can be explained by the anti – governmental actions of political anarchists in the second half of the nineteenth century in Russia and in the first half of the twentieth century in the U.S.A. and in Spain. But in our educational context, we are interested in the etymological significance of an – arche, that is, “no – beginning, no – governance.” Therefore, the political anarchic philosophy includes acted actors, in the words of Irving Louis Horowitz (1982) ⁴ “we see ourselves facing a negative concept of anarchy as a state of rebellion, in contrast to the positive vision of anarchy as the recognition of the superfluous character of the governmental norms.” (42) Leon Tolstoi is a very important example of a possible application of the mentioned chiasmic character of anarchic education: The famous author of works like *Guerra y Paz* o *Ana Karenina*, who interchanged regularly letters with Mahatma Gandhi founded the libertarian school *Jasnaja Poljana*. There he pretended to combat the governmental failure of education in the Russian countryside, and co-constructed with his students the theoretical and practical aims they considered important. In this space, they could put in practice the aims of an anarchic-solidaristic pedagogy that is, according to Ulrich Klemm, the formative process to become (2002) ⁵ “an autonomous personality, a free human being who is outstanding for his/her free will (Stirner) and/or his creative personality (Read).” (107) In order to form such a “free” personality, - free in the context of the an-archic no beginning to decide if he/she wants to act as a solidaristic citizen. Therefore, we propose here with the Performative Intercultural Pedagogy to make a conscious use of some “characteristics without beginning” that are important nowadays in educational contexts because they can help to take conscious co-constructive decisions. In the following, we explain the concepts “chiasmic”, “hybridization” – that form the opposite to the “(re) binarization”. This is the first approach to the anarchic arts of teaching/learning acted actors in hybridizing worlds, that is to say, to develop the skills to decide if we want to recognize the diversity of acted actors and the co-constructed responsibility of a solidaristic citizen in a hybridizing world in constant changes, including changes to the re-binarization.

2.1. Our chiasmic condition

The world is not what I think, but what I live. Maurice Merleau-Ponty⁶

The French philosopher Merleau-Ponty perfects in *Fenomenología de la percepción* (1975), the phenomenological focus, and interrelates the Körper -body-object (spatial thing) and the Leib-subject (the body of one's own organic and living body) starting with a movement that puts in scene the intentionality of the body, and that

Invites us to recognize, between the movement as a process in third person and the thinking as a representation of the movement, , an anticipation or comprehension of the result that is assured by the body itself as a motor potential, a “motor project” (Bewegungsentwurf), a “motor intentionality”. (127)

At the same time that the body withdraws from the objective world and bestarts to form a third type of being between the pure subject and object, the subject loses its purity and transparency. (362)

2.2. Hybridity: constructing identities in the limits

In order to know more about this “third space, we have to remember that etymologically the concept “hybrid” means according to Langenscheidt (1985) *hybrida,ae, masculine and feminine (foreign word with unknown origin) (neoclassic, poetic): mixture of humans and animals*⁷. It can be supposed a possible relationship with the concept of *hybris* that designates the human cross passing of human-divine limits in the negative sense. In this context, the borders are no simple lines in the map, but in the words of Susan Stanford (2003) *places of hate and of murder actions, comparable to the friction of the*

⁴ Horowitz Irving, L. (1982) *Los Anarquistas I. La Teoría*. Madrid: Alianza

⁵ Klemm, U. (2002) *Anarchisten als Pädagogen. Profile libertärer Pädagogik* Verlag Edition AV: Frankfurt/Main

⁶ Merleau-Ponty, M. (1975) *Fenomenología de la Percepción*. Barcelona: Ediciones 62s/a

⁷ Langenscheidts Großes Schulwörterbuch Lateinisch-Deutsch 1985 Berlin München: Langenscheidt

continental plates and the resulting violent eruptions. However, at the same time, they are places of utopic hopes, conciliation, and peace. (37)⁸ The geo – metaphor and the evoked emotions make emerge the titanic and miraculous work in which we immerse if we understand the pedagogic actions as hybrid possibilities of a performative formation able to set free the forces of an anarchic solidarity.

In addition, Michael Hardt and Antonio Negri (2000) recognize the chiasmic and political power of the concept “hybrid” that consists first in *affirming the multiplicity of the different modes of subverting the power of the binary governing structures.* (125)⁹ But at the same time, they advert that at the beginning of the 21st century exist peripheries in the center and centers in the peripheries because the “Imperium” is *a decentered power device without territory that [...] manages hybrid identities, flexible hierarchies and plural interchanges with the help of modular commanding networks.*(5). We mention these characteristics because the performative intercultural pedagogy (PIP) seeks to form citizens of the hybrid worlds that are able to detect the hybrid logics and to start to play with them in their own way. Therefore, we need to perceive the formative processes with the help of the PIP that parts from the idea that a pedagogic act makes readable and understandable the forms of knowing and competences that come into physical and discursive existence in the daily (school) life.

3. Chiasmic hybridization – a new conceptual-methodological tool in pedagogy

Given the actor-acted and co-constructed, and thus an-archic, character of our conceptual and methodological ontology for formative contexts, we like to prove their durability in the real world. Therefore, we will present in the following part some techniques that illustrate the effects of this hybrid ontology. The following examples try to give an impression of the wide range of learnings/teachings as a result of methodologies that open the way to chiasmic and hybridizing approaches to our realities, having in mind with John Law and John Urry (2003) that

The globalizing world is complex, elusive, ephemeral and unpredictable. It is enacted that way without our help. But if social science is to interfere in the realities of that world, to make a difference, to engage in the ontological politics and to help shape new realities, than it needs tools for understanding and practicing the complex and the elusive. This will be uncomfortable. Novelty is always uncomfortable. (11)¹⁰

3.1. Identity related chiasmic hybridization – co-constructed by students and teachers

3.1.1. Learning to read the (re) binarizations – field diary in a school break. The bell is to ring for the next class on a school day in October of 2006. Some of the nearly 20 students of the ninth grade are seated, others on their way to sit down. One of the last ones shouts “¡Felipe¹¹, ladrón!” (Felipe, thief) Felipe tenses his muscles in his seat, turns around quickly and grunts: “Parcero, no vuelvas a decir eso, por eso me pueden echar del colegio.” (Don’t say this again, for this reason they may throw me out of the school) “Riiiiiiiiiiiiiiiiiiiiing”, rings the bell for the second time. “No más”(No more) says the teacher and the class begins without problems

The next Monday, in the transition between two classes of the same subject, once more you can hear in the same group: “¡Felipi! ¡Felipi! ¡Felipi!” vociferated by male voices out of various corners of the class-room. Felipe gets more tensioned than the last time. “¡Ruhe!”(Silence) imposes the teacher and the class begins.

After the class. The teacher asks Sara a silent student, and Pedro, a happy and sometimes mocking student, to explain the situation. Sara assumes that it is the fault of Felipe for not reacting with more strength and Pedro thinks that it is for what he calls “Felipe’s Asiatic appearance”.

Later, the class teacher explains to the teacher that they call Felipe “Filipi the one from the Philippines”, that he knows about the mocking situation and if it is necessary he would speak with the

⁸ Stanford Friedman, S. (2003): Das Sprechen über Grenzen, Hybridität und Performativität. Kulturtheorie und Identität in den Zwischenräumen der Differenz in *Mittelweg* 36/5 pp. 34-52. Retrieved from www.eurozine.com/article/2003-11-18-friedman-de.html (20.11.2014)

⁹ Hardt, Michael y Negri, A. (2000): *Imperio* Retrieved from <http://www.infojur.ufsc.br/aires/arquivos/Michael%20Hardt%20-%20Antonio%20Negri%20-%20Imperio.pdf> (10.12.2014)

¹⁰ Law John y Urry, John (2003): *Enacting the Social* Department of Sociology and the Centre for Science Studies, Lancaster University, Lancaster LA14YN, UK p.1-19 URL:<http://www.comp.lancs.ac.uk/sociology/papers/Law-Urry-Enacting-the-Social.pdf> (6.12.2014)

¹¹ The name was changed in order to protect the student, at the same time, we pretend to maintain the perturbing “word game” in the group.

group about it. In addition, the teacher who has experienced all the situations is aware that she didn't recognize the phonetic modifications used for bullying the student.¹²

Thanks to the anarchic perception that tries to detect the chiasmic and hybrid properties in our surroundings in order to form solidary identities, we could verify the following facts: the female teacher co-constructed the situation with her ignorance, the class teacher with his passivity, Sara and Pedro with an asymmetrical use of social prejudices. Therefore, we recommend teachers or mediators to take care especially in situations of transition with the help of field diaries in order to detect and transform our condition as acted actors in order to become effective solidary citizens.

3.1.2. Learning from students 'hybridizations – auto ethnography as co-construction. Lala (2014) of 11th grade on the other side is well integrated and her alterity is interpreted as *strange* and *crazy* by her classmates and some teachers, a characteristic that she performs in class in form of simultaneous lack of concentration (mainly painting manga) and very constructive contributions to the discussions. She lived her first years in Belgium, and today, she is interested mostly in her manga paintings after having stopped studying of the Japanese language. In a in depth interview in form of an auto-ethnography that helps us to recognize the "cartography" of our identities¹³, she interchanged her appreciations about language learning that shows hybrid features. When she began to learn German in the Primary School in Colombia, she simply considered German as a dialect of her first language Flemish which hasn't nothing to do, for sure, with Spanish, her mother language. Today, in 11th grade in Colombia, she speaks fluently German, but unlearned a lot of Flemish. At the same time, she perceives more security in the German language than in Spanish, and is very happy if the German language – above all the lectures from the 18th century – shows similarities with Flemish. Every time she perceives certain similarities, she discusses the phonetic and semantic transformations between the two languages with the teacher. The background and the hybrid sense of Lala's linguistic contributions and perceptions could be made learnable by auto-ethnography in form of a three-hour interview, a tool that every teacher should be allowed to use because it facilitates a precious insight in the worldviews and learning accesses of the students.

3.1.3. Daring to live our chiasmic condition in our body – a very real role-play. In April 2013, a teacher was informed that the students had expressed their doubts and uneasiness with her classes. This information caused a deep sadness because it was second hand, so she decided to transform it in an opportunity. The next day, she read in class her position and invited the students to respond her feedback. They agreed and the teacher went out of the classroom. She sat there in the grey morning of April, feeling very puzzled and thinking that this must be the perception of an accused in a courtyard. She even had to wipe away some tears, tears of fear, tears of the doubt of having committed an error. Fifteen minutes later, they called her to come back. She went in to face her judges, fifteen faces looking at her, fifteen persons deciding her destiny as a teacher. They exposed their perceptions and solutions, and already after two minutes, the teacher felt the co-constructive opportunity hidden in the situation. The following months, they cooperated to satisfy the demands of the students, the teacher and the program - and the year ended with a big satisfaction of both sides, including farewell tears – and surprising results in the end exams that resulted better than expected. This role-play as an acted actor was surely a very hard one for the teacher, and at the same time, it demonstrated to be a very anarchic way – with unknown beginning and ending – to create a co-constructive atmosphere.

3.2. Subject related chiasmic hybridization for teachers

3.2.1. The handbook for teachers in the thesis "El Arte de Aprender a Nadar oder die Kunst zu lernen, wie man zwischen zwei Stühlen sitzt" (The Art of learning to be caught in the middle). In the handbook *Una carrera de relevos hacia la pedagogía performativa intercultural* (A relay race to the Performative Intercultural Pedagogy), the author of the thesis and of this article proposes some ways of introducing chiasmic hybrid strategies to the classroom. She offers for example the possibility for language teachers to "*shake the grounds of the textual discourse*", for teachers of social sciences "*to hybridize their concepts*", and for teachers in Primary Schools the possibility to "*hybridize our growing up*". These approaches are available in Spanish and can be translated to English if required.

¹² This situation is available in MacKeldey, A. M. (2010). *El Arte de aprender a nadar entre dos aguas – Die Kunst zu lernen, wie man zwischen zwei Stühlen sitzt*. Doctoral thesis. Medellín: Universidad de Antioquia.

¹³ See Dyson, M. (2007) My story in a Profession of Stories: Auto-Ethnography – an Empowering Methodology for Educators. in *Australian Journal of Teacher Education* Vol 32 No 1 pp.36-48

4. Conclusions

The analysis of possible conceptual and methodological entanglement about the chiasmic and hybrid character of our acts and identity related processes offers new impulse to the pedagogic practice. These stimuli lose their abstract aftertaste if we conceptualize them in the context of the PIP and illustrate them with experiences of the methodological research while developing the PIP, and with the later pedagogical applications and appreciations. Important fields of applications are pedagogical processes related with the pedagogies of sexual orientation, intercultural education and in general, the formative processes of – and about- young Europeans with migrant background who grow up in/between two cultures.

At the same time, we have to emphasize that our concept of anarcho-solidaristic citizens of the worlds does not match with the exaggerated concepts of the ideal, utopic” anarchist that is able to govern himself without any help, and sometimes considered nearly as a “redemption” of humankind. The anarcho-solidaristic citizens of the worlds in the sense of the PIP conceptualize their acting – acted identities with the help of the an-archic no beginning that comes to existence in form of the recognition and application of chiasmic and hybrid co – constructions. This option is hidden in the etymology of “solidaristic” - which is not accepted, i.e. does not exist, as an adjective in many English dictionaries. A hypothetical explanation in harmony with our performative pedagogy of this peculiarity consists in supposing that in the English speaking communities predominate the perception and conceptualization of solidarity as an action, but not as a inherent and acted quality of the actor.

A possible rethinking may arise by the following etymological definition of the German adjective “solidarisch” taken from the German etymological dictionary for students “Schülerduden Wortgeschichte”¹⁴. It explains the French and Latin roots of the concept, and can help to hybridize the English speaking perception of the acting-acted role of a solidaristic person.

19th century, from the French *solidaire* with the same meaning, to Latin *solidus* “echt (real, genuine, sincere)” “fest (strong, tough)” (417). Following the logic of acted actors, we, have to be “echt” “fest” in order to be solidaristic citizens. In addition, at the same time, we have to be solidaristic in order to be “echt” “fest”, that is real, genuine sincere, strong and tough citizens of the worlds. Of this chiasmic interplay that entails a conceptual and methodological hybridization can be taken advantage in the classroom and the learning/teaching processes with the help of the Performative Intercultural Pedagogy.

References

- <http://www.elespectador.com/tags/sergio-urrego> (22.12.2014)
- Folz, J. (1987) *Schülerduden Wortgeschichte: Herkunft und Entwicklung*. Mannheim, Wien, Zürich: Bibliographisches Institut
- Hardt, Michael y Negri, A. (2000): *Imperio* Retrieved from: <http://www.infojur.ufsc.br/aires/arquivos/Michael%20Hardt%20-%20Antonio%20Negri%20-%20Imperio.pdf> (10.12.2014)
- Horowitz Irving, L. (1982) *Los Anarquistas I. La Teoría*. Madrid: Alianza
- Klemm, U. (2002) *Anarchisten als Pädagogen. Profile libertärer Pädagogik* Verlag Edition AV: Frankfurt/Main
- Langenscheidts Großes Schulwörterbuch Lateinisch-Deutsch. (1985) Berlin München: Langenscheidt
- Law John y Urry, John (2003): Enacting the Social Department of Sociology and the Centre for Science Studies, Lancaster University, Lancaster LA14YN, UK p.1-19. Retrieved from: <http://www.comp.lancs.ac.uk/sociology/papers/Law-Urry-Enacting-the-Social.pdf> (6.12.2014)
- Lenzen, M. (22.01.2015) Beitrag Psychologie Heute Radikalisierung ist auch ein Bildungsprozess, *Psychologie heute*, 22.01.2015 Retrieved from <http://bildungsklick.de/a/93027/radikalisierung-ist-auch-ein-bildungsprozess/> (24.01.2015)
- MacKeldey, A. M. (2014) *Auto – ethnographic Interview with Lala Itagüí* (unpublished document)
- MacKeldey, A. M. (2010). *El Arte de aprender a nadar entre dos aguas – Die Kunst zu lernen, wie man zwischen zwei Stühlen sitzt*. Doctoral thesis. Medellín: Universidad de Antioquia.
- Merleau-Ponty, M. (1975) *Fenomenología de la Percepción*. Barcelona: Ediciones 62s/a
- Stanford Friedman, S. (2003): Das Sprechen über Grenzen, Hybridität und Performativität. Kulturtheorie und Identität in den Zwischenräumen der Differenz in *Mittelweg* 36/5 pp. 34-52. Retrieved from www.eurozine.com/article/2003-11-18-friedman-de.html (20.11.2014)

¹⁴ Folz, J. (1987) *Schülerduden Wortgeschichte: Herkunft und Entwicklung*. Mannheim, Wien, Zürich: Bibliographisches Institut

PROVIDING LECTURERS WITH INFORMATION ABOUT ECO-FRIENDLY TRANSPORT VIA AN INFORMATION PLATFORM

Lisa-Maria Putz & Alexandra Haller

Logistikum – Transport Logistics & Mobility, University of Applied Sciences Upper Austria (Austria)

Abstract

The transport of goods is a substantial part of worldwide progress, globalization and hence welfare and economic growth. In fact, economic growth (GDP) and the volume of freight transport generally are very closely related which means that if GDP increases, the volume of freight transport grows. In Europe around 75% of freight transports are done by truck. The overall amount of freight transport is constantly increasing, which leads to numerous negative externalities such as greenhouse gas emissions, noise or accidents. Nevertheless, people are lacking information as well as knowledge about eco-friendly transport alternatives such as railway and inland waterway. One reason for this lack of knowledge might be the missing integration of eco-friendly transport in curricula and an access to reliable information.

Aim of this paper is to demonstrate how an information platform about eco-friendly transport modes has been established to provide reliable information and a simple access to this information. Readers, PowerPoint presentations, exercises, videos or learn packages for different levels can be found on this information platform. In addition, companies and its programs for excursions are introduced and contact details for future excursions provided.

The qualitative study of this research has been conducted as follows: In a first step, a literature review was conducted to identify key enablers for an information platform. Afterwards, the result was discussed in a focus group with specialists of IT, didactics and logistics. Based on the literature review and the focus group, the information platform was developed. During this process experts on education and didactic methods were regularly integrated to receive feedback about structure and contents and ensure a high level of usability for this target group.

Results suggest that the information platform must be easy accessible. In fact, a responsive web design, which adapts the layout of the platform due to the devices (tablets, smart phones, PCs) used, represents a basic requirement. In addition, the experts claimed to abandon log-in procedures. Another key enabler is the open source availability of the materials/contents since lecturers want to be sure that using the contents is legally accepted. Due to ongoing debates about user integration and contribution, an information platform should integrate its users by the possibility to give feedback (i.e. give comments) or share on social media channels. Another big issue is to inform lecturers about the new information platform and integrate the platform in an overall train-the-trainer concept. This concept is based on online/distant learning and/or presence events.

Keywords: *Logistics Education, ICT, eco-friendly transport, information platform.*

1. Introduction

The transport of goods is a substantial part of worldwide progress, globalization and hence welfare and economic growth. In fact, economic growth (GDP) and the volume of freight transport generally are very closely related which means that if GDP increases, the volume of freight transport grows. Thus, a growth of GDP, which is commonly considered positively and as necessary for a societies' sustainable development, induces an increase of external costs due to the higher amount of freight transport. External costs are costs which arise e.g. from emissions or accidents and are not included in the prices which are paid for a transport. The average annual growth rate of the GDP in EU-27 countries was 1.9% p.a. between 1995 and 2011. In comparison, the annual growth rate for freight transport within the same time frame was 1.4% p.a. (European Commission, 2013).

Even if road transport is not considered as an eco-friendly transport mode for freight transport, in Europe 75.1% of freight transports in EU-28 were done by truck in 2012. Indeed, only 6.7% were transported using inland waterways and 18.2% using railways (European Union, 2014). The overall

amount of freight transport has been constantly increasing, which leads to numerous negative externalities such as greenhouse gas emissions, noise or accidents. In fact, negative externalities are paid with people's health and not by the parties which are responsible for it (i.e. companies). Since a further increase of worldwide freight volume is expected, negative externalities will continue to accrue. Sustainable transport systems which enhance the use of eco-friendly freight transport are seen as an important measure to mitigate those negative externalities (Rohács & Simongáti, 2007), (European Union, 2011). Railway and inland waterway transport are generally evaluated as more environmentally friendly transport modes than road transport. In fact, those transport modes produce less external costs than road transport. In addition, inland waterway transport is considered as the most eco-friendly transport mode for freight in Europe (European Commission, 2013).

A continuing worldwide increase in freight transport is expected which results in a growing of emissions. In order to decrease negative effects of transportation, the European Union (EU) needs to cut emissions for the transport sector of 60% by 2050. This goal has to be achieved in spite of an overall increase in transport volume. Therefore, a modal shift to more eco-friendly transport systems, such as railway and inland waterway is strongly supported to reach this emission reduction goal (European Union, 2011). Besides hard measures (e.g. investments in infrastructure or fiscal grants) soft measures are equally needed to support the efficiency of hard actions and reach to emission reduction goal. Soft measures inform or educate people and thus, create knowledge, understanding and awareness for specific topics such as environmental friendly behavior.

Nevertheless, people are lacking information as well as knowledge about eco-friendly transport alternatives such as railway and inland waterway. One reason for this lack of knowledge might be the missing integration of eco-friendly transport in curricula and insufficient reliable information. Previous research demonstrates that inland waterway and railway transport are hardly discussed in logistics education. Indeed, learning about (freight) transport modes is generally focused on road and maritime transport (Breinbauer, et al., 2012; Putz & Schauer, 2013).

The eco-friendly transport modes inland waterway and railway require a higher systematic understanding of logistics processes compared to road transport. In fact, organizing multimodal transport chains with eco-friendly transport modes is generally more complex since (in most cases e.g. no direct access to a port or railway connection) pre- and end-haulage and thus, transshipment of goods are necessary. As a result, students' full involvement in the learning process is needed to grasp an understanding of the overall system (Dolinsek et al, 2013).

2. Objectives and Methodology

Aim of this paper is to demonstrate how an information platform about eco-friendly transport modes has been established to create reliable information and a simple access to this content. The ARCS Model (Attention Relevance Confidence Satisfaction) which was developed by Keller and Kopp in 1987 was used as a guideline for the development of the information platform (Keller, 1983) (Hillsdale, Keller, & Kopp, 1987). Readers, PowerPoint presentations, exercises, videos and learning packages for different levels represent only a few offers which will be provided on this information platform.

A qualitative research approach was conducted for the development of the information platform. In a first step, a literature review was conducted to identify key enablers for successful implementation. Afterwards, the result was discussed in a focus group with specialists of information systems, didactics and logistics. Based on the literature review and the focus group, a first version of the information platform was conducted. During this process experts on education and didactic methods were regularly integrated to receive feedback about structure and contents to ensure a high level of usability for this target group. The received feedback from the expert had been used for a further development of the platform. As a future step, teachers, professors, the industry and students will be invited for a focus group to discuss the contents and usability of the information platform.

The development of this information platform is part of the education cooperation REWWay (Research and Education in Inland Waterway Logistics) between viadonau and our University which was established in 2012. Goal of REWWay is to integrate inland navigation - with a focus on Danube navigation- into logistics education and training in order to raise acceptance of the Danube as environmentally friendly way of transport. This will be achieved by a development of high quality and up-to-date teaching material.

3. Key Enablers for an information platform on eco-friendly transport

Based on the previously conducted qualitative research three main success factors for a successful implementation of an information platform were identified. The provided information must be

open content, the information platform must have a high level of usability, contents must be easily adaptable and networking functions to connect educational institutions and the industry must be available. The information platform offers various different types of teaching material such as PowerPoints, scripts, short films, exercises/solutions, case studies and serious games. To facilitate and support teaching stuff with the integration of the content into the classroom, pre-fabricated learning packages consisting will be additionally available. The ARCS Model (Attention Relevance Confidence Satisfaction) which was developed by Keller and Kopp in 1987 was used as a guideline for the development of the information platform. The four letters are necessary requirements for a successful implementation of an e-learning platform (Keller, 1983) (Hillsdale, Keller, & Kopp, 1987).

Figure 1. Current Example of a Learning Package (Information Platform has not been finished yet)

The screenshot displays the REWWay website interface. At the top, the logo 'REWWay' is visible, along with a search bar and navigation links: 'Teaching materials', 'Services', 'About', and 'Research'. The main heading is 'Teaching materials > The Danube Waterway - Economic Geography'. Below this, there is a large image of a river with a boat. To the right of the image, a text box describes the learning package: 'The learning package "The Danube Waterway - Economic Geography" consists of slides, a reader and a film with fitting exercises and solution and contains geographical and economic geographical information about the Danube corridor and compares the Danube with the Rhine.'

Below the image, there are three download sections:

- Download**
The Danube Waterway - Economic Geography - Slides
This set of slides contains geographical and economic geographical information about the Danube corridor and compares the Danube with the Rhine.
1600, 12.7 MB
- Download**
The Danube Waterway - Economic Geography - Reader
The document provides you with additional information on the set of slides "The Danube Waterway - Economic Geography" and contains geographical and economic geographical information about the Danube corridor and compares the Danube with the Rhine.
2000, 4.7 MB
- Download**
Film: Charting the course: Marco Polo supports Europe's inland waterways
Marco Polo (II) is a programme of the European Union which financially supports innovative projects to shift traffic and transport from road to rail and inland waterway. Apart from general information the video shows some practical examples of inland waterway and presents the Marco Polo project.
1000, 722.0 MB
Solution for every bar
900, 24.12 MB

At the bottom, there is a video player titled 'Charting the course: Marco Polo supports Europe's inland waterways' showing a river scene with a boat. Below the video player, there is a blue box with the text: 'Frequently asked questions' and 'Inland waterway transport as environmentally friendly way of carrying goods?'

Figure 1 demonstrates an example for a pre-fabricated learning package for the topic of ‘The Danube Waterway – Economic Geography’. For this package PowerPoint Slides (which can easily be adapted from the teaching stuff), a reader and a film with exercises and solutions are given. Other learning packages include e.g. case studies, links to more detailed references, games or quizzes.

3.1. Usability & Open Content: To Reduce Barriers

The usability or user-friendliness of the platform but also of the teaching materials itself are important success factors for the information platform. Results suggest that the information platform must be easy accessible. In fact, a responsive web design, which adapts the layout of the platform due to the devices (tablets, smart phones, PCs) used, represents a basic requirement.

The teaching material must be effortlessly to use and target group oriented. The content must be developed to meet the target group’s requirements. Therefore, different levels of teaching materials had been developed to cover a wide range of the target group (Ehlers, 2009). All content developed within the project is available under a creative common license. Creative common license means that users are free to use, adapt and share the provided content. Thus, they are able to adapt the material to their special needs for example make changes in order to time limitations, target groups or to set their desired emphasis. By giving users the permission to share the content without limitation the goal of addressing a broad public is additionally fostered (Creative Commons, 2015). In fact, due to legal claims in terms of copyright the issue of using material from other websites represents a strong barrier for the stakeholders which makes it even more essential to offer the learning material as creative commons. In addition, the experts claimed to abandon log-in procedures. Due to ongoing debates about user integration and contribution, an information platform should integrate its users by the possibility to give feedback (i.e. give comments) or share on social media channels in order to meet the requirement for higher user involvement (Ehlers, 2009).

3.2. International focus and connection between industry & educational sector

Inland waterway transport commonly takes place across borders since it is only economically efficient if transport distance is longer than 300 kilometres. Hence, it is of high importance to support people from different countries and thus, the teaching offers and the information platform must be internationally usable. The materials and the platform will be in German and English and must be adapted to country-specific issues.

Logistics as a scientific field is strongly characterized by its strong connection with the industry. In fact, research in logistics is intensely driven by industry and thus, very dynamic. Within logistics education it is important to enable students to get insight into the practice (van Hoek, 2001) (Gravier & Farris, 2008). By collecting and offering excursions, guest lectures and success stories a joint network between the industry, the educational sector and the research sector shall arise.

In order to enhance the connection between industry and the educational sector, companies and its programs for excursions are introduced and contact details for future excursions provided. All parties will make benefits of this cooperation since the industry will be able to get in contact with possible future employees and students can combine theoretical knowledge with practical experience. Portraits and brief descriptions of people which can be contacted for free external lecturers are presented on the platform. In addition, case studies on different levels which have been developed with the industry and university professors can be found on the information platform. Those case studies are based on real transport or emission problems which are faced by the companies. Success stories or best practice examples, such as a transport of windmills by an inland vessel, are presented to support users in getting a better understanding of the numerous deployments of eco-friendly transport modes in the supply chain. In future, the platform will act as a network which will support joint projects and thus, enhance national and internal networking between educational institutions, economy and research.

3.3. Implementation

The information platform will be finished early 2015 and will be presented to the stakeholders within a networking event in April 2015. The event will be organized to bring together the various stakeholders of the information platform: research, industry, students and educational staff. Ongoing dissemination activities, such as presentations at schools or conference participation will enhance international publicity. This will support the overall aim of REWWay to promote inland waterway transport, to establish it into logistics education and to foster the integration of inland vessels into the transport chain. Another big issue is to inform lecturers about the new information platform and integrate the platform in an overall train-the-trainer concept (López-Borrull, 2014). This concept is based on online/distant learning and/or presence events. For the future, a further development of the information platform towards a living network is aimed.

References

- Breinbauer, A. B., Forhinger, A., Fritz, M., Herry, M., Kummer, S., & al., e. (2012). *Empfehlungen für eine nachhaltige AUs- und Weiterbildung im Intermodalen Güterverkehr*. Wien: Logotrans Logistik- und Transport-Consult GesmbH.
- Creative Commons. (2015, 01 10). *What is Creative Commons?* Retrieved from Creative Commons: <http://creativecommons.org/about>
- Dolinsek et al. (2013). *Manual on Danube Navigation*. Wien: bmvit.
- Ehlers, U. (2009). Web 2.0 - E-Learning 2.0? Quality for New Learning Cultures. . *Quality Assurance in Education* 17 (3), 296-314.
- European Commission. (2013, 01 21). *Inland Waterways*. Retrieved 01 07, 2015, from European Commission: http://ec.europa.eu/transport/modes/inland/index_en.htm
- European Commission. (2013). *Statistical Pocketbook 2013*. Luxemburg: Publications Office of the European Union.
- European Union. (2011). *White Paper 'Roadmap to a single European transport area — Towards a competitive and resource-efficient transport system' (COM (2011) 144 final of 28 March 2011)*. Luxembourg: Publications Office of the European Union.
- European Union. (2014, 12 10). *Eurostat*. Retrieved 01 07, 2015, from Modal Split of Freight Transport: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=tran_hv_frmod&lang=en
- Gravier, M., & Farris, M. (2008). An Analysis of Logistics Pedagogical literature. Past and Future Trends in Curriculum, Content, Pedagogy. . *The International Journal of Logistics Management* 19 (2), 233-253.
- Hillsdale, N. E., Keller, J., & Kopp, T. (1987). An application of the ARCS model of motivational design. In C. In Reigeluth, *Instructional theories in action. Lessons illustrating selected theories and models* (pp. 289-320). Hillsdale, NJ: Erlbaum.
- Keller, J. (1983). Motivational design of instruction. . In C. Reigeluth, *Instructional design theories and models. An overview of their current studies*. (pp. 383-434). New York: Lawrence Erlbaum Associates.
- López-Borrull, A. (2014). Prom-Open: Promoting Open Science in an On-Line E-Learning Environment. *Proceedings of EDULEARN Conference*, (pp. 2200-2206). Barcelona.
- Putz, L., & Schauer, O. (2013). Demands concerning Educational Media: Integration of eco-friendly Transport in Education and Training in Austria. *EISTA*. Florida.
- Rohács, J., & Simongáti, G. (2007). The Role of Inland Waterway Navigation in a Sustainable Transport System. *Transport* 22 (3), 148-153.
- van Hoek, R. (2001). Logistics education: Achieving market and research driven skill development. *International Journal of Physical Distribution & Logistics Management* 31, 7/8, 505-519.

THE USE OF E-LEARNING TECHNOLOGY FOR COMMUNITY-BASED TEACHING IN MEDICAL SCHOOLS

Carmen Patricia Obando¹ & Geraud Plantegenest²

¹*Department of Obstetrics, Gynecology and Reproductive Biology. College of Human Medicine. Michigan State University (United States)*

²*Office of Medical Education, Research and Development, College of Human Medicine, Michigan State University (United States)*

Abstract

Justification:

The standardization and delivery of the academic curriculum becomes intricate and difficult to assess with the increased number of medical students across schools. The department of Obstetrics and Gynecology is part of a community-based college with six different campuses across the state. Every community is unique in regards to population, number of preceptors, type of clinical cases, etc. Because of this diversity, the standardized delivery of required lectures across communities has been difficult. It was precisely this need that led us to create an online lecture system so that all students, no matter their location, could have access to the same content and number of lectures. A total of 19 online lectures were created and delivered to all students through an online platform. Students were required to complete a survey to evaluate their feedback on the usefulness of the modules as didactic tool.

Objectives:

To evaluate the students' feedback on the usefulness of standardized online lectures in their rotations, allowing for the standardization of content and delivery across communities.

Methodology:

A total of 19 core lectures were created using interactive online modules for each topic. Each module was developed using the same formatting with nine key components: introduction, definition, pathophysiology, differential diagnosis, procedures, psychosocial dimension, epidemiology, clinical cases and a summary. A combination of text, images, short videos, three clinical cases and a quiz to evaluate the student performance was used for each module. After completion of all lectures, the student was required to complete an 18 question final survey on the use of the online modules as part of their didactics.

Results and conclusions:

Data from the 2013 and 2014 survey was analyzed to gather student's feedback on the content, delivery, and satisfaction on the use of the modules as a didactic tool from a total of 191 students. Over 60% of the students agreed the online lectures are as effective as the in-class ones. Clinical cases included were considered well thought and helpful, building student's confidence in the subject. The multimedia component and the ability to review the modules any time helped the students improve their learning process. There are significant differences ($p=.05$) between rotations as students have more positive feedback towards the end of the year. The implementation of online lectures for medical students proves to be an effective teaching tool.

Keywords: *Obstetrics, Gynecology, e-Learning, online modules.*

1. Introduction

As medical schools continue to grow and expand, schools and teachers are becoming more inclined to implement an online curriculum to deliver didactics content, sometimes in combination with face-to-face time (Chao et al, 2012). Space and few human resources to satisfy the growing demand in medical schools, are some of the factors involved in the implementation of a blended learning methodology. As we move forward with the availability of online and blended resources, there is more literature evaluating the impact of online lectures vs. live lectures. Some evidence shows blended resources are more effective than live lectures, while others indicate both resources are equally efficient

(Rowe et al, 2012; Halbert et al, 2011; Shaw et al, 2011). In clinical education, blended education has shown to improve certain clinical competencies in medical students (Rowe et al, 2012) such as improvement of reflective skills, clinical reasoning and better understanding of theoretical basis to practice. The effectiveness of online lectures on student's knowledge is also affected by student's learning style and motivation (Nieder et al, 2011) as some students are more inclined to visual learning than others. There is also a positive impact on non-native English speakers in medical schools with an overall improved performance (Graham et al, 2011) in their test scores compared to traditional teaching methods.

Evidence indicates that online teaching is effective and we should be able to offer a self-paced teaching and learning method to keep up with our students' new learning style and be able to engage them into a more dynamic learning environment (Probe and Heath, 2012). The majority of the literature evaluates the impact of blended education, but few of them show the student's point of view on the implementation of online learning in higher learning education. This study aims to evaluate student feedback and satisfaction regarding the use of online lectures vs. live lectures during their Obstetrics and Gynecology rotation in their third year of medical school.

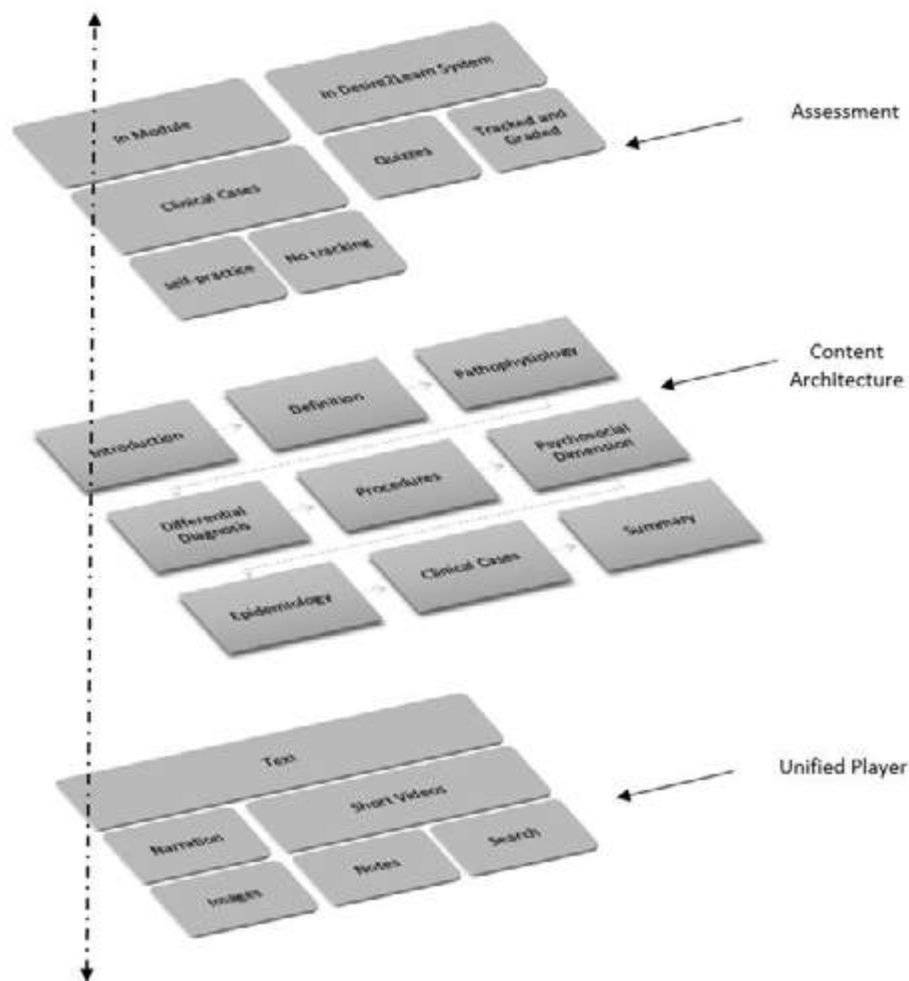
2. Design

A total of 19 online core modules or online lectures were developed to complement the required didactics for third year medical students going through the Obstetrics and Gynecology rotation. All online modules are delivered through Desire2Learn, a learning platform system where students log in using their student ID information. All modules are available to students 24 hours a day in the website. The following are the current module topics (online lectures) available to the students: Normal obstetrics and prenatal evaluation, First trimester bleeding, Preterm labor, Fetal heart monitoring, Ovarian neoplasms, Infertility, Menopause management, Complications of pregnancy-Pre-Eclampsia, Endometriosis, Complications of pregnancy-Diabetes Mellitus, Cervical screening and Abnormal pap smears, Postpartum hemorrhage, Polycystic ovarian syndrome and Hirsutism, Sexually transmitted diseases, Abnormal uterine bleeding, Contraception, Endometrial cancer and postmenopausal bleeding, Third trimester bleeding, Amenorrhea and Vaginitis.

Each module follows the same interactive content structure by including nine key major components: Introduction, definition, pathophysiology, differential diagnosis, procedures, psychosocial dimension, epidemiology, three clinical cases, a summary and a quiz. A combination of text, narration, images, and short videos were used in each module. The content delivery format supports HTML 5, Flash, and mobile devices which offers the learners the flexibility to view content wherever they are: desktops, laptops, tablets, and more. The learner experience is facilitated thru a highly customizable and unified player that combines all content in a consolidated interface, thus allowing users to access the module content in different modalities (e.g., Outline, thumbnails, slide notes, and search function). Figure 1 shows a visual map demonstrating how all different components are integrated into the final design of the module.

After completing the module, the student is required to complete a final evaluation on the module regarding satisfaction, quality of the topic, learning objectives, most and least useful components and overall effectiveness. The survey is available through Desire2Learn, an integrated learning platform used by the College of Human Medicine. Only registered students can have access to the system using their university ID and username. The final evaluation includes a total of 18 questions; combining open questions with Yes/No answers and Likert scale questions.

Figure 1. E-learning Module Visual Map Integrating Unified Player, Content Architecture and Assessment Layers for Each Module.



3. Objectives

The aim of this project is to evaluate the students' feedback on the usefulness of standardized online lectures in their rotations. The implementation of online required lectures allows for the standardization of content and delivery across six community-based campuses. All communities are spread out across the state of Michigan and some of them have few faculty/clinical resources to deliver all required lectures during the student rotation. The use of blended resources have provided great relief to communities, freeing human resources and at the same time, making sure all students receive the same number and quality of lectures regardless of where they are located. Students are allowed the first two weeks of the rotation to complete the lectures and the evaluations, and modules can be reviewed from home or from any other place they wish to do it.

4. Methods

For the data analysis, a total of 191 responses were gathered from Fall I 2013 to Fall I 2014 which includes a total of seven 8-week rotations in Obstetrics and Gynecology. The survey includes a total of 18 questions out of which two are Likert scale, eight are Yes/No answers, and five are open questions. Qualitative data regarding student feedback was analyzed using WordItOut to highlight the most important words from student's comments. Descriptive analysis was done using Microsoft Excel 10.

Table 1 summarizes the questions and available responses included in the final evaluation:

Table 1. Core lectures/modules evaluation questionnaire

Questions	Answer type
1-Select your community	Flint, Grand Rapids, Lansing, Midland, Traverse City, Midland
2-Rate the overall quality of the lectures:	5-Excellent 4-Above average 3-Average 2-Below average 1-Poor
3-Learning objectives of each online lecture were clearly stated:	Yes/No
4-How does the quality of the online lectures compare with your expectations about it?	5-Well below what I expected 4-Somewhat below what I expected 3-Same as expected 2-Above what I expected 1-Well above what I expected
5-The clinical cases included in the modules were well thought and helpful	Yes/No
6-The module helped me feel more confident in the subject	Yes/No
7-What part of the modules did you find most useful?	Comment
8-What part of the module did you find least useful?	Comment
9-The multimedia (audio, video and animation) materials promoted my learning	Yes/No
10-If not, why?	Comment
11-Do you feel the online lecture is as effective as having in-class lectures?	Yes/No
12-If not, why?	Comment
13-Did the ability to review or view the online lecture more than once and at any time of your liking aid you in the learning process?	Yes/No
14-Did questions from watching the lecture get answered by your preceptor or Clerkship Director?	Yes/No
15-Did you have any difficulty accessing the lectures?	Yes/No
Explain:	Comment
17-If yes, did the issues get resolved?	Yes/No
18-Where did you view the lectures?	Home, Campus, Hospital, Other

5. Results

Overall, 54% of the answers came from the Grand Rapids community, followed by Lansing (27.3%) and Flint (18.2%). Communities such as Traverse City, Midland and Marquette have on average 2 students per rotation, and rotations do not occur all year round. Sixty-six percent of the students indicated the online modules were as effective as having an in-class lecture, and 85% of them agreed the learning objectives were clearly stated for each module. When asked to rate the overall quality of the lectures, over 50% indicated the lectures were average and between 26% and 33% thought they were above average. The same pattern was observed across lecture type, regardless of the timing of the rotation. Similarly, over 50% felt their expectations about the lecture were as expected, while 30% thought the quality of the modules were above what they expected.

Regarding the clinical cases included in each module, most students (78.8%) felt the cases were well thought and helpful. Overall, students indicated the modules helped them to feel more confident in the subject (67.7%), and the ability to review the modules more than once at any time helped them in their learning process (80.7%). Most students specified the multimedia aspect of the modules such as audio, video and animation promoted their learning (77.7%). Questions from watching the modules got answered by their Clerkship Director or preceptor for the most part (76.8%), and had no difficulty accessing the online modules (72.8%). Positive feedback from the students increases significantly towards the end of the academic year, $p=.05$

Among the features students found most useful were the clinical cases, the quizzes upon completion of the module, diagrams and charts, videos, organization of the module, the interactivity of the module, the ability to pick and choose from the module, the diversity of topics, and being able to review over and over the different components of the module. Less useful aspects of the module were the timeframe given to students to complete all modules, technical difficulties loading the videos, and no

interaction with the preceptor. Some students found the modules to be dry, not interesting, unnecessary and lengthy.

Over 70% of the students watched the modules from home and the rest from campus.

6. Conclusions and Discussion

The creation and implementation of online learning modules to replace live lectures has proved to be beneficial for the program. Large and standardized content for nineteen Ob/Gyn topics are available to students and faculty at all times. The ability to review and pause proves to be a positive detail of the modules, as well as the clinical cases with video and quizzes. Although the use of online learning material is becoming more available in high learning education, it is important to complement the delivery of knowledge with live discussion and group sessions.

Live interaction still provides an opportunity for students to ask questions and get immediate feedback on any clinical issue. We suggest that any implementation of e-learning content should be complemented with live group discussions as an opportunity for students to clear any doubts from the lectures. Online learning resources also need maintenance in the sense of updating content and formatting to keep it current and interesting to the students.

References

- Chao SH, Brett B, Wiecha JM, Norton LE and Levine SA. 2012. Use of an online curriculum to teach Delirium to fourth-year medical students: A comparison with lecture format. *Journal of the American Geriatric Society*. 60:1328-1332.
- Halbert C, Kriebel R, Cuzzolino R, Coughlin P and Fresa-Dillon K. 2011. Self-assessed learning style correlates to use of supplemental learning materials in an online course management system. *Medical Teacher*. 33:331-333.
- Nieder GL, Borges NJ and Pearson JC. 2011. Medical student use of online lectures: Exam performance, learning styles, achievement motivation and gender. *Medical Science Educator. The Journal of the International Association of Medical Science Educators*. 21(3):222-228.
- Prober CG and Heath C. 2012. Lecture halls without lectures- A proposal for medical education. *The New England Journal of Medicine*. 366:18
- Rowe M, Frantz J and Bozalek V. 2012. The role of blended learning in the clinical education of healthcare students: A systematic review. *Medical Teacher*. 34:e216-e221.
- Shaw GP and Molnar D. 2011. Non-native English language speakers benefit most from the use of lecture capture in medical school. *Biochemistry and Molecular Biology Education*./ 39(6):416-420.

GAMIFICATION FOR ENERGY PROFILE MODIFICATION

**Aphrodite Ktena¹, Enea Mele^{1,2}, Eugenia Tsalkitzi²,
Charalambos Elias¹ & Christos Manasis¹**

¹*Department of Electrical Engineering, TEI of Sterea Ellada (Greece)*

²*SAICON (Greece)*

Abstract

The ever present problem of energy resource management, the increasing energy needs of our civilization and the technological trends in electricity grids converge in the need for demand side management. For the latter to be successful, the energy users must be retrained to interact with the grid and actively manage the energy consumption of devices and buildings they use towards zero energy buildings and a low carbon emissions economy. For this purpose, an application was created, intended for use in tablets, PCs or mobile phones by any adult user regardless of race, gender, education, economic level, profession or social level. ‘Smartege’ was developed based on a novel methodology which combines cognitive learning and gamification mechanics to educate energy users in electrical energy consumption, production, and control technologies on the one hand, and engage them in energy saving behavior, techniques and technologies, on the other. Following the cognitive process, the students/users, shift from being passive recipients to active players interacting with the application’s environment, adding meaning to the relevant procedure they attempt to understand and finally conquering it. As the users advance in the game, they unlock different levels, which correspond to the energy management of buildings of increasing complexity, learning the basics of electricity use and markets, making decisions on energy production and saving strategies, being rewarded for their progress, offered assistance to evolve or encouraged to try harder when trailing behind. To engage users in the learning process, gamification mechanics such as badges, leaderboards, levels, quizzes, counters and social interaction are used. The aforementioned have proved to raise users’ interaction with the game, enabling them to signal their achievements to other players and compete for knowledge thus enhancing fair competition within the game.

Keywords: *Energy saving, electricity user profile, modification of energy behavior, zero energy buildings*

1. Introduction

Technology goes hand in hand with the history of mankind and the evolution of human species as it spans all activities and objects developed by the mankind. Given the rapid changes in technology, the general public is often suffering from technological illiteracy which leads to alienation, disenchantment with technology, misinformation and manipulation.

Technological literacy is not merely about using computers or searching the Web for information and data. It is about knowledge, skills and ways of thinking and acting so that people are allowed to interact with and participate in the world around them, in an intelligent and thoughtful manner. A technologically literate person realizes the pervasiveness of technology, is familiar with the basic concepts important to technology, knows about the engineering design process, understands that there are trade-offs, capabilities and limitations involved in any system; recognizes the dialectic relationship between technology and society, understands there are risks, costs and benefits involved with any technology, interacts better with the world around them, is capable of improving one’s life by solving simple problems, participates actively in decision making processes concerning technological solutions (Pearson & Young, 2002).

Over the last two decades, a lot have changed in electricity grids and markets. The state-owned electricity monopolies of the 20th century that made possible the electrification of the developed world are being dismantled to allow for the advent of the competitive electricity markets promising to incorporate existing and novel technologies such as distributed generation and renewable energy sources (RES), pervasive sensing and smart grids, two-way real-time communication between electricity provider

and electricity user, active and passive user control of electricity use, intra-day variation of the electricity unit cost (kWh). These dramatic changes come at a time where energy efficiency and a shift towards a low carbon economy rank high in the agenda of EU as well as other developed countries. The new paradigm calls for an educated electricity user who will be able to read and understand his/her electricity bill, monitor and control his/her consumption profile, intervene in the electricity market by buying or selling (micro-generated) electricity at competitive prices, understand the idea and contribute in realizing net zero energy buildings (nZEB). The importance of literacy in energy related matters is revealing in the case of the energy crisis in California, USA, in the late nineties which followed the deregulation of wholesale and retail electricity markets and might have been prevented or subdued if both legislators and consumers were better informed about the structure of the California electrical energy grid and market and therefore in a better position to calculate the repercussions of the proposed changes and the required shift in their individual and collective stance on the matter (Pearson et al, 2002)

Gamification is a promising educational methodology which can be combined with behavioral modification. Gamification, coming from the field of digital media, first appeared in 2008 (Deterding *et al.*, 2011), but became widely known in mid-2010. In view of the current applications of gamification and the different interpretations that have been given, the definitions given vary and are directly related to the practices used. As a relatively new concept, it has been a controversial topic, especially concerning its application in the educational process, but has already been applied in many educational environments such as e-learning platforms, or as a teaching method, as well as in commercial applications in order to emotionally commit and engage users (Dominguez, *et al.*, 2013; McCombs and Vakili, 2005; Lee and Hammer, 2011).

The gamified application proposed in this work does not intend to replace conventional teaching methods, nor be a commercial application for attracting users - clients. 'Smartege' aims at combining the educational and commercial potential of gamification, in a new application development methodology that will lead the users, through education and increased involvement, to engage in activities and actions associated with electricity consumption, production and energy saving that they will perform on a daily basis. The ultimate goal is to engage the student/user and make them interact with a community in which inevitably they will negotiate with their cultural environment, traditions, history and customs and will be triggered to adjust their behavior and assume roles that will make them conquer the basic as well as overall concept of the subject in question.

2. Methodology

The methodology underlying 'Smartege' is based on Fogg's behavior model (FBM) according to which, for a person to be convinced to change his behavior on an issue, three conditions must apply: 1) sufficient motivation 2) appropriate ability 3) efficient and timely triggering (Fogg, 2009).

The behavior trajectory $B(t)$ of an individual on a given issue as a function of time t , is a function of two time-varying quantities, motivation $M(t)$ and ability $A(t)$, and discrete triggering events $T(t)$ facilitating the shift of an individual's behavior: $B(t)=f(M,A,T)$

At any given instant t_i , the behavior exhibited by an individual B_i corresponds to a given level of ability A_i , ie knowledge or skill on the issue in question, and a given level of motivation, desire to modify one's behavior on this issue, M_i .

To persuade an individual to modify his/her behavior on an issue, through some intervention technique, and shift from B_i to B_{i+1} , appropriate triggering T_{i+1} must be applied at instant $t=i+1$ when the controls M and A are such that $M_{i+1} \geq B(A_{i+1})$. In plain terms, the individual is more likely to implement change when being *triggered* at the time that he/she is sufficiently *motivated* for the level of *ability* required to implement the said change.

In our application, the target is to facilitate electricity users shift from being passive consumers in the conventional supply side management electricity grid and market paradigm to being active agents in the emerging demand side management grid and deregulated electricity markets. To accomplish that, 'Smartege' relies heavily on its educational component intended to inform, educate and train users on the basics of electricity generation, distribution, consumption and saving.

The educational content, designed to increase the ability A of users, is based on the cognitive learning model where the student from passive knowledge receiver becomes an active partner in the process, employing actions, rational thinking, and interaction with others and the environment, in an effort to give meaning to the subject matter that he/she attempts to understand or conquer. Making meaning resolves the contradiction between what we know with certainty and what we think that others know on the one hand and what else we want to know or what we think we should know on the other (Wiltshire, 1990). In this content, the acquisition of knowledge becomes a personal affair of the subject, defined and targeted by it. Mind and behavior coincide just like action and perception. Cognitive learning

follows the learning pyramid of six consecutive levels (Bloom et al, 1956): know, understand, apply, analyze, evaluate, create.

Gamification mechanics are employed according to the flow model (Csikszentmihalyi, 2000) in motivation increase and triggering. The motivation level M is raised employing all three FBM motivator dipoles, namely, pleasure/pain, hope/fear, social acceptance/rejection (Fogg, 2009) and triggering T implements all three types suggested by FBM, namely, sparks, facilitators and signals.

In games, the user's engagement with the game diminishes as the game approaches its end, while in gamified applications, the mechanisms that make the game engaging are used to increase user involvement in the course of time. Most existing energy related games or gamified applications aim at raising ecological awareness at relatively young ages. 'Smartege', on the other hand, aims not only at educating or entertaining but also modifying the electrical energy behavior of users, who belong in older age groups and have left basic education behind. The proposed application is at the same time a game of simulation, because it simulates the consumption and production of electricity based on actual building requirements (residential or professional); strategy, because it requires the user to set objectives and use optimally the tools and resources provided to him; learning & training, because there is diverse material provided for the user's training to electricity basics and use; quizzes, because many of the 'tasks' of the application are multiple choice questions based on the learning & training material.

3. Designing the application

The application's content addresses the cognitive, emotional and social area of the user (Constantos et al, 2014). The cognitive content is structured following Bloom's taxonomy (Bloom et al, 1956) starting from simple definitions and tips and escalating to more complex explanations and tasks requiring deeper understanding and insight. Feedback is continuously given in the form of points earned from accomplishing a task such as reading suggested material, answering a quiz, solving an exercise which can be redeemed in electrical energy upgrading of the building managed by the user and unlocking higher levels. The user may create his/her individual path to the top, selecting the specific objectives and activities offered.

The emotional content employs counters, badges (Figure 1) and awards to motivate the user and appropriate triggering based on the three dipole FBM motivators. The 'Smartege' user is expected to experience positive emotions such as curiosity, satisfaction, optimism as well as negative ones such as frustration and failure. Using game mechanics such as levels, rewards, leaderboards and missions we seek to transform the negative emotions to positive ones such as succeeding thus keeping the user in the 'flow' zone of, or emotionally engaged to, the game. The 'Smartege' leaderboard is called 'Tesla's Followers' (Figure 2) and the user's ranking in it depends on the points earned though the progress of the game. The leaderboard also appeals to the social area of the user.

Figure 1. Indicative Smartege badges: The Effective, the Newcomer, Gone... with the wind



Figure 2. TESLA's Followers: the Smartege leaderboard



The social content includes missions and tasks intended to shape the social profile of the application user, to form an identity, by triggering him to invite friends, share knowledge and tips, perform actions like "like" or "comment", as well as using a leaderboard where the user's ranking and accumulated badges are shown. In a later version, the user is also allowed to form synergies with other users and compete against other teams thus emulating a competitive electricity market where the application moderator/coordinator has the role of the energy market regulation authority.

Finally, personalized communication is used for higher user involvement. For this, personalized data is needed which is accumulated through the user's motions as well as data entered by the user at various stages during the game as the user enriches his/her profile upon appropriate triggering.

4. The levels and other mechanics

The game has four counters: a) the ‘Wallet points’ which are accumulated when tasks and missions are accomplished, are spent when new higher energy class or energy generating devices are acquired and are lost when electricity is managed poorly b) the ‘Electrical Energy counter’ which emulates the energy meter recording net energy consumption in kWh c) the ‘Green bar’ which monitors the virtual building’s energy class d) the ‘Comfort bar’ monitoring the level of comfort in the building, following the user’s actions, according to existing standards and design specifications (Constantos et al, 2014).

The first level is a Tutorial responsible for a large part of user activation and motivation since it shapes the first impression of the user and, because it addresses most of the issues to be dealt with later on, is of high educational value. The user is introduced to the application’s environment and offered a virtual ‘tour’.

The user’s main quest is to maintain the values of three counters at levels that can ‘unlock’ the next level and progress in the game.

Next, the user is called to select from the application’s “inventory” typical home electrical and electronic appliances such as refrigerators, stoves, washing machines, dishwashers, TVs and computers, and position them in the 3D flat he/she is going to manage. The user is also asked to answer a set of quizzes in order to accumulate points. If the user fails he/she is prompted to read appropriate educational material available in the ‘library’ and take the test again. The tutorial level is educational and therefore mandatory. The user can move on to the next level only if he/she has completed a full tour of the tutorial of it at least once.

The Flat (or Residential) level (Figure 3) is unlocked once the Tutorial Level is completed. When the user touches the appliances and devices selected and placed in the Flat, tips and information appear concerning the electrical characteristics and energy consumption of each one. With the help of appropriate triggering and educational material, such as recommendations, explanations and definitions, the user is led to schedule the operation of the selected appliances in order to optimize the electricity consumption as well as the comfort level in the Flat. The user may increase the energy class of all buildings under his/her control by replacing existing appliances and devices with others of higher energy performance. This costs ‘Wallet points’ that are accumulated through the successful completion of tasks and missions.

The following level is the Office (or Professional) level (Figure 4) and concerns the energy management of an office complex. It is unlocked after the user has obtained the required number of points, which correspond to the experience and knowledge gained from the previous residential level. To attain the ultimate goal of net zero energy consumption buildings (nZEB), electricity microgeneration is necessary and therefore allowed from this level and on. The user first learns to optimize the electricity use and consumption of all his/her buildings, residential or professional, and then is allowed to use ‘Wallet points’ to spend for the installation of the electricity generation components. The concept of electricity production is a very important one in the game, since it allows the user to think of electricity as a resource and not simply as a costly comfort enabler. The user is also given access to educating material concerning electricity generation and storage devices, such as photovoltaics, wind turbines and batteries, as well as the relevant legal framework.

Figure 3. The 3D graphic user interface of the Flat level



Figure 4. The 3D graphic user interface of the Office level



The next and last level is the ‘My Home’ level, through which the user can a) simulate the electricity use of an actual installation, eg his/her house b) with the acquisition of appropriate hardware, monitor the electricity use of the actual installation per appliance or electricity line, and have full control

of it, setting operating points and allowing remote on/off. At this last level, the user is given the opportunity to relate what he/she has learned to the real world.

All the above mechanics are combined with progression metrics that calculate the user's progress in the game depending on the motivation of the phase in which he is. The Motivation Matrix is one of the major instruments used in gamification to present the ways that attract users, encourage them to remain active in the application and attract new users in turn, through the social mechanisms of the game. The users depending on the phase of the motivation matrix are divided into the 4 main categories such as guest, registered, social and devoted. Thus, the users of each main category depending on the actions that they are interested in doing are treated with a different approach though the motivation matrix (Constantos et al, 2015).

5. Conclusion

The 'Smartege' application introduces a new methodology for the development of educational gamified applications for mobiles, tablets and PCs targeting the modification of users' behavior. It is based on persuasive technology using the cognitive learning approach for the development of the educational content and game mechanics to increase user's engagement and motivation. The proposed methodology may be applied for the education of the general public in technological advances affecting directly the users' quality of life. As a test of the proposed methodology, a pilot application has been designed aiming to educate people in electricity use and other relevant issues in view of the transforming electrical energy grid and market, where the user is required to shift from being a passive consumer to actively participating, through the dynamic management of his electricity consumption and real-time interaction with the provider, small scale energy production and storage, or, even real-time trading of electricity. Having analyzed the three main areas of the game, namely the cognitive, emotional and social areas, we employ all FBM motivator dipoles as well as triggering forms to keep the user engaged in the process and guide him with the help of the educational content toward the desired behavior. The pilot application is currently under test and results will be reported in a future article.

Acknowledgements

This research has been funded by the project SMARTEGE – Smart system of educational gamified processes - 1605-BET-2013

References

- Pearson, G, Young, AT., Editors. (2002). *Technically Speaking: Why All Americans Need to Know More About Technology*, National Research Council
- Deterding, S. Dixon, D., Khaled, R., Nacke, L. (2011). *From Game Design Elements to Gamefulness: Defining "Gamification"*. In *Proceedings of the 15th International Academic MindTrek Conference: Envision Future Media Environments*, pp. 9-15
- Domínguez A, Saenz-de-Navarrete J, de-Marcos L, Fernández-Sanz L, Pagés C, Martínez-Herráiz JJ. (2013). Gamifying learning experiences: Practical implications and outcomes. *Computers & Education* 63 380–392
- McCombs B, Vakili D. (2005). A Learner-Centered Framework for E-Learning. *Teachers College Record* 107 (8) 1582-1600
- Lee, J.J., Hammer, J. (2011). Gamification in Education: *What, How, Why Bother? Definitions and Uses*. *Exchange Organizational Behavior Teaching Journal*, 15(2), 1-5.
- BJ Fogg., A Behavior Model for Persuasive Design, *Persuasive'09*, April 26-29. Retrieved from: <http://bjfogg.com/fbm.html>
- Bruce Wilshire. (1990). *The moral collapse of the university*. SUNY
- Bloom, B.S., Krathwohl, D. R. (1956) *Taxonomy of Educational Objectives. Handbook I: Cognitive Domain*. NY, NY: Longmans, Green
- Csikszentmihalyi, M. (2000). *Beyond boredom and anxiety*. San Francisco, CA, US: Jossey-Bass.
- Constantos E., Elias, C., Ktena, A., Manasis, C., Skarpetis, N., Tatsiopoulos C., Tatsiopolou A., et al, Zamani, E. (2014), *SMARTEGE user requirements*, Deliverable D1.1
- Constantos E., Elias, C., Ktena, A., Manasis, C., Skarpetis, N., Tatsiopoulos C., Tatsiopolou A., et al, Zamani, E. (2015), *SMARTEGE gamification design and methodology*, Deliverable D2.1

INCLUSION IN PRACTICE IN CYPRUS: A MATTER OF TEACHERS' BELIEFS

Elena Anastasiou

University of Manchester (United Kingdom)

Abstract

World-wide, there is a drive towards inclusive education and teachers play an important role in this process. Dyslexia is regarded as an international concern in many countries and an increased number of students with dyslexia are currently attending mainstream schools all over the world. Research studies conducted in the area of dyslexia and inclusion suggest that teachers' positive beliefs about their students' ability in learning along with their support in 'scaffolding' students' learning, is what matters the most for the support of those children. Many studies have examined teachers' beliefs and attitudes towards inclusion and dyslexia. However, there seems to be a limited number of studies who explore the link between teachers' beliefs and their practices for students with dyslexia. Examining this link is of high importance if skills for effective inclusion are to be developed. The aim of this study is to explore teachers' beliefs and their practices with central interest on the inclusion of students with dyslexia in primary school settings in Cyprus. Cultural-Historical Activity Theory (CHAT) is proposed as the lens through which to consider the complexities involved. Teachers' beliefs along with their practices are presented in an attempt to address the relationship between the individual (teacher) and the social (school as a system) as this is represented within CHAT. As such, a qualitative research methodology within the framework of CHAT is employed. The approach is based on in-depth interviews, classroom observations and follow-up discussions with the teachers. The present study is a work in progress and the preliminary findings will be discussed during the oral presentation of the conference. The implications of these findings are expected to be of consideration for teachers' in-service training and professional development for inclusive classrooms.

Keywords: *Inclusion, teachers' beliefs, dyslexia, teachers' practices*

1. Introduction

The area of special educational needs and learning difficulties has been the focus of many studies the last twenty years (Squires, 2012) particularly in relation to inclusive education and the central role that teachers play in this process. Jordan *et al.*, (2009) make the case that overall effective teaching, depends in part on the beliefs of teachers about the nature of disability and about their roles and responsibilities in working with students with special educational needs and disabilities (SEND).

The present study focuses on dyslexia and teachers' beliefs towards supporting students with dyslexia into mainstream classrooms in the context of Cyprus. A number of studies explored teachers' attitudes towards the inclusion of children with Special Educational Needs in mainstream schools (Avramidis *et al.*, 2000; Avramidis and Kalyva, 2007), pre-service teachers' attitudes towards dyslexia (Gwernan-Jones and Burden, 2009) or towards disability and SEN (Pearson, 2009). However, there seems to be a limited number of studies which examine the link between teachers' beliefs and their professional practice for students with dyslexia. It could be argued that examining this link is of high importance for developing more effective skills for including all students. As Jordan *et al.*, (2009) suggest "in elementary classrooms, effective teaching skills are effective for all students, both with and without special education needs" (p. 535). In order to consider the complexities involved, a Cultural Historical Activity Theory (CHAT) perspective (Roth and Lee, 2007) is proposed.

2. Dyslexia and teachers' beliefs

2.1. Dyslexia

Dyslexia is regarded as an international concern in many countries (Smythe *et al.*, 2005) and an area of debate since there is still not a consensus over a conclusive definition of dyslexia (Bell, 2010). This could be explained on the plethora of definitions that can be found around the globe depending on the context of each country. For the purposes of this paper, a working definition of dyslexia with no exclusionary criteria proposed by the British Psychological Society (BPS) Dyslexia Working Party (1999, p.18) is adopted: "Dyslexia is evident when accurate and fluent word reading and/or spelling develops very incompletely or with great difficulty. This focuses on literacy learning at the "word level" and implies that the problem is severe and persistent despite appropriate learning opportunities. It provides the basis of a staged process of assessment through teaching". This definition represents the core features of literacy learning difficulties which can be addressed in terms of what teachers can do in order to support those students.

Dyslexia, has been examined by different disciplines and sub-disciplines such as biology, neuropsychology, psychology, educational psychology, education, sociology of education) which all of them have contributed on our understanding of the characteristics of students with dyslexia (Armstrong and Squires, 2014). These different research approaches on dyslexia resulted into the development of different models of dyslexia which address different aspects of it. The purpose of this paper is not to provide a detailed account of all the different models but for clarification purposes it may make reference to the two most diverse models that have been used widely in the literature for explaining those children's learning difficulties: the medical model which emphasizes the within the child pathology and the social model which address issues that the difficulties of the students are the results of the society's and the wider environment's attitudes and beliefs towards those pupils (Riddick, 2001).

2.2. The Cypriot context

In Cyprus, the New National Curriculum (NNC) has been officially implemented in all public schools in Cyprus in 2011 and it is a reflection of the national report within the framework of the *Cyprus National Reform Programme 2011* (UNESCO, 2012); it emphasizes the role of teachers in Inclusive schools to 'respond to the diverse needs of the students, accommodating both different styles and rates of learning and ensuring quality education to all through appropriate curricula, organizational arrangements, teaching strategies, resource use and partnerships with their communities' (MoEC, 2008, p.7). This new reality in the educational system in Cyprus created a number of new expectations and responsibilities on the part of Cypriot teachers (Angelides, Constantinou & Leigh, 2009).

2.3. Teachers' beliefs

Lee and Smith (2001) state that 'There appears to be a high correlation between the extent to which a teacher articulates a belief in making a difference, and rejects deficit models of students and their families, with the quality of their pedagogies' (p. 37). It is suggested that teachers' commitments and capabilities is what matters the most for the support of children with literacy difficulties (Mills, 2006). According to Pearson (2009), models of disability are associated with different value systems, attitudes and behaviours and it is of high importance to be studied along with constructs such as disability and special educational needs. Jordan and Stanovich (2003) in their study examine the link between teachers' beliefs, their preferences for alternative delivery modes (e.g. withdrawal or in-class support) and their level of interaction with pupils. The authors contented that according to the model that teachers emphasize for the nature of disability, they view their role for instructing these students respectively. For instance, teachers who emphasize the endogenous nature of disability, view their responsibility and role for instructing these students as minimal and act accordingly. They have also asserted that collective school norms can influence the terminology used in the school with regard to diversity and the organisation structure of the school (Jordan and Stanovich, 2003).

2.4. Cultural historical activity theory (CHAT)

Cultural Historical Activity Theory draws on Vygotsky's (1978) concept of mediated action and on Leontiev's (1978) hierarchical structure of human activity. From a Leontievian perspective, activities are collective and motivated by the need to transform an object into desired outcomes. This motive gives sense and direction to the actions which are carried out by the subjects and which are oriented towards specific or finite goals. Actions, which are intentional are mediated by *tools*, which can be material (e.g. books, computers, approaches, etc.) or psychological (e.g. language, sign systems, models). Engeström's (1999) notion of activity systems, is an expansion of Leontiev's (1978) triadic model subject-tools-object; it includes the community, composed of participants sharing the same objective or motive, as well as the

rules and division of labour which govern the community and mediate the individual and collective actions carried out by the participants.. Activity theory has been applied to diverse disciplines and research areas including education in general (Edwards, Gilroy and Hartley, 2002), to specific curriculum areas (Van Alsvort, 2004), to the constructs of disability and special educational needs in inclusive education (Pearson, 2009), to the professional practice of educational psychologists (Leadbetter, 2005) and to special education (Daniels and Cole, 2002). However, there is a limited amount of research on using the Activity theory as a 'lens' to explore teachers' understanding and professional practice regarding the pedagogical issue of supporting students with dyslexia.

3. The present study

In this paper, part of the study that took place in two primary schools in Cyprus is presented. The aim was to explore teachers' beliefs about dyslexia and the link with their professional practice when working with students with dyslexia in their classrooms. The study is approached by the lens of the Cultural Historical Activity Theory (CHAT).

In this regard, two research questions are addressed as follow:

1. How do teachers understand the concept of dyslexia?
2. What are the factors that enable/limit the support that teachers provide to students with dyslexia in their classrooms?

4. Methods

Based on the exploratory nature of the study and the theoretical framework of CHAT guiding this study, a qualitative research design has been employed. The methods that have been used for gaining a more in-depth understanding of teachers' beliefs and practices are the following: semi-structured interviews, classroom observations and follow- up discussions.

4.1. Semi-structured interviews

Interviews were the main source of data and they have been used in different stages in this study. Firstly, they used in order to create the accounts of each participant. The purpose of the interviews at this stage was to gain a deep understanding of the experiences of the teachers on inclusion and dyslexia in relation to the different elements as these are proposed in the Activity Theory (AT) literature. This suggests that it would be useful to start addressing possible factors that might enable or limit teachers' professional practice in the classrooms (Pearson, 2009). The method of semi-structured interviews was planned to last approximately one hour per teacher and it was the first method used before the classroom observations. The interview schedule has been designed based on the relevant literature on inclusion and dyslexia, addressing the elements of activity theory. For example, I was interested in the element of subject (teachers). One theme developed in this regard, was that of getting to know the participants (eg qualifications, years of teaching experience, personal and professional experience with dyslexia, initial training on inclusion and dyslexia, continuing professional development). Other areas being addressed with regards to the elements of AT were those of the professional practice (eg resources and material the teachers use, techniques/methods and approaches), teachers' actions, collaboration with other members of the staff and the community and their role in assessment procedures.

4.2. Classroom observations

In terms of the use of classroom observations and teachers' lessons I use non-participant observations of lessons for each participant. Through the classroom observations I aimed to gain an understanding of the context of the classroom and the activities involved (eg how teachers work, what materials/resources, techniques and methods use the structure of the class (class size) and in what kind of activities the students are involved. Furthermore, I aimed to identify some specific events/episodes that take place during the lesson. Based on these events I would stimulate the follow-up discussions. The events for example, would be teachers' interaction with the student with dyslexia in particular tasks that the students have been asked to do. In doing so, I allowed the participants to reflect on their activities and provide more information about their views and their practice.

4.3. Follow-up discussions

The interviews in this method have been used a less formal, conversational interview based on the events emerged from the classroom observations. The aim of the follow-up discussions with the teachers was to give them the opportunity to reflect upon their practice and actions in the classroom.

According to Freire (1976), acting and reflecting on actions, new knowledge emerges. The interest in these discussions was to gain information on 'why' the teachers act and behave the way they behave in their classrooms but also at the same time to give them the opportunity to become aware of their students' learning in a more reciprocal seeking dialogue.

5. Discussion and conclusion

As discussed in the abstract of this paper, the current study is a work in progress and the preliminary findings and the conclusion of this study will be discussed during the oral presentation of the conference. The study uses a hybrid thematic analysis based on Braun and Clarke (2006) and Boyatzis (1998). The implications of these findings are suggested to be of consideration of teachers' continuing professional development for providing inclusive practice for all students including those with dyslexia.

References

- Angelides, P., Constantinou, C., & Leigh, J. (2009). The role of paraprofessionals in developing inclusive education in Cyprus. *European Journal of Special Needs Education*, 24(1), 75-89.
- Armstrong, D., & Squires, G. (2014). *Key Perspectives on Dyslexia: An Essential Text for Educators*. Routledge.
- Avramidis, E., & Kalyva, E. (2007). The influence of teaching experience and professional development on Greek teachers' attitudes towards inclusion. *European Journal of Special Needs Education*, 22(4), 367-389.
- Avramidis, E., Bayliss, P., & Burden, R. (2000). A survey into mainstream teachers' attitudes towards the inclusion of children with special educational needs in the ordinary school in one local education authority. *Educational psychology*, 20(2), 191-211.
- Bell, S. (2010). Inclusion for adults with dyslexia: examining the transition periods of a group of adults in England: 'Clever is when you come to a brick wall and you have got to get over it without a ladder.' *Journal of Research in Special Educational Needs*, 10(3), 216-226.
- British Psychological Society (1999) *Dyslexia, Literacy and Psychological Assessment. Report by Working Party of the Division of Educational and Child Psychology*. Leicester: British Psychological Society
- Daniels, H., & Cole, T. (2002). The development of provision for young people with emotional and behavioural difficulties: an activity theory analysis. *Oxford Review of Education*, 28(2 & 3), 311-329
- Edwards, A., Gilroy, P., Hartley, D., et al. (2002). *Rethinking teacher education Collaborative responses to uncertainty*. London: Routledge Falmer
- Gwernan-Jones, R., & Burden, R. L. (2010). Are they just lazy? Student teachers' attitudes about dyslexia. *Dyslexia*, 16(1), 66-86.
- Jordan, A., & Stanovich, P. (2003). Teachers' personal epistemological beliefs about students with disabilities as indicators of effective teaching practices. *Journal of Research in Special Educational Needs*, 3(1).
- Jordan, A., Schwartz, E., & McGhie-Richmond, D. (2009). Preparing teachers for inclusive classrooms. *Teaching and Teacher Education*, 25(4), 535-542.
- Leadbetter, J. (2005). Activity theory as a conceptual framework and analytical tool within the practice of educational psychology. *Educational and Child Psychology*, 22(1), 18-28.
- Lee, V., & Smith, J. (2001). *Restructuring high schools for equity and excellence: What works*. New York: Teachers College Press
- Leontiev, A. N (1978) . *Activity, Consciousness, Personality*. Englewood Cliffs, NJ: Prentice Hall
- Mills, C. (2006). Pre-service teacher education and the development of socially just dispositions: A review of the literature. *Paper presented at the Australian Association for Research in Education*, Adelaide, November 2006
- Ministry of Education and Culture. *The Education and Training of Children with Special Needs Law of 1999 (113(I)/1999)*. [Retrieved 15 May 2015]. Available from: <http://www.moec.gov.cy/eidiki/index.html>.
- Pearson, S. (2009). Using activity theory to understand prospective teachers' attitudes to and construction of special educational needs and/or disabilities. *Teaching and Teacher Education*, 25(4), 559-568.
- Riddick, B. (2001). Dyslexia and inclusion: time for a social model of disability perspective?. *International studies in sociology of education*, 11(3), 223-236.

- Roth, W. M., & Lee, Y. J. (2007). "Vygotsky's neglected legacy": Cultural-historical activity theory. *Review of Educational Research*, 77(2), 186-232.
- Smythe, I., Everatt, J., & Salter, R. (2005). *The international book of dyslexia: a guide to practice and resources*. John Wiley & Sons.
- Squires, G. (2012). Historical and socio-political agendas around defining and including children with special educational needs. In Armstrong, D., & Squires, G. (2012). *Contemporary Issues In Special Educational Needs: Considering The Whole Child: Considering the Whole Child*. McGraw-Hill International.
- UNESCO (2012) 'Cyprus National Reform Programme 2012' [Retrieved 20 May 2015]. Available from: http://www.ibe.unesco.org/fileadmin/user_upload/Publications/WDE/2010/pdf-versions/Cyprus.pdf
- Van Aalsvoort, J. (2004). Activity theory as a tool to address the problem of chemistry's lack of relevance in secondary school chemical education. *International Journal of Science Education*, 26(13), 1635–1651
- Vygotsky, L. S. (1978). *Mind and society: The development of higher mental processes*. Cambridge, MA: Harvard University Press

BUILDING GAMIFIED APPLICATIONS FOR INFORMAL EDUCATION

Aphrodite Ktena

Department of Electrical Engineering, TEI of Sterea Ellada (Greece)

Abstract

The staggering technological advances of the last decades and the rapid changes in the engineered world surrounding us make technological illiteracy a major handicap which threatens to create outcasts especially when combined with the ever increasing pressure of our civilization on the individual to compete harder. In this context, technological literacy becomes a transversal skill for all age groups. Informal education, the path typically chosen by those who feel marginalized by the formal school system, may be appealing to children and adults alike since it takes away the pressure of school performance and the stigma of failure. In this case, the challenge lies in engaging and retaining the students or learners in an active mode, in making them truly interested in their learning process and achievements. Gamification technology may be the key to the doors of engaging informal education programs targeting technological literacy. In this work, a methodology for developing gamified applications is proposed. It is based on a well established persuasive model according to which the path towards a targeted behavior depends on the skills and knowledge level of the individual, his/her motivation level and the appropriate triggering along the way. The proposed approach uses the cognitive model to establish and develop the individual's knowledge base and skills and the gamification mechanics for his/her emotional engagement and triggering. This methodology has been used to develop a pilot application intended to shape the future electricity users of the new electricity grid paradigm which places the user in the role of the active agent rather than that of the passive consumer/client.

Keywords: *Cognitive learning; behavior modification; technological literacy; electricity grid, electricity users*

1. Introduction

Achieving technological literacy, as a basic transversal skill enabling members of a society to interact with and participate in the world around them, in an intelligent and thoughtful manner, is of increasing and immediate relevance to developed societies (Pearson & Young, 2002; ITEA, 2007; NMC, 2013; NMC 2014). Technological literacy renders society members more immune to opinion manipulation and more likely to apply filters and good judgment in the adoption or use of some technology thus enhancing its positive aspects while subduing the negative ones. On the other hand, technological illiteracy is a self-sustained condition where lack of understanding and hands-on experience will make a technologically illiterate person less likely to learn through experience and develop intuition and judgment for technological applications.

The dazzling pace of the scientific and technological progress, particularly in the second half of the 20th century, has left the educational systems trailing behind gasping for breath in their effort to catch up and a large part of the population lost in an ocean of awe and ignorant bliss. More often than not, the former give up the unfair struggle, focus in providing solid, conventional tools that will hopefully enable the future citizens to learn for themselves and catch up on their own. More often than not, the latter are disenchanted by the outdated educational content which seems to belong in a different age than the one they are living outside school and end up brushing aside the tools offered to them, opting for the easier path of mass information rather than that of education. In this landscape, informal learning methods may be a valuable companion, alongside formal and non-formal education material and structures, in the struggle against technological illiteracy and social exclusion.

Gamification, loosely defined as a practice of using gaming technology and mechanics in non-gaming applications, is a promising informal learning methodology. Gamification may be applied in a) formal education in the traditional classroom environment as a complementary learning tool or in e-learning and distance learning platforms (Dominguez, et al, 2013; McCombs and Vakili, 2005; Lee and

Hammer, 2011) b) informal education and behavior intervention or modification (Carr, Taylor, Hunt and Mejia, 2014; Mohr, Schueller, Montague, Burns and Rashidi, 2014).

In this work, we present the guidelines for developing educational applications for informal learning based on Fogg's Behavioral Model (FBM, Fogg, 2009), a model targeting behavioral modification. The methodology proposed uses the cognitive approach (Bloom & Krathwohl, 1956) for capacity building and gamification mechanics along the lines of the flow model (Csikszentmihalyi, 2000) for user engagement. We have used this method to design an online application targeting the technological literacy and behavioral modification of electricity users from passive consumers to active agents in demand side management and smart grid technologies.

2. Informal learning and technological literacy

According to Piaget's cognitive child development theory, when a child's knowledge base can no longer account for the world around it, it enters a state of cognitive disequilibrium and is no longer able to assimilate and process the new knowledge and skills required by it. This leads to a frustrated state which is believed to drive the learning process in quest of a new equilibrium point. Though Piaget's theory is not concerned with adult learning processes, it may be applied to the cognitive development in adults in the same sense that Kant defines enlightenment as "man's emergence from his self-imposed nonage". We can argue that when adults become aware of the lack of knowledge on a certain problem, eg technological illiteracy, they enter a state of disequilibrium (Kavathatzopoulos, 2001). People need a minimum level of relevant knowledge in order to not be shunned and benefit from a novel technology or system. Seeking a new equilibrium state, the individual will either attempt to construct the new knowledge or seek it out where it exists and thus benefit from teaching or even informing.

Informal learning is usually one of the ways to obtain the necessary knowledge or information. Informal learning differs from formal and non-formal education or training because it takes place in the absence, or in spite, of authorized instructors, outside curricula and educational institutions. It can be a) self-directed, and therefore intentional and conscious, when undertaken by an individual or a group, being self-assisted, or using knowledge/information 'resources' found in another person or repository, eg Internet b) incidental and therefore unintentional but conscious c) tacit in which case it is unintentional and unconscious (Schugurensky, 2000). Informal learning, like formal and non-formal education, may build on existing components of our knowledge base (additive) or configure it anew by transforming its base units (transformative).

3. Online learning and gamification

Online learning is being heralded as the alternative path to 21st century education with reports, so far, suggesting that online learning is most efficient when adult groups are concerned (Livingston, 2012). The 2013 Horizon report for higher education (NMC, 2013) positioned massively open online courses (MOOCs) and tablet computing as enjoying widespread adoption in higher education, in the near term horizon (less than 1 year); and, games and gamification, and learning analytics in the mid-term horizon (2-3 years). The 2014 report (NMC, 2014) identifies social media and hybrid forms of conventional and online teaching methods and materials as a fast emerging trend; data-driven learning and assessment and a shift towards students being active co-creators of content as medium-scale trends; and, online learning and quantified self as a long range (4-5 years) trend.

The position of gamification, on the other hand, in the Gartner Hype cycle changed dramatically over the last 3 years from being at the end of 'innovation' triggering period (2012) to the peak of 'inflated expectations' (2013) to approaching fast the 'trough of disillusionment' (2014) and the 'plateau productivity' region faster than other emerging technologies.

Gamification is a promising technology for developing on-online educational content on the way to the next generation material for online learning in line with the quantified self. The gamification mechanics may be used to increase student motivation, engagement and interaction with one another, as they may appeal to the cognitive, emotional and social areas of players in a mixed and coupled way: eg a badge or an award for a player's achievement, communicated to all other players and obtained for mastering a given course content and attaining expected learning outcomes appeals to all three areas.

4. Design methodology

A design methodology for gamified applications used for informal online learning to increase technological literacy of societies is proposed in this section.

In (Pearson et al, 2002), technological literacy is conceptualized as a three-dimensional space defined by axes, x: ways of thinking and acting, y: knowledge, z: capabilities, where point (0,0,0) corresponds to poorly developed ways of thinking and acting, limited knowledge, low capabilities. A technologically literate person moves on a trajectory towards higher values of all three variables.

In terms of FBM (Fogg, 2009) and the flow model (Csikszentmihalyi, 2000) of Figure 1, the y-z plane defined by 'capabilities' and 'knowledge' collapses into the horizontal line labelled 'ability' in FBM (Figure 1a). Movement along the x-axis of technological literacy, labelled 'ways of thinking and acting', corresponds to the behaviour modification trajectory of FBM after motivation, along the perpendicular axis, and triggering is introduced (Figure 1a). Gamification mechanics are employed to motivate and trigger the user (Figure 1a) towards higher values along the 'challenge' axis of Figure 1b and guide him/her towards the flow region away from boredom and apathy, thus engaging him/her in the process of behaviour modification.

According to FBM, the process of guiding the user towards the target behaviour must consist of three building blocks: a) knowledge acquisition and skill development b) user motivation and engagement c) triggering on the right timing. For a given user with a given ability level, the right timing for triggering is a point on the plane, defined by the 'motivation' vs. 'ability' axes, which lies higher than the trajectory linking the initial and target behaviour, i.e. where the motivation is higher than the threshold value for the given ability level.

The 'ability' of an individual, defined along the horizontal axis of Figure 1a, is determined by the simplicity of the steps required to accomplish a task. An individual's ability is a function of six variables: money, time, physical effort, mental effort, social deviance and non-routine. The value of ability is determined by the variable with the lowest value at the time of triggering. In electrical circuits, this is analogous to parallel resistors: the overall resistance of the circuit is determined by the smallest resistor in the parallel combination through which flows most of the current.

Figure 1a. The flow model (Schlutter, 2013)

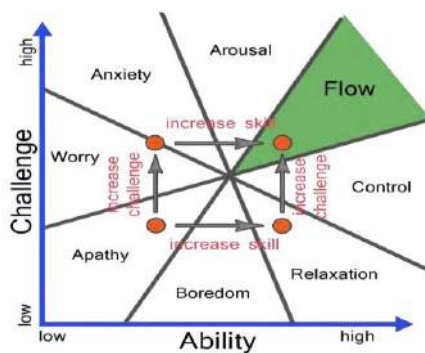
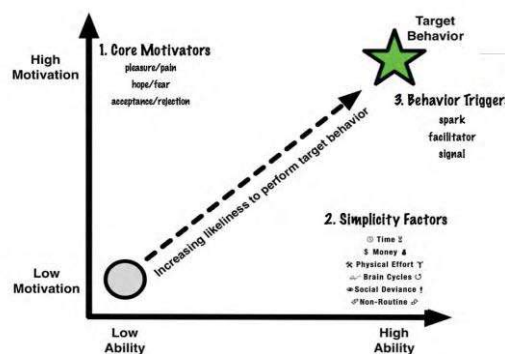


Figure 1b. The persuasive (Fogg, 2009)



The application content intended to increase the user's knowledge base is developed following the cognitive approach and Bloom's taxonomy (Bloom et al, 1956) and in agreement with the six levels of cognitive learning: know, understand, apply, analyze, evaluate, create.

Both the flow and persuasive design models are closely related to gamification (Schlutter, 2013) in the sense that the flow model must be taken into consideration when designing the gamification mechanics used for motivation and triggering.

Motivation is discerned into three dipoles: a) the pleasure/pain motivator has an immediate effect on the user, eg gaining/losing points b) anticipated hope/fear has a long-term effect, eg move towards/away from mastering a level, c) social acceptance/rejection which is increasingly important with the advent of social media, eg score high/low on leaderboard.

Triggers are categorized into: a) sparks for unmotivated individuals, eg messages triggering any of the three motivators described above b) facilitators for individuals of low ability, eg tips c) signals, for individuals of sufficient motivation and ability, eg notifications for the right timing.

Successful gamified learning should also observe gamification principles and taxonomy (Ivetic and Petrovic, 2012): feedback to the user must be ensured, eg in the form of counters and awards; the social dimension of the application should be served by both user-system and user-user interaction, eg in the form of messages, invitations, interactive content development; self-competition, eg in the form of achievements and competition against the other users, eg in the form of leaderboards, should be allowed; progression should be guaranteed through the transparent profiling of each user and the well-defined ultimate goal; graphics, colour and a narrative pertaining to real world situations should be used.

5. An application for literacy in electrical energy technology

The power grid, enabled by technologies such as renewable energy sources (RES), telemetering and telecontrol, intelligent management, is required to abandon the traditional supply side management in favour of the novel demand side management, under the pressure for energy saving and low carbon emissions on the one hand and electricity market deregulation on the other. Demand side management requires the user to be an active agent interacting in real time with the grid and the markets rather than a passive consumer receiving and paying the electricity bill on a regular monthly or bi-monthly basis. In this new techno-economical environment, the majority of electricity users, the majority of our co-citizens are technologically challenged if not illiterate.

Surveys have shown (Constantos et al, 2014) that a significant number of electricity users lack fundamental knowledge and skills: they cannot read their electricity bill, do not know what a kWh stands for, are not aware of their energy profile and needs, cannot estimate their consumption, never mind making informed decisions on RES installations towards net zero energy building (nZEBs) which are one of the EU 20-20-20. Their inability to function in the emerging electricity grid landscape hinders the uptake of technologies and policies that will facilitate the transition to the demand side management, or even adopting new habits with respect to the much advertised energy savings. Due to aggressive marketing, they respond positively to buzz words such as RES, photovoltaics, smart meters, etc, but are not aware of how these technologies may affect their lives, the limitations and trade-offs or the value for money involved.

Existing applications, such as Electric Box, Energy Quest, Ollie's World, EcoKids, Kids Energy Zone, Electocity, Power Matrix, Energy Ville, 2020 Energy, are focusing mostly on children's and teenagers' conditioning towards a more 'green' overall attitude, or address only one type of a user's interaction with the electricity grid: generation, consumption, or saving (Constantos et al, 2014).

In light of the above, we have developed a gamified application, as outlined above, in order to educate all electricity users, regardless of age or background, and guide them from being passive electricity consumers towards actively interacting with the grid and the market (Constantos et al, 2015). To accomplish this, the user must not be simply informed but develop a knowledge base on electrical energy technology. Hence, the FBM approach is used of capacity building, motivation and triggering.

The expected learning outcomes for the user, as a consumer, are to: know the basic notions and definitions of electrical energy; understand the relationships between the electrical energy quantities; apply this knowledge to a building's energy management; analyse the energy profile of a building; evaluate the energy performance of a building; create energy efficient scenario for energy management.

The expected learning outcomes for the user, as an electricity producer and agent, are to: know the basic notions and definitions of electricity production and market; understand the relationships between the electrical energy production and consumption; apply this knowledge to the management of small RES installations and electricity trading; analyse the techno-economical profile of a RES installation; evaluate the performance of a RES installation; create energy efficient scenario for RES management.

The application presents a virtual environment that emulates the basic daily functions and actions of an electricity user in a house and an office building, in real or accelerated time. Using gamification mechanics, such as badges, leaderboards, levels etc the user is gradually trained to understand the energy profile of appliances and equipment operating in the virtual building with respect to the set points defined by the user, to evaluate the effect of his/her actions and habits on them, to analyse the costs and benefits associated with energy upgrading or saving tactics. The user is gradually allowed to virtually produce electricity in order to attain the ultimate nZEB goal. The user's ability is improving through knowledge content offered in various forms, such as tips, information, reading material, quizzes, exercises, and is guided through the process with appropriate triggering while being motivated by counters, reputation points, leaderboards, badges. All types of motivators are used while special emphasis is given in the social dimension as the user is interacting with other users and is allowed to exchange information or messages and compete or form synergies with them. At advanced levels, with the purchase of appropriate hardware, the user can emulate, monitor and control the electricity use and production of a real installation.

The pilot application is now in its final testing phase and preliminary results on its potential for behavioural intervention are expected in the coming months.

6. Conclusions

The models used in developing an gamified applications for informal learning targeting technological literacy are presented and are applied to develop a mobile/tablet application for literacy in

electrical engineering technology. When developing applications for adult learners one must keep in mind that their motivation stems for a variety of reasons and their engagement is linked to immediate, tangible results. Such an application must offer feedback in a form similar to the student assessment while not snubbing the gaming practices, have a clear aim and not rely simply on the user's desire for learning and investigation, pertain to the user's everyday life, experience, and culture, use gaming practices to engage the user, allow for design of own learning path and curve, allow for social interaction.

The benefits and mechanics of gamification have been presented as a novel education tool with applications in informal learning towards technological literacy. However, every technology has its limitations, trade-offs and risks. When designing such an educational application we should ask ourselves why is gamification necessary in this particular case, which is the purpose and interests served in the edutainment business, what are its long-term effects on mass education (Livingston, 2012). Finally, the ubiquitous nature of such applications encourages the spread of mistakes and erroneous information so careful control over content is needed.

Acknowledgements

This research has been funded by the project SMARTEGE – Smart system of educational gamified processes - 1605-BET-2013

References

- Pearson, G., & Young, AT., Editors. (2002). *Technically Speaking: Why All Americans Need to Know More About Technology*, National Research Council
- ITEA. *Standards for Technological Literacy*. (2007). Content for the Study of Technology, International Technology Education Association
- ASTD Research Study. *Tapping the Potential of Informal Learning*. (2008). American Society for Training & Development
- The NMC Horizon Report. (2013) & (2014) Higher Education Edition
- Domínguez A, Saenz-de-Navarrete J, de-Marcos L, Fernández-Sanz L, Pagés C, Martínez-Herráiz JJ. (2013). Gamifying learning experiences: Practical implications and outcomes. *Computers & Education* 63 380–392
- McCombs B, Vakili D. (2005). A Learner-Centered Framework for E-Learning. *Teachers College Record* 107 (8) 1582-1600
- Lee, J.J., Hammer, J. (2011). Gamification in Education: What, How, Why Bother? Definitions and Uses. *Exchange Organizational Behavior Teaching Journal*, 15(2), 1-5.
- Carr D., Taylor H., Hunt R., Mejia T. (2014). *Gamification and adult literacy*, Report of Literacy Link South Central's Job Creation Partnership Project.
- Mohr DC, Schueller SM, Montague E, Burns MN, and Rashidi P. (2014). The Behavioral Intervention Technology Model: An Integrated Conceptual and Technological Framework for eHealth and mHealth Interventions, *J Med Internet Res*. 16(6): e146
- BJ Fogg., A Behavior Model for Persuasive Design, Persuasive'09, April 26-29. Retrieved from: <http://bjfogg.com/fbm.html>
- Bloom, B.S., Krathwohl, D. R. (1956) *Taxonomy of Educational Objectives*. Handbook I: Cognitive Domain. NY, NY: Longmans, Green
- Csikszentmihalyi, M. (2000). *Beyond boredom and anxiety*. San Francisco, CA, US: Jossey-Bass.
- Kavathatzopoulos, I. (2001). *IT user learning: the role of informal processes*. In Makrakis, V. (Ed.), *New Technologies in Education and Distance Education* (pp.227-345), Athens, Greece: Atrapos
- Schugurensky D. (2000). *The forms of informal learning: towards a conceptualization of the field*. WALL Working Paper No.19. Ontario Inst. for Studies in Education of the University of Toronto
- Schluter, M. (2013). *The Psychology of Games*, <https://bizfest.wordpress.com/2013/01/29/the-psychology-of-games/> Visited: May 26th, 2015
- IVETIC, D., Petrović, V. (2012) Gamifying education: a proposed taxonomy of satisfaction metrics, Conference proceedings of "eLearning and Software for Education" (eLSE) 02:345350.
- Constantos E., Elias, C., Ktena, A., Manasis, C. Skarpetis, N., Tatsiopoulos C., Tatsiopolou A., et al, Zamani, E. (2014), *SMARTEGE user requirements*, Deliverable D1.1
- Constantos E., Elias, C., Ktena, A., Manasis, C. Skarpetis, N., Tatsiopoulos C., Tatsiopolou A., et al, Zamani, E. (2015), *SMARTEGE gamification design and methodology*, Deliverable D2.1
- Livingstone S. (2012) Critical reflections on the benefits of ICT in education, *Oxford Review of Education*, 38 (1) 9–24

PATHWAYS TO UNITED UKRAINE: TEACHER CANDIDATES LEARN TO HANDLE INTRANATIONAL CONFLICT

Tetyana Koshmanova¹ & Tetyana Ravchyna²

¹Department of Teaching, Learning and Educational Studies, College of Education and Human Development, Western Michigan University (U.S.A.)

²Department of General and Social Pedagogy, Pedagogical College, Ivan Franko National University of Lviv, (Ukraine)

Abstract

In divided societies with a legacy of ethno-political conflict, teacher education systems can also be segregated along with ethno-political lines. Integrated or co-education of prospective teachers from the regions that have suffered from prolonged conflict can be seen as one of the ways forward to reduce conflict and promote peace. The paper is aimed at improving the conflict handling by teacher candidates through the use of an integrated program. Despite a number of challenges, the study showed that integrated education holds great potential for promoting forgiveness, reconciliation, as well as intergroup attitudes and social cohesion.

Keywords: *Teacher education, integrated program, ethnic conflict.*

1. Introduction

Ethnic intolerance is a major obstacle to the development of a truly democratic and inclusive society in any post communist country. The numerous ethnic conflicts that have occurred in various regions of the former Soviet Union—in Russia, Transnistria, Georgia, Abkhazia, and Ukraine—amply attest to the seriousness of this problem.

The ongoing violent conflict in Ukraine became the bloodiest in Europe since the Balkan wars. In less than a year, due to the fighting in eastern Ukraine, about eight thousand lives were lost and over 15,000 people were wounded, both civilians and military. The situation in eastern Ukraine also has an impact on human rights in the rest of the country. There are now 1,5 million registered internally displaced people and more than a million children of war. In many locations, reception centers for them are overwhelmed and under-resourced. Many have been trapped in conflict zones, forced to shelter in basements, with hardly any food, water, heating, electricity or basic medical supplies.

Discussing the challenges of pedagogical re-conceptualization in Ukraine, the study addresses ethnic conflict through the use of integrated education for peace. The article specifically analyses the research experience of teacher candidates as they reflected on their multiethnic learning practices. Despite a number of challenges, the conducted research showed that integrated education holds great potential for promoting forgiveness, reconciliation, as well as intergroup attitudes and social cohesion.

2. Design

2.1. Cultural and social impacts on social identity

The collapse of the Soviet Union necessitated a shift in national identity in post-Soviet Ukraine. The Soviet identity devised by Moscow (“Homo Sovieticus”) was no longer valid after the Union disintegrated. A new Ukrainian identity was needed. The processes of Ukraine’s national identity formation turned out to be extremely complex, controversial and painful. An especially strong factor of the country’s division turned out to be western Ukrainian nationalism that converted a nationalist ideology into an educational reform of molding a new Ukrainian-speaking nation from a heterogeneous population. By targeting education for educational reform, political leaders capitalized on the potential of schools to instill ethnocentric values and articulate norms and traditions of the Ukrainian culture to protect the cultural heritage of the nation and its right to self-determination. Disturbingly, these state-sanctioned efforts to impart a collective Ukrainian identity have evolved into a common belief about the uniqueness of the Ukrainian mentality, human traits and souls, along with unquestionable superiority over other

cultures (Verbitskaya, 2003). This effort to create a new Ukrainian citizen has fostered the aggressive assimilation of people of other cultural identities who have inhabited the country along with 'pure' Ukrainians (Batt, 1998; Azari, 2002). The assimilationist policy and low level of democratic culture created many challenges to the goal of solidifying peace in the Ukrainian post-communist setting. These challenges were also fuelled by politicians. According to the 12 surveys conducted by Kyiv International Institute of Sociology, in 1994-2004, after each presidential campaign, the levels of xenophobia, as well as anti-Russian and anti-Ukrainian moods, were increasing (Koshmanova & Ravchyna, 2010).

Ethnic intolerance became even stronger after the Orange Revolution (2004) and Revolution of Dignity (2014). Both revolutions brought democratic mood to the nation, but revealed strong national identity crisis, which caused great political instability in the region, led to deep ethnic, religious, economic and political divisions, and eventually split the Ukrainian nation into two opposing parts—Ukrainian speaking west and Russian speaking east: a division that is noticeable in culture, religion, historical memory and ways of social development.

2.2. Research base

There is a growing recognition among educators that radical ideological thinking forms underpin violent reactions to political conflicts (Koshmanova & Hapon, 2007). Among other incidents around the world, the tragedies of the Balkan wars and September 11, 2001 have heightened educators' worries about, as well as interest in, handling conflicts and extreme social events. One constructive response has been a sentiment for expanding understanding of other nations' languages, cultures, and immediate needs, in addition to our social, political and economic interaction with their populations, understandings that the K-12 teacher is in a unique position to facilitate and imbue. Our roles as teacher educators in classes where teacher candidates were responding to the intranational conflict provided the opportunity for looking beyond prior studies of human behaviors in the context of crisis.

Research in Ukraine, Russia and the USA made the basis for our study. Research on the historical memories and behaviors of people in social conflicts found an influence of social or collective memory (Cohen, 1989). This indicates the close interconnection between personality development and cultural-historical change. In the frames of such an approach, human memory is considered to be a function of constructing and reconstructing the past, which is submitted to the situation based on needs in the present and future.

Cognitive modelling of the past is influenced by the sociocultural situation, in which a person lives. According to Barclay (1996), sociocultural contexts are capable of making a strong impact on the meanings of people's personal stories and narratives which are important for the construction of "self". Consequently, sociocultural context can influence individual memories about social conflicts. The social memory (Bauman, 1982) reproduces and describes past events and society to maintain social order. As Connerton (1989) asserts, members of any society should preserve in their memory those values, which unite them and make them co-participatory.

Social beliefs, reactions, and memory have been examined with qualitative methods of research, mainly through incorporation of narrative analysis. Qualitative methods, such as investigation through narrative analysis, dialogue, discussion, reflection, peer-mediation and academic service learning, are directed toward a broad spectrum of phenomenology. Narrative analysis reveals data, such as reason-outcome explanations, which are useful for examining human cognition. The unconscious motivational elements of different perceptions produced by the sociocultural impacts and individual consciousness are evident through discourse analysis. Methods of examining narrative data have been used for studying war responses (Koshmanova & Hapon, 2007).

Education in the context of social crisis and ethno-political conflict needs examination in terms of teacher preparation. Teachers are challenged with helping students recognize their thought processes as they hear political and media accounts of social violence described as acts of "terrorism". Relevant to the field of teacher education, there is a pedagogical value of using narrative analysis (Koshmanova, Hapon, & Carter, 2007). As a social construct, this method displays social learning, which illustrates the content of the studied phenomenon. When changes of the sociocultural situation lead to the formation of different narratives about a studied event, deeper and pluralistic learning can occur through analysis of narrative data. Research on forgiveness and reconciliation focuses mostly on interpersonal relationships, though some studies have been conducted in the context of intergroup relations, intergroup conflict and reconciliation (McGlynn, Niens & Cairns and Miles, 2004). Empirical research on intergroup forgiveness in the context of ethno-political conflict is rare. Intergroup forgiveness and reconciliation could be considered an issue for society as a whole because personal injuries by the parties in conflict are often understood as a grief of whole communities (Morrow, 2000). As intergroup forgiveness and reconciliation describe affective, cognitive and behavioral components of conflict resolution, they also appear to describe integrated programs, which promote a societal movement from conflict to peace. In the

context of ethno-political crisis, forgiveness by members of all social groups affected by the conflict is often regarded as a necessary prerequisite for reconciliation.

There is an ample research on the positive impact of integrated education on resolving ethno-political conflict, on outgroup attitudes to forgiveness and reconciliation, the relevance of educational programs aimed at diminishing conflict and promoting peace (McGlynn, Niens & Cairns and Miles, 2004). From this point of view, the introduction of citizenship education is suggested as a way of moving beyond community differences and promoting social inclusion and multiculturalism. While integrated schools may provide a systemic structure which supports intergroup relations, a proactive approach to integration is required to promote critical thinking, a feeling of responsibility to society and involvement in political processes which may contribute to positive group relations.

3. Objectives

The paper is aimed at improving the conflict handling by teacher candidates through the use of an integrated program. The main purpose of this program has been to develop students' dispositions of reconciliation, co-existence, trust and acceptance of those who are from different ethnicities or have different points of view, as well as to foster students' desire and readiness to build a renewed, shared culture of living and working together. The study used conflict management as the theory and practice, and peer mediation, facilitation, simulation and academic service learning as the pedagogy in order to empower teacher candidates who were going through the integrated program to manage their own conflict experiences in all aspects of their lives. The integrated program lasted for one semester in Fall 2014.

4. Method

4.1. Setting

The study was conducted in one of the largest and oldest western Ukrainian universities that prepares teachers for their future practice. The integrated constructivist teacher education offered in the university was an undergraduate level program that allowed students to earn Bachelor's and Master's degrees and K-12 teaching certification. The constructivist approach, in contrast to approaches that view the purpose of a teacher as merely transmitting knowledge, requires students to be active and critical participants in the formation of their intellectual development, and to evaluate their performance in terms of its effects upon children, schools and society (Clark and Koshmanova, 2000).

4.2. Participants

Students diversity was ethnic, political and economic, although they all were predominantly of the middle class, with medium age of 21-23. All the participants [N=53], were juniors enrolled in the integrated constructivist program during the Fall semester 2014. There were more female [N=33] participants than males [N=20]. All students were prospective teachers of foreign languages.

4.3. Integrated constructivist program structure

The integrated constructivist program was aimed at the development of students' critical thinking, their cognitive and emotional judgments about the essence of democratic values, as well as skills of analysis of current ethno-political crisis and conflict resolution in Ukraine. The realization of the program took place in stages; at each stage, in accordance with its tasks, necessary strategies were implemented for the gradual development of future teachers' willingness and readiness to interact with people with different political views and cultures, as well as to unite young people in cooperative learning communities. An important condition for the organization of the integrated program was to establish supportive, democratic and productive environment. We believe that educational environment has a great influence on the formation of civil and democratic dispositions of students if it embodies a model of tolerance and respect for each person, his/her opinion; forms a community united by a common purpose; and if all the ideas and values that are discussed in class are practiced and experienced by the participants in real lives. The main directions of the organization of the educational environment include: the introduction of rules for behavior of teachers and students, which are based on democratic principles of respect, openness, tolerance, trust for each individual and his/her position; the development and support for the unity of cognitive, emotional and behavioral activity of students; the involvement of students into sharing their experiences, attitudes, and values; the development of different forms of cooperation of students for setting shared, goals, activities, and action plans; teaching students the skills of metacognition, regulation of their own behavior in the process of collective action and interaction with others.

4.4. Introductory narratives

During the first class of the integrated program, students were invited to write narratives, in which they had to describe their opinions regarding the following questions: What is your attitude to the citizens of Ukraine who do not support the idea of the unity of our state? Are you ready to interact with people, whose views contradict to your pro-Ukrainian position? What can you do to unite the east and west of Ukraine? Although the judgments of students had personal coloring, there were similarities observed in their responses, which allowed us to divide them into three groups. Representatives of the first group [N=14: 26%] regretted that the citizens of Ukraine did not defend the interests of the state. Students whose opinions related to the second group [N=21: 40%] didn't like people who do not have a clear civic position. The third group included those students [N=18: 34%], who blamed the eastern Ukrainian citizens, did not worry about the unity of the state, and blamed them for the conflict in the east of Ukraine. In answering the second question, 23% [N=12] of students believed that they could interact with people who have opposite position; 37% [N= 20] of students had expressed the view that they could communicate with such people, but do not want to maintain a relationship with the Ukrainians without distinct civic position. And 40% [N=21] of students refused to interact with citizens who are against the unity of Ukraine. Even some members of this group of people believed that such people are enemies of the state, and therefore other people shouldn't communicate with them. All students in their narratives were in favor of a mandatory need to unite Ukraine. However, a significant number of future teachers [N=29; 55%] believed that the government is responsible for the resolution of this issue, that they shouldn't rely on volunteer assistance to assist the displaced people from the eastern region of Ukraine. Other students [N=24: 45%] expressed their view that they contribute to the development of the united Ukraine by establishing contacts with the youth of eastern Ukraine in the social network, inviting these citizens to different regions of western Ukraine, as well as assisting migrants from the east and maintaining dialogue with them.

Based on the analysis of narratives, we developed an integrated program, its structure and strategies. At the initial stage of this program, students were encouraged to visit the wounded soldiers from the Anti-Terrorist Military Operations, who were recovering in the hospitals in their city, as well as to assist displaced people from the east of Ukraine and meet with some families. Students, together with their instructors, jointly defined the objectives, as well as a list of questions that students had to ask soldiers and those people who survived the war in the east of Ukraine. Meeting and socializing with people who were in the war zone was also included to the initial stage of academic service learning. After performing this task dialogues were organized in a group of future teachers where they discussed questions: What sense citizens and soldiers who survived through the war? What unites these people? What they need, first of all? This dialogue enabled the students to reflect on these questions, to understand their own experiences and lessons learned in communicating with people who have different opinions and views. On the basis of these dialogues, future teachers, under the guidance of instructors, analyzed the essence of such dispositions as respect, human dignity, tolerance, trust and reconciliation; evaluated their values important for communication with people of different cultures, beliefs, attitudes, and personal attitude to these values.

In the second phase of the integrated program facilitation was conducted, which was aimed at the brainstorming of ideas by students and making their decisions on these issues: How to help people, children, survivors of the horrors of war? How to help and support the soldiers, who were in the war zone? Students were given the opportunity to freely express their ideas, which normally were not discussed; some participants were recording these ideas on the flip chart. At the end, the brainstormed ideas were refined, systematized, and the students made their own conclusions. The brainstorming of ideas helped students together with their instructors to develop an action plan for their assisting displaced children from the east of Ukraine who now live in the west of Ukraine, as well as soldiers-combatants.

The organization of interaction of students with the war zone participants became the next step in an academic-service learning. The results of students' work with children and families of refugees, as well as assisting the military, were discussed in the classroom, which enabled students to make specific decisions regarding the improvement of cooperation with them. After the conducted work, the participants analyzed in writing their personal behaviors, exposing, in concrete actions, such values as respect, trust, tolerance, openness; they also described their successes.

The conducting of peer mediation provided the training for future teachers in their skills of negotiation between the people with opposite views who are in conflict with them. For this purpose, different educational situations were simulated, in which there were differences between students regarding the future development of Ukraine. To train future teachers the ability to negotiate, multiple sessions of peer mediation were conducted, during which each student tried to carry out the role of both the student, and the mediator. Previously, students under the guidance of the instructor, learned in detail the roles, functions and specific actions of a mediator for each stage of mediation. After the conducted sessions of peer mediation, the students made their conclusions on conflict management, and ways of resolving the contradictions between people with opposing positions.

5. Discussion

The exit narratives conducted at the end of the integrated program clearly showed changes in the dispositions of the students. Analysis of the participants' judgments demonstrated that the students' attitudes to Ukrainian citizens, who have a different position, have positively changed. Students did not demonstrate the negative attitudes to the Ukrainians, who did not defend the idea of the unity of the state. The number of students [N=23: 46%] who had not accused citizens of their opposing views increased; they believed that they had good reasons for that change. Also, there were more students [N=30: 57%] who wanted to hear and understand people with different views. A significant number of future teachers [N=25: 47%] confirmed their readiness to cooperate with those citizens, with whom they initially disagreed. A certain number of students [N=28:53%] believed that teachers should be able to maintain contact with people who have expressed conflicting opinions. The result of the analysis of the narratives also showed that there were no students who called civilians in eastern Ukraine as enemies of the state. In their narratives, the students also expressed specific proposals for the reunification of the eastern of western Ukraine. The program demonstrates the growth of social coherence of the participants and positive intergroup dynamics.

6. Conclusions

To assess the effectiveness of the conducted program, researchers examined introductory and exit narratives of the Ukrainian teacher candidates about their readiness to accept people with different points of view and their visions on the ways of uniting eastern and western Ukraine into one nation. Discourse analysis confirmed the effectiveness of the integrated program. Our analysis of their narratives also revealed social variation and a need for reflective metacognition that can reveal factors, which influence thinking about and response to the extreme social crisis. This awareness is crucial for educators who are helping their students to accept those who have different points of view. The study recommends strategies for teachers and their educators who are teaching in the context of social crisis.

References

- Azari, A. (2002) Blossoming of ethnic minorities is the best indicator of nation's health, *The Mirror of the Week*, 31 (406), 5-6.
- Barclay, C. R. (1996) Autobiographic remembering: Narrative constrains on objectified selves. In D. C. Rubin (Ed.) *Remembering our past; Studies in anthropological memory* (pp. 94-125). Cambridge: University Press.
- Batt, J. (1998) National identity and regionalism: Introduction, in T. Kuzio (Ed.) *Dynamics of Post-Soviet transformation: Contemporary Ukraine*. New York: M.E. Sharpe, 57-59
- Bauman, Z. (1982). *Memories of Class: The Pre-History and After-life of Class*. London: Routledge & Kegan Paul.
- Clark, C., & Koshmanova, T. S. (Eds). (2000). *Culture and community in learning to teach: Ukraine and the U.S.A.* (L'viv: University of L'viv Publishers.
- Cohen R. (1995), *Students Resolving Conflict: Peer Mediation in Schools*, N. P.: Good Year Books
- Connerton, P. (1989) *How Societies Remember*. New York: Cambridge University Press.
- Koshmanova, T. S., Hapon, N. P., & Carter, C. C. (2007). Extreme social situations in the narratives of Ukrainian teacher candidates. *Teaching and Teacher Education*, 23 (4), 215-225.
- Koshmanova, T. S. & Hapon, N. P. (2007). Exploratory study of changing ethnic stereotypes of Ukrainian teacher candidates. *Journal of Peace Education*, 4 (1), 75-95
- Koshmanova, T.S. & Ravchyna (2010) Ukrainian teacher candidates develop dispositions of socially meaningful activity *International Journal of Educational Reform*, 19, 2, Spring, 2010, 107-128
- Kuzio, T. (1998) *Ukraine: State and nation Building*. London and New York: Routledge
- McGlynn, C. Niens, U., Cairns, E. & Hewstone, M. (2004) Moving out of conflict: the contribution of integrated schools in Northern Ireland to identity, attitudes, forgiveness and reconciliation. *Journal of Peace Education*, 1 (2), 147-163.
- Morrow, D. (2000) *Forgiveness and Reconciliation*. Available online at <http://cain.ulst.ac.uk/dd/report13/report13a.htm> (accessed 12 February 2012)
- Polkinghorne, D. E. (1988). *Narrative knowing and the human sciences*. New York: State University of New York Press.
- Verbitskaya, Y. (2003) Non-child story, or how to mould nationalists from the fifth-graders. *Crimian Truth*, 4, 2-3.

LEARNING THE ROPES: A NEW PERSPECTIVE ON CHILDREN CROSSING CULTURES

Patricia E. Reynolds, Ed.D
University of Mary Washington (USA)

Abstract

As more and more students from diverse backgrounds enter classrooms worldwide educators often struggle with what are the best practices for engaging students from different cultural perspectives. In a recent classic grounded theory study of how children acculturate, learning the ropes became the basic social process students engaged in as they crossed cultures. Learning the ropes, a new perspective on this process, indicated that a strong educational focus on language development contributes to the ways an individual would enter and sustain the acculturation process. The theory suggests that sociocultural aspects of the process should be more carefully integrated into school settings to provide children crossing cultures with a more successful model toward acculturation. Advocacy for children during this process may be one of the aspects lacking in current practice in education today. Educators may be missing some important knowledge about how the process can be enhanced to build a stronger community connection for Language Learners as they make the journey across cultures.

Keywords: *Cultural dissonance, acculturation, Second Language Acquisition*

1. Introduction

Education for the twenty-first century means education for an increasingly diverse student population in classrooms worldwide. Understanding characteristics of ethnic minorities who speak a language other than the language that is the vehicle of instruction in the classroom is becoming a necessity for all educators. Newly immigrated legal, illegal, refugee, and asylee children enter school systems and attempt to learn a new language, make new friends, achieve academically, and function in a strange culture (Abed & Sheldon, 2008; Batalova, 2008). Children involved in the process of crossing cultures, either newly arrived or native-born in the nation where they attend school, are labelled international students, migrants, guest-worker children, transcultural, or cross-cultural children in school settings. Experiences in school environments can best be described as complex or even possibly “incomprehensible” (Granger, 2004, p. 3) in the demands placed on such transcultural children. Crossing cultural boundaries may also affect children’s abilities to garner opportunities in their current academic environments and to make constructive decisions about future educational paths (Berk, 2006; Taylor, 2004).

Language acquisition for this group of children has been regarded as the *measure of success* in the educational arena and the hallmark of progress toward acculturation in the new society (Philip, Oliver, & Mackey, 2008; Shohamy, 2006; Spolsky, 2004). Educators now recognize that migrants and second-generation children are being exposed to a two-fold issue in their education. The difficult processes of both language development and identity development must be achieved simultaneously so transcultural children can progress in educational environments filled with perceptions, subjectivity, and symbolism of cultural belonging (Berk, 2006; Woolfolk, 2009). A gap in educators’ information about these processes may be to the detriment of the children having to experience these developments in educational environments (Philip, et al., 2008).

Students who consider themselves to be in control of their own academic futures and who see learning success as being within their capabilities become predisposed to do the things that will result in behaviors that lead to success over time (Philip et al., 2008). For transcultural children, the lack of control over their situations may lead to behaviors that either facilitate or hinder their success in the new culture. Transcultural students are often seen as lacking the cultural capital necessary to succeed in the dominant culture (Trueba, 2004). However, as education moves toward a broader vision of the world and the potential for globalization of industry and society increases, this more diverse, cultural capital may

become crucial to the future of the adopted nation. The mastery of different languages, the ability to cross racial and ethnic boundaries, and a general resiliency associated with the ability to endure hardships and overcome obstacles will clearly be recognized as a new cultural capital that will be crucial for success in a modern diversified society (Trueba, 2004, p. 26).

2. Objectives and Methods

Little is known about the effect of crossing cultures on children in an educational environment (Caldwell-Harris, 2008; Dornyei, 2009; Mencken, 2008; Philip et al., 2008). Transcultural children may not fully comprehend what lies ahead for them because of their lack of personal experience and age-related developmental or emotional stages (Berk, 2006; Spolsky, 2004; Woolfolk, 2009). Caldwell-Harris (2008) argued that the difference between children acquiring language and adults using language is often an overlooked aspect of any cross-cultural acquisition research and debate.

For the most part, common understandings of cross-cultural issues have been developed based on previous research with adults who are choosing to seek educational or employment opportunities in a different culture (Gullahorn & Gullahorn, 1963; Kohls, 1984; Oberg, 1960). As a consequence, current educational practice continues to be based on models using adult subjects who choose voluntarily to enter into the experience of crossing cultures (Aycicegi-Dinn & Caldwell-Harris, 2009). Therefore, the classic grounded theory study conducted during 2011-2012 allowed a basic social process to emerge that was both explanatory and enlightening regarding the stages and needs that transcultural children require in educational environments. The study conducted with 35 participants over the year long period highlighted that while schools are focused on a child's language development, the child is focused on attempting to bridge two distinct cultures, develop a new identity and blend into the new culture as comfortable as possible. Continued educational focus on child language development and proficiency diminishes the sociocultural development necessary for identity development (Dornyei, 2009). The finding of the core variable in the first stage of the research is accomplished by the systematic treatment of the data. The core variable sums up and explains the main concern (and its recurrent solution) of those being studied, and most of the variation in the data. The study is then delimited to concepts related to the core variable. This is equivalent to the finding of the research problem. As is evident in Figure 1, the basic social process was illustrative of the main concerns of the participants as they move through the core variable of *Learning the Rope*.

Figure 1. Learning the Ropes



A continued view that learning the language is the best means of acculturation diminishes the enormous human capital that may be lost in the process (Jaffe-Walter, 2008). In further evaluation, as schools implement greater reforms to meet the challenges of a global society replete with the need for cultural currency and sociocultural competency, children who have had to make this journey may provide educators with the best examples of how globalization is changing their classrooms and, consequently, the future of the nation these institutions serve.

3. Discussion

All educators, but most importantly language educators, need to understand the process children are going through as they not only learn the languages but acculturate to their new environments. Additionally they require professional development in discovering ways to work with students who are acquiring not only language but culture simultaneously. Furthermore, there needs to be a recognition that learners are using school settings to accomplish acculturation tasks and schools are left with students who may not be achieving and functioning academically to their highest potential. This, in turn, leaves children with unfulfilled promise for the future as well as trajectories for the future that do not match with the dominant culture, which, renders them to low paying and less than adequate employments and opportunities in the new culture.

Children crossing cultures lack information about how to best restructure their identity in the new culture so they can become participating members of the society. The lack of understanding of the needs of children crossing cultures is a failure on the part of the political entities tasked with equal opportunity for all through education, and from state and local community organizations that view certain populations as problematic and society as a whole that has somehow forgotten these are children attempting a process that is challenging and life altering. Current programs have met this challenge by assuming that language development holds the key to future success. But this demonstrates a lack of understanding about how language is used to construct and confirm personal identity in ways subtle and profound and how language ideologies within society shape a sense of national belonging.

References

- Abed, N. S., & Sheldon, K. M. (2008). Parental autonomy support and ethnic culture identification among second-generation immigrants. *Journal of Family Psychology*, 22(3), 652–657.
- Aycicegi-Dinn, A., & Caldwell-Harris, C. L. (2009). Emotion memory effects in bilingual speakers: A levels-of-processing approach. *Bilingualism: Language and Cognition*, 12, 291–303.
- Batalova, J. (2008, January). *Immigrant and ELL education: A demographic overview*. Paper presented at the ETS-NCLR Symposium: The Language Acquisition and Educational Achievement of English Language Learners, Princeton, NJ.
- Berk, L. E. (2006). *Child development* (7th ed.). Boston, MA: Pearson Education.
- Caldwell-Harris, C. L. (2008). Language research needs an “emotion revolution” and distributed models of the lexicon. *Bilingualism: Language and Cognition*, 11, 169–171.
- Dornyei, Z. (2009). *The psychology of second language acquisition*. New York, NY: Oxford University Press.
- Granger, C. A. (2004). *Silence in second language learning: A psychoanalytic reading*. Tonawanda, NY: Multilingual Matters.
- Gullahorn, J. T., & Gullahorn, J. E. (1963). An extension of the *u*-curve hypothesis. *Journal of Social Issues*, 19, 33–47.
- Jaffe-Walter, R. (2008). Negotiating mandates and memory: Inside a small schools network for immigrant youth. *Teachers College Record*, 110, 2040–2066.
- Kohls, R. L. (1984). *Survival kit for living overseas*. Yarmouth, ME: Intercultural Press.
- Mencken, K. (2008). *English learners left behind*. Tonawanda, NY: Multilingual Matters.
- Oberg, K. (1960). Culture shock: Adjustment to new environments. *Practical Anthropology*, 7, 177–182.
- Philip, J., Oliver, R., & Mackey, A. (2008). *Second language acquisition and the younger learner*. Philadelphia, PA: John Benjamin.
- Shohamy, E. (2006). *Language policy: Hidden agendas and new approaches*. London, England: Routledge Press.
- Spolsky, B. (2004). *Language policy*. Cambridge, England: Cambridge University Press.

- Taylor, J. T. (2004). Teaching children who have immigrated: The new legislation research, and trends in immigration which affect teachers of diverse student populations. *Multicultural Education*, 11(3), 43–54. doi:10.1080.02/me1118.3
- Trueba, H. T. (2004). *Raising silent voices: Educating the linguistic minorities for the 21st century*. Boston, MA: Heinle & Heinle.
- Woolfolk, A. (2009). *Educational psychology* (11th ed.). Boston, MA: Allyn & Bacon.

COMBINING BIOTECHNOLOGY AND MOLECULAR GASTRONOMY PROJECTS TO PROMOTE CAREER SUCCESS AND CREATIVITY OF NON-SCIENCE MAJORS

Paloma Valverde

Sciences Department, Wentworth Institute of Technology, Boston, MA (USA)

Abstract

Wentworth Institute of Technology is a primarily undergraduate teaching institution that offers a variety of STEM-related undergraduate programs, architecture and design. It emphasizes experiential learning and career success in the undergraduate curriculum by implementation of Externally-collaborative, Project-based, Interdisciplinary Curricula for Learning (EPIC-L) pedagogy and by inclusion of two required coops in all programs.

The Sciences department has also designed minors in biology, chemistry, physics or bioinformatics, to encourage students to perform authentic scientific research early in their STEM programs, guide them towards developing scholarly works in collaboration with sciences and engineering faculty and focus on their learning progress and career success.

In this work, the components of a 4-credits EPIC-L course named Directed Study in Biological Research is described. This course is part of the biology and bioinformatics minors and is taught entirely at one of the biology labs for a minimum of 6 hours per week since Fall12. Students taking this course were enrolled in first, second or third year of biomedical engineering, civil engineering and computer science programs. In this course just-in time informal discussions and assignments based on materials provided or posted on blackboard were used instead of traditional lectures. Biotechnology laboratory projects involved the use of living organisms (planarian, daphnia, bacteria or eukaryotic cells in culture) or a variety of biotechnology instrumentation for data collection and analyses. These projects were chosen by either the professor, the students or by external collaborators invited to the class. Molecular gastronomy projects are also being implemented this Spring 15 semester as take-home labs to be performed in students' kitchens in order to promote creativity and learning of advanced science topics not normally covered in our chemistry courses. Laboratory projects varied in their degree of inquiry with those of lower inquiry level being used to teach lab skills and provide practice in scientific writing whereas those of inquiry level 3 or pure research allowed students to use their own ideas with minimum guidance by the professor to research and present their work to the rest of the class and at different external or internal conferences. Examples of past and ongoing projects will be described, as well as the perception of learning gains from the students and the results of formative and summative assessments.

Overall this modality of directed research courses seem to help students gain hands-on biotechnology skills and scientific literacy while at the same time facilitates self-directed learning and team-work.

Keywords: *Learning, Laboratory Projects, Career-success, Creativity, EPIC-L*

1. Introduction

Over the past decade, undergraduate biology education has undergone important changes aimed at enhancing students' learning experience, motivation and retention. These include the introduction of active learning pedagogies (Allen, 2005), the use of diverse instructional technologies including virtual labs and multimedia (Valverde, 2012) and the inclusion of higher inquiry or a research component at an early stage of the curriculum (Weaver, 2008; Wood, 2009; Lopatto, 2009).

The apprenticeship model, in which students perform independent research projects with an individual faculty member's laboratory was reported to provide authentic research experiences to undergraduates in the biological sciences. Students in science and engineering majors were shown to gain specific skills including in research design, hypothesis formation, data analysis and information literacy (Lopatto, 2009; Seymour et al, 2004; Lopatto, 2010; Zydney et al, 2002). Additional personal gains have been reported, including independent thinking, self-confidence and a sense of accomplishment (Lopatto,

2009; Seymour et al, 2004; Lopatto, 2010; Zydney et al, 2002). Unfortunately the implementation of the traditional apprenticeship model cannot be easily implemented at small primarily teaching institutions in which faculty are assigned a teaching load of two or three courses per semester or research funds and laboratory facilities are not available. In addition to the apprenticeship model, several colleges and universities in the US have begun to integrate undergraduate research courses as part of the the undergraduate biology curriculum of sciences and non-sciences majors (Mitchell et al, 2006; DiBartolomeis, 2011; Wei, 2011; Brownell et al, 2012). Some of these courses do not require laboratory facilities nor involve laboratory experimentation or lab supplies and mostly emphasize the understanding of the research process to enhance students' critical thinking skills, scientific literacy or computational skills. Others require the use of laboratories and other major resources, but can help in the acquisition of a variety of technical and scientific communication skills for career enhancement. Although more difficult to implement than the apprenticeship model or traditional science lab courses with low inquiry, these research-like courses can expose students to evidence-based scientific research, encourage independent thinking and promote future collaborations and publications involving faculty mentors and interested students. One additional advantage of these research like-courses is that they could hypothetically enhance students' creativity, problem solving skills and team-work if students are encouraged to use the scientific method and the creativity-based engineering design method.

2. Design and Objectives

The goal of this study was to implement a one-semester research course that included a combination of biotechnology laboratory projects and molecular gastronomy take-home labs for non-sciences majors. Projects had different inquiry level in order to give non-sciences majors (mostly engineering students) the opportunity to integrate the scientific method and the engineering design method and to develop creative problem-solving skills while at the same time promoting their career success.

The objectives were:

Objective 1: To promote career success by providing undergraduate non-sciences majors with the opportunity to gain practice in a variety of technical and scientific communication skills that could be incorporated into their resume.

Objective 2: To encourage students' creativity and critical thinking skills upon implementation of the scientific method and the creativity-based engineering design process.

Objective 3: To collect students' feedback and learning reflections to evaluate whether these projects could be implemented in larger sciences classes in our department.

3. Methods

Wentworth Institute of Technology is a primarily teaching institution located in the city of Boston, MA USA (<http://wit.edu/about/index.html>). The department of Sciences develops and teaches sciences courses in physics, chemistry and biology for the wide variety of majors offered by the institute including engineering, management and design. Although the Sciences department does not offer programs in any scientific disciplines, it has developed minors in physics, chemistry, biology and bioinformatics (<http://www.wit.edu/sciences/minors/index.html>). These minors consist of 16 or 20 credits that include four credits of research-based lab courses with characteristics of authentic scientific research.

This paper describes the integration of biotechnology projects and molecular gastronomy projects as part of Biol406, a lecture-free research-based course named directed study in biological research, taught at one of the biology labs at Wentworth Institute of Technology since 2012. This course is part of the minor in biology (Miller et al, 2013) and the minor in bioinformatics (Werner et al, 2013). Because full-time and part-time faculty and staff of the department of Sciences teach all the sciences courses at our Institute, our department can only offer research-based courses when the labs or personnel are available. The average number of courses taught by faculty are 3 (12 credits) per semester, and 2-3 courses (8-12 credit) per year by each department chair. Five different pilot studies of the Biol406 course were implemented so far including during Fall 2012 (n=2 students), Spring 2013 (n=5 students), Spring 2014 (n=3 students), Summer 2014 (n=3 students) and Spring 2015 (n=2 students) semesters. The modular curricular structure of this course was previously described in detail for the courses taught during Fall2012 and Spring 2013 semesters (Miller et al, 2013; Valverde, 2013). The faculty mentor for this course has been the department chair of Sciences, who had prior teaching and research experience in different areas of biomedical research with or without involvement of undergraduate students.

Course registration was not restricted to students based on GPA or prior sciences courses taken. Eight out of the 15 students had a cumulative GPA of 2.7 or lower and the rest had a GPA between 3.1

and 3.9 (out of 4). Another important consideration is that students taking these courses were responsible for setting up their own experiments with the help of the professor, and therefore technical personnel or teaching assistants are not necessary if course caps stay below 20 students.

The biotechnology projects were taught since 2012 with kits and procedures developed by Biorad (<http://www.cpet.ufl.edu/wp-content/uploads/2012/10/Updated-pGLO-Transformation-Manual.pdf>; <http://www.bio-rad.com/webroot/web/pdf/lse/literature/4006099.pdf>; <http://www.bio-rad.com/webroot/web/pdf/lse/literature/10002461.pdf>).

Living planarians were obtained from Carolina biologicals (*Dugesia dorotocephala*, living; Item#132970) and simple experimental procedures for their immobilization and regeneration were initially done by following the manufacturers' recommendations. Complex experimental designs were based in planarian research articles (Robb et al, 2008; Lobo et al, 2012). The take-home molecular gastronomy projects were implemented for the first time during Spring 2015 semester by providing students with the Cuisine-R evolution molecular gastronomy kit, a small scale, a blender and pH paper indicator.

3.1. Development and implementation of laboratory projects of different inquiry level

As we previously described (Miller et al, 2013; Valverde, 2013), the first four weeks of the semester were fully dedicated to give students an introduction to chemical and biological safety and bioethics and to practice with solution preparation, use of common bioinstrumentation in a biotechnology laboratory and proper documentation and data collection techniques. During that introductory period, students were also guided to using living organisms (*daphnia* and planarian) to design and implement simple experiments of up to one week long.

During the remaining of the semester, students performed a series of biotechnology projects of inquiry levels 1, 2 (Buck et al, 2008) and independent projects of inquiry level 3 (Buck et al, 2008). Virtual labs from the concord consortium (example, <http://concord.org/stem-resources/dna-protein>), evaluation of the students' notebooks and take-home exams integrating the theory behind the laboratory work and data analyses were used as summative assessments. Another important component of the students' learning experience was implemented during the last six weeks of the semester, and consisted in researching a topic independently and giving an oral presentation in class that was part of the summative assessments of the course. The majority of the independent students' presentations consisted of extending the background information of the biotechnology laboratory projects and their applications, or researching a particular topic of their choice of global medical importance and of relevance to their career goals in order to present in class. During Fall2012 independent projects were focused in using planarians as a suitable model system to practice bioinformatics and molecular biology techniques and to study stem cell regeneration and cancer (Miller et al, 2013; Robb et al, 2008; Lobo et al, 2012). During Fall2013, Spring 2014 and Summer 2014, independent projects were focused in fluorescence applications, synthetic biology, tissue regeneration, disease therapeutics and design of medical devices. During Spring 2015, independent projects consisted in evaluating the effects of a variety of chemicals in planarian asexual reproduction, formation of two heads and regeneration upon injury by using research literature (Lobo et al, 2012) for presentation in class. During Spring 2015, students also worked independently in performing take-home molecular gastronomy experiments throughout the semester that were evaluated as part of take-home exams. To that end, students working in groups were provided with a molecular gastronomy kit. This project was intended to encourage our engineering students to use their creativity in implementing a series of biochemistry reactions with hydrocolloids (spherification, gelification and emulsification) with ingredients of their choice and troubleshoot when reactions did not work. Students included colorful pictures of experiments that worked and those that did not work in the take-home exams, described the procedures and repeated the experiments as needed by modifying appropriate variables. Students were also instructed to write a lab report in groups of up to two students or to submit an abstract to a peer-reviewed conference. Nine out of the 15 students taking this course submitted abstracts to different conferences and presented their work after the conclusion of the course. Formative assessments for all projects consisted of regular in-class discussions of bibliography or data analyses followed by recommendations to read a particular research or educational article or to repeat the experiments when results were inconclusive or proper controls were missing from the experimental designs.

3.2. Learning reflections and students' perceptions of learning gains

Towards the end of the semester, students were instructed to submit a learning reflections essay about the different component of the class and to rate their perceived learning gains according to a scale of 0 to 5 (Table 1). The learning reflections essay suggested that the biotechnology projects involving PCR, molecular cloning, protein expression and purification were found the most helpful by students in

order to add new laboratory skills to their resumes and apply for coop positions or graduate school. Interestingly, the molecular gastronomy experiments and the projects involving planarians (of different complexity depending on the semester in which the course was implemented) seemed to be the ones that motivated students to be more creative and encouraged them to work more hours outside of class or to spend extra lab time to collect the data or to read scientific literature (even when it was not assigned by the professor). When evaluating the students' perceptions of learning gains (Table 1), the best ratings were given to gains in research skills and insight into the research process, and gains in personal, professional and career goals.

Table 1. Students' Perceptions of Most Important Things Learnt from the Biol406 Course

Categories [#]	Ratings [§]
<i>Gains in Scientific Dispositions and Habits of Mind</i>	
Patience and Focus	4.3±0.7
Persistence and Perseverance	4.2±0.5
Organization and Planning Ahead	4.7±0.6
Motivation, dedication and commitment	4.5±0.7
Lifelong learning and keeping up with advances in the field	4.4±0.5
Learning from mistakes and accepting setbacks	4.7±0.7
Seeing the big picture and goal-oriented thinking	4.6±0.5
<i>Gains in Research Skills and Insights into the Research Process</i>	
Content knowledge and Laboratory Skills	4.9±0.5
Critical thinking and problem solving abilities	4.5±0.7
Making cross disciplinary connections and linking theory to real-life experiences and to your major of study	4.3±0.7
Develop a testable hypothesis, design controlled experiments, analyze data and synthesize conclusions	4.8±0.5
Use scientific publications and extrapolate valuable information for a given project	4.7±0.4
Communicate results orally or in writing	4.5±0.5
<i>Personal, Professional Gains and Career Goals</i>	
Sense of enjoyment, fun and passion	4.8±0.6
Collegial relationships with faculty, peers and laboratory personnel	4.9±0.5
Resume builder & Potential for publications	4.8±0.4
Perceived self-efficacy and pride in accomplishments	4.6±0.6
Worked independently and as part of a laboratory team	5.0±0.0
Think independently	4.7±0.5
Reassured my intention to go to graduate school	4.2±0.8
<i>Negative Insights</i>	
Increased insight into the unpredictability and frustration associated with the process of research	4.0±1.0
Research projects normally take more than one semester to implement	4.1±0.7

[#]The categories used in this Table were adapted from those used by other authors in similar studies (Kardash et al, 2008). [§]Values shown represent the averages and the standard deviations from anonymous students' responses from 2012 to 2015. Possible answers were strongly agree (5), agree (4), neutral (3), disagree (2), strongly disagree (1) and does not apply (0). Previous reports have shown the responses from students participating during Fall 2012 semester (Miller et al, 2013) and from Fall 2012 and Spring 2013 semesters (Valverde, 2013).

4. Conclusions

This study suggest directed research courses that combine laboratory projects with different level of inquiry that can be implemented by using the scientific method or the engineering design method help undergraduate students gain technical skills and scientific literacy while at the same time facilitate self-directed learning and creative problem-solving skills. Although the lowest average course grades correlated with the lowest cumulative GPA average (data not shown), and the most productive students had the highest cumulative GPA (data not shown), it is highly recommended that admission to these courses is not restricted by students' GPA due to the multiple learning benefits to undergraduate students, who in this study were non-sciences majors. Since these courses can be counted as part of the faculty's teaching load and can lead to scholarly works by the faculty and the students, implementation of this modality of undergraduate research seems ideal for primarily teaching undergraduate institutions.

References

- Allen, D., Tanner, K (2005) Infusing Active Learning into the Large-Enrollment Biology class:Seven strategies, from the Simple to Complex. *Cell. Biol. Educ.* 4, pp.262-268.
- Brownell SE, Kloser MJ, Fukami T, Shavelson R (2012) Undergraduate Biology Lab Courses: Comparing the Impact of Traditionally Based "Cookbook" and Authentic Research-Based Courses on Student Lab Experiences. *Journal of College Science Teaching*, Vol.41, No. 4, 36-45.
- DiBartolomeis SM. (2011) A semester-long project for teaching basic techniques in molecular biology such as restriction fragment length polymorphism analysis to undergraduate and graduate students. *CBE Life Science Education*, Vol 10, 95-110.
- DNA to Protein*. (2010, September 10). The Concord Consortium: <http://concord.org/stem-resources/dna-protein> (retrieved 12th April 2015).
- Kardash CM, Wallace M, Blockus L (2008) Science Undergraduates' Perceptions of Learning from Undergraduate Research Experiences. In: Miller, R.L., Rycek, R.F.,Balcetis, E.,Barney, S.T., Beins, B.C., Burns, S.R., Smith, R., & Ware, M.E., (eds), *Developing, Promoting, & Sustaining the Undergraduate Research Experience in Psychology*.
- Lobo D, Beane WS, Levin M (2012) Modeling Planarian Regeneration: A primer for Reverse-Engineering the Worm. *Plos Computational biology*, Vol8, Issue 4, e1002481.
- Lopatto D (2009) Science in Solution: The impact of undergraduate research on student learning. http://web.grinnell.edu/sureiii/Science_in_Solution_Lopatto.pdf (retrieved 12th April 2015).
- Lopatto D (2010) Undergraduate research as a high-impact student experience. *Peer Review* 27-30.
- Mitchell BF, Graziano MR. (2006) From organelle to protein gel: a 6-wk laboratory project on flagellar proteins. *CBE Life Science Education*, Vol 5, 239-246.
- Robb SMC, Ross E, Sanchez-Alvarado A (2008) SmedGD: the Schmidtea mediterranea genome database. *Nucleic Acids Research*, Vol.36, D599-D606.
- Seymour E, Hunter A-B, Laursen SL, Deantoni T (2004) Establishing the benefits of research experiences for undergraduates in the sciences: first findings from a three-year study. *Wiley Periodicals, Inc. Sci Ed* 88, 493– 534.
- Valverde P (2012) Use of virtual and wet laboratories in blended teaching and learning of undergraduate biology courses. 6th International Technology, Education and Development Conference Proceedings, ISBN:978-84-615-5563-5, pp 551-559.
- Valverde, P. (2013) Applying SENCER principles to sciences minors at a polytechnic institute without sciences majors http://www.sencer.net/Symposia/documents/WIT_ApplyingSENCERprinciplestoSciencesMinorsat aPolytechnicInstitutewithoutSciencesMajors.pdf (retrieved 12th April, 2015)
- Weaver GC, Russell CB, Wink DJ (2008) Inquiry-based and research-based laboratory pedagogies in undergraduate science. *Nature Chemical Biology*, 4, 577-580.
- Werner M, Russo J, Wu H, Rilett D, Ahrabi A, Grove L, Dow D, Valverde, P. (2013) http://biowit.cs.wit.edu/polytechsummit2013/V8_Final%20Draft_PolytechSummit%202013_Bioinformatics_All%20Panel%20Members.pdf (retrieved 12th of April, 2015).
- Wei CA, Woodin T (2011) Undergraduate Research Experiences in Biology: Alternatives to the Apprenticeship model. *CBE Life Science Education*, Vol 10, 123-131.
- Wood WB (2009) Innovations in teaching undergraduate biology and why we need them. *Annual Review of Cell and Developmental Biology*, 25, 93-112.
- Zydney, A. L., Bennett, J. S., Shahid, A., & Bauer, K. W. (2002). Impact of undergraduate research experience in engineering. *Journal of Engineering Education-Washington*, 91(2), 151-158.

TRANSFORMING PRIMARY EDUCATION AND PEDAGOGY – THE CASE OF SCHOOL GARDENS IN DENMARK

Pernille Malberg Dyg

*Department of Nutrition and Midwifery, Faculty of Health and Technology,
Metropolitan University College (Denmark)*

Abstract

School gardens spreading across Europe can make an important contribution to the transformation of primary education. The dissemination of school gardens in Denmark is a result of trends in urban farming and a farm-to-table and gastronomy focus in the country combined with a recent school reform. It is supported by an evaluation from 2011 of the gastronomic school garden program, Gardens for Bellies, which showed positive effects on children's food knowledge and ecological literacy. This new research study investigates the pedagogy in new school garden set-ups as well as the effects on children's learning. The research is based on qualitative, explorative studies of four different school gardens. The study investigates children's self-perceived learning and teachers' and garden educators' perception of pedagogy and learning opportunities, including the integration in the curriculum. It is based on garden observations, interviews with teachers and garden educators and focus group discussions with children two months after the programs were completed. Preliminary findings show that children benefit from learning in a school garden. Not only do they feel more motivated about being taught outside, they are also better able to understand complex connections and concepts; garden-based learning is perceived to be more exciting. The students' perceived ownership of the garden experience and harvest and understanding of the seed-to-table process, pollination and biodiversity leave the biggest impressions on the children afterwards. New ways of organizing school gardens open up opportunities for involving teachers more, integrating the learning back in the school and bringing about innovative changes in primary education as a whole. The garden classroom and motivated educators improve children's willingness to learn and connectedness to nature.

Keywords: *School gardens, garden-based learning, innovative teaching, ecological literacy, food literacy.*

1. Introduction

A growing number of children and youth lack a connectedness to nature and being physically activity. Research shows that they lack an understanding of where food is coming from, of seasonality, sustainability and the food system (Dyg, 2014; Chenhall 2010; Lang, Caraher 1999, Caraher, Dixon et al. 1999 Barton, Koch et al. 2005; Hess, Texler 2011). At the same time, the world is faced with devastating environmental destruction and economic uncertainty, which demand sustainable solutions for all areas of our daily lives. Innovative and holistic solutions to these challenges demand new knowledge, skills, competencies, commitment as well as interdisciplinary thinking, some of which school gardens and related training can foster. The school garden setting and outdoor hands-on learning also provides a learning space conducive for reaching a broader range of children and youth with different learning styles, needs and backgrounds. It enables a learning space for doing investigations and experiments on various nature elements and working with plants, conducive for learning valuable academic knowledge, including science and to develop practical gardening skills. The activities also help children to be self-efficient and build confidence in their future (Walicze et al, 2001; Rahm, 2002; Dyg, 2014).

Adding to the yet still limited international research on school gardens from Europe, Wistoft et al (2011 and 2014) investigated the Gardens for Bellies school garden program in a municipality in Denmark showing successful experiences by teachers and pupils. Since then there has been a strong movement and political willingness to establish school gardens across the country. This coincides with the Danish School Reform from 2014, which focuses on alternative and experiential teaching methods, more teaching hours and daily physical activity all of which open doors for integrating garden activities

and other outdoor pedagogy at large scale across the country. With this growing attention in Denmark on garden-based learning and experiential teaching methods, Gardens for Bellies was allocated funds to disseminate school gardens across Denmark from 2014-2016.

2. Objectives

The objectives of the research is to investigate children's self-perceived learning and teachers' and garden educators' perception of pedagogy and learning opportunities, including the integration in the curriculum. Secondly, the initial findings will be used to identify recommendations as to how school gardens contribute to transforming the educational system in a more interdisciplinary and sustainable direction.

3. Methods

The research follows the implementation of five school gardens from 2014-16 out of more than ten school garden programs, which are currently being initiated in municipalities across Denmark. The selection criteria for the school gardens include differences: 1. geographically, 2. the physical location of the school gardens (urban, rural, on a farm and on school grounds), and 3. in the stakeholders involved and organizational set-up.

Based on these criteria, five different school gardens have been selected of which four at present have been investigated, due to different start-up dates. The research is based on qualitative and explorative studies of the school gardens, involving field observations, interviews with garden educators, teachers, decision-makers at school and municipal level, participation in workshops with teachers and garden educators, as well as focus group interviews with pupils two months after the completion of the school garden program, which involved 6-8 visits to the garden.

The first school garden is located on a private organic farm in a rural area close to Copenhagen with a professional gardener, chef and nature guide teaching children about gardening, the nature around the farm, farm animals, bees and pollination, and cooking. With partial municipal funding, schools across the municipality visit the farm by train. The second school garden setting is an urban area, where the municipality has supported the establishment of three school gardens in or near the city. The main school garden is located in a nature center near a lake in a peri-urban area with nature guides and others with a pedagogical background teaching about gardening, nature, farm animals and cooking. The third is located at a school, where teachers and students across subjects and grades. 7th graders were involved in building the school garden from the very initial steps. The plan is that the school garden should be an offer to all interested teachers to use it in their subjects. The actual teaching is expected to start after August 2015. The fourth is in a rural municipality, where the plan is to set up school gardens in rural towns across the municipality. A pilot garden was initiated next to a small community garden in a rural town, where three teachers use the garden to teach science, home economics and Danish language. Students cook in the school garden and back at the school and sell some of the harvest in the school shop. A fifth garden project will be investigated in the coming season. This garden project is a community garden, which will be set up in three apartment areas with a high percentage of low-income and ethnic minority residents. It will involve all residents, including schoolchildren.

4. Findings

The initial findings from the research, which is not yet completed, are presented below with an emphasis on the impact of the outdoor setting, the pedagogy used in the gardens and the learning in the gardens as it is perceived by the children themselves, the teachers and garden educators.

4.1. The impact of the outdoor setting on teaching and learning

Interviews with teachers, students and observations of teaching in the gardens show that outdoor learning space in a school garden provides a spacious environment and sensory impressions that children thrive in and find fun and educational to be in. The opportunity for free play between the various activities, learning in nature and being outside in fresh air is something the pupils appreciate; not being confined to a chair and four walls all day. This is even the case when the weather is cold and rainy. Although observations during a day in the garden with wind, rain and cold showed that the children's attention to the garden educator is reduced when trying to keep warm, in hindsight the pupils do not recall poor weather to be a problem. Nonetheless the attention and learning of the pupils on those cold days is clearly reduced. The open space can, however, also be a challenge for some teachers due to the lack of

structure and control the open space affords. Especially the teachers taking their pupils to the farm-based school garden highlighted the need for more defined 'space' in the garden: places in the garden to sit down and eat, hold group sessions, get shelter and avoid the children running around everywhere.

The four different garden settings offer different opportunities for learning. Two of the school gardens provide the opportunity to learn about animals and agriculture. Both have livestock and one is located close to a dairy company, where pupils can make their own yogurt. The school gardens also have bee hives, which enable teaching about pollination and the importance of bees for the ecological cycle and agriculture. The two school gardens located on or within walking distance from the school enable more frequent teaching in the garden and for the teachers to only spend one to two lessons in the garden instead of an entire school day. Here it is the teachers who themselves are using the school garden as an outdoor alternative classroom. The science and Danish teacher in the pilot school garden finds it much easier to teach pollination, fertilization and ecology than normally through a book. She also works with developing her pupils' writing skills and work with fiction in her Danish language classes. Here her pupils write a story in the garden, where they bring a flower or pumpkin to life through writing and doing puppet shows with some of the crops.

4.2. The garden-based pedagogy – opportunities and challenges

Different forms of pedagogy applied in the school gardens are largely connected to the background of the various educators involved in teaching in the gardens. As mentioned, in two of the gardens it is teachers who teach (or will be teaching) in the gardens, whereas in the two other school garden programs, the educators are so-called experts: a gardener, a chef, a nature guide, a beekeeper and educators with a broader background in health and pedagogy at the nature center. This is reflected in the pedagogy. The 'experts' can have a greater professional focus, which can both be received by the pupils as being qualified and captivating to be taught by a real chef, farmer or nature guide with stories that catches the children's interests. However, it can also have the risk of being too complex for the children to comprehend. Although none of the 'experts' have a background in pedagogy, they have a strong focus on what they call an "appreciative" approach. They define this as not yelling at the children, giving the children recognition for what they do and focusing on their successes and learning from their mistakes. This can according to these garden educators clash with some teachers, who they feel often yell too much at the children in the garden, *"adopting the same approach of yelling and needing to have control over the pupils as they do back at the school"*. In the nature center, where the educators have a pedagogical background limited time is spent talking or teaching. Time is spent on children's own hands-on activities, indicating a clear focus on experiential learning.

In the first Gardens for Bellies program established in 2006, where the municipality made the school garden program mandatory for all primary school students, teachers often take on a rather passive role while in the garden: primarily one of keeping an eye on the pupils. This was not something that was articulated elsewhere even in the two school gardens with 'expert' garden educators, which the first Gardens for Bellies program also employs. Teachers themselves felt they had a lot of functions in the school garden both with teaching, but also taking care of the more pedagogical aspects, like group dynamics and life skills. It can still be a challenge to find time to work on the themes the pupils worked with in the school garden back in class. Some of the teachers have given their pupils a logbook, which they will use during the process to write their experiences and reflections down.

4.3. Learning opportunities

The teachers and children themselves mention that cultivation, knowledge of different vegetables and the direct understanding and connection from farm to table are the key learning potentials of school gardens. The children's after-reflections after two months about what they learnt show that they highlighted learning how to grow vegetables, the process from seed to table, learning about bees and pollination, different varieties of vegetables, which they did not previously know and fertilization. They also stressed that learning new flowers and names of other plants in nature had been exciting. The children could easily explain what they learned in the school garden and how it was related to subjects in school, especially science, but also Danish language, home economics and mathematics. They saw in other words a direct relevance to their academic learning and unanimously agreed that it was more exciting to learn about these subjects in the school garden. However, some teachers mentioned that for children who need more structure, it can be harder to be out in a school garden. For one boy, who was very strong academically and keen on computers, the school garden was "nothing special". He explained that he would rather be at the school. Also some of the children with different diagnosis like ADHD and autism had mixed feelings about the school garden. Some of them enjoyed the outdoor setting and others were easily distracted.

The children all showed great interest in cooking outside on fire. It was rewarding to cook with vegetables they had grown themselves that “*were not just purchased from the supermarket*” as several highlighted. The outdoor made it more fun and easier to experiment and children were more willing to try the food when they had grown vegetables, cooked the food themselves and made it over a fire. Some of them attached some success experiences with growing and cooking vegetables, because they themselves were responsible for it: making it taste good and not always having to follow a recipe. Taste is emphasized: children taste the food that they make and the nature around school gardens, where the nature guide gave them the opportunity to taste sea buckthorn, blackthorn and even mealworms. This is a good example of how children learn with all their senses: not just sight and sound but also with their feelings, taste and smell. Daring to try something new that is sour, perceived to be disgusting or dangerous, takes the children out of their comfort zone to exceed their own boundaries, which when they do, they perceive as exciting, they get recognition from their peers and experience it as a personal accomplishment.

5. Discussion

An important objective is to highlight how school gardens can contribute to transforming primary education in a more interdisciplinary and sustainable direction giving children skills needed to act in an environmentally, socially and economically sustainable manner. School gardens give them an understanding of and an interest in nature, which shows them that they are connected to nature in a very direct way. They develop a respect for nature and all its components and learn that they are mutually dependent: all is essential for acting in a more sustainable manner. Understanding complex connections and scientific concepts, such as biodiversity, ecology, pollination and seed-to-table processes and their relevance for children’s daily lives are fundamental for understanding the concept of sustainability. Developing skills on how to grow food and cook are essential skills for living a healthy and sustainable life later on in life.

The school garden acts as a real life setting not just to teach about sustainability and science, but also where different subjects can be taught in a hands-on experiential and interdisciplinary manner, where different subjects become more relevant and exciting for the children to learn about. The excitement for learning and experiences of success, which the children revealed pertaining to their experiences in the school gardens, is exactly what is missing for some children with less academic aptitude. The school gardens offers a unique opportunity to attract more children to be interested in science, which is found to be a challenge in many countries including Denmark (Desmond, Grieshop et al. 2004, Skelly, Bradley 2007, Wistoft 2013; Dyg 2014). Going from a theory-driven, teacher-controlled and closed teaching environment at the school, to learning based on an interaction between theory and practice, which is student-driven, and based on a real-life, place-based learning environment is contributing to transforming education. What the children learn in the gardens are important foundations for understanding sustainability later on during their education and in life.

One of the key challenges of many school gardens is involving teachers in activities to ensure that what the children learn in the gardens is followed up in the classroom and later on in their education. The new ways of organizing school gardens in the four cases open up for better opportunities for involving teachers. Teachers are integrated better in the planning of the school garden program, they are given more responsibility for certain activities, and there are more cases of school gardens located on schools or in the vicinity of the school, where the teachers are also the garden educators. There is, however, still room for further improvements.

What policy implications do the promotion of and dissemination of school gardens have? Experiences from Denmark show that it is vital that school gardens are supported politically and financially by municipal and national governments, in order to ensure that there is a long-term ownership and support for school gardens in the municipalities. School gardens cannot run successfully long-term, unless they are incorporated into the municipalities’ educational strategies and allocated secure long-term support. In most municipalities in Denmark with school gardens, they are backed by municipal support: they are explicitly written into the educational strategies of the municipality and have some sort of long-term municipal support, either in-kind (e.g. land), support to salaries for staff or as a financial support, so that each school does not have to pay the full amount to participate in the school garden program.

What has been of key importance in the development of school gardens in Denmark is strong political emphasis on alternative teaching methods and connections between schools and the surrounding society in the national school reform. To prepare and equip teachers with appropriate skills to use school gardens it is critical that resources and time is set aside to train teachers in the opportunities and tools to use school gardens in their teaching. Pedagogical principles and tools in outdoor pedagogy and Education

for Sustainable Development are essential. This takes us to the need to revisit the core purpose of education and the educational system. The main underlying goal of school gardens is not to enhance science aptitude and promote more effective learning to ensure a more productive and skilled future workforce. Rather school gardens need to go hand in hand with a reorientation of the underlying purpose of education: namely to engage future citizens in actions, which connect to nature and promote rather than threaten a democratic, socially and economically just, and environmentally sustainable society. In Finland, the overall purpose of the school system was changed to one of promoting the well-being for all, protection of nature, and building a sustainable future. Thus, there is a need to reconsider the underlying purpose of the educational system to match societies' need for a sustainable societal transition.

6. Conclusion

Children benefit from learning in a school garden. They are better able to understand complex connections and concepts; the seed-to-table process, pollination and biodiversity leave impressions on children afterwards. Not only do they feel more motivated about learning outside, garden-based learning is perceived to be more exciting and fun. The garden classroom and motivated educators improve children's willingness to learn and connect to nature. The connectedness to nature, seeing oneself as part of a bigger ecological cycle and the ability to think holistically and work inter-disciplinarily are all key components of Education for Sustainable Development. The school garden setting offers a possibility for promoting a stronger interaction between theory and practice, learning that is student-driven, and based on a real-life, place-based learning environment, which can contribute to transforming education. This learning is an important foundation for sustainable living. School gardens need to be supported politically at municipal, national and internationally by making them part of a wider change in educational strategies.

References

- Barton, A.C., Koch, P.D. and Contento, I.R., 2005. From global sustainability to Inclusive education: Understanding urban children's ideas about the food system. *International Journal of Science Education*, 27(10), pp. 1163-1186.
- Caraher, M., Dixon, P., Lang, T. and Carr-Hill, R., 1999. The state of cooking in England: the relationship of cooking skills to food choice. *British Food Journal*, 101(8), pp. 590-609.
- Chenhall, C., 2010. *Improving cooking and food preparation skills - A synthesis of the evidence to inform program and policy development*. Canada: Healthy Living Issues Group of the Pan-Canadian Public Health Network.
- Dyg, P.M., 2014. Fostering Food Literacy and Food Citizenship through Farm-School Cooperation and beyond: Theoretical Perspectives and Case Studies on Farm-School Cooperation and Food and Agriculture Education. Ph.D. dissertation, Department of Planning and Development. Aalborg University, Denmark.
- Desmond, D., Grieshop, J. and Subramaniam, A., 2004. *Revisiting garden-based learning in basic education*. Rome, Italy: Food and Agriculture Organization of the United Nations.
- Hess, A. and Texler, C., 2011. Qualitative study of agricultural literacy in urban youth: Understanding for democratic participation in renewing an agri- food system. *Journal of Agricultural Education*, 52(2), pp. 151-162.
- Lang, T. and Caraher, M., 1999. *Cooking skills and health*. London, England: Health Education Authority.
- Skelly, M.S. and Bradley, C.J., 2007. The growing phenomenon of school gardens: Measuring their variation and their effect on students' sense of responsibility and attitudes toward science and the environment. *Applied Environmental Education and Communication*, 6(1), pp. 97-104.
- Waliczek, M.T., Bradley, C.J. and Zajicek, M.T., 2001. The effects of school gardening on children's interpersonal relationships and attitudes towards school. *HortTechnology*, 11(3), pp. 466-468.
- Wistoft, K., 2013. The desire to learn as a kind of love: Gardening, cooking and passion in outdoor education. *Journal of Adventure Education & outdoor Learning*, 13(2), pp. 125-141.
- Wistoft, K., Otte, C.M., Stovgaard, M. and Breiting, S., 2011. *Haver til Maver - Et studie af engagement, skolehaver og naturformidling*. Copenhagen, Denmark: Institut for Uddannelse og Pædagogik, Aarhus universitet, Denmark.
- Rahm, I. (2002): Emergent learning opportunities in an inner-city youth gardening program, In: *Journal of Research in Science Teaching*, Vol. 39, No. 2, pp. 164-184.

TIME TO LEARN: ADAPTING TEACHING TIMETABLE FOR LEARNING IMPROVEMENT

Mario Campanino, Maeca Garzia, Giuseppina Rita Mangione & Maria Chiara Pettenati
INDIRE-Istituto Nazionale di Documentazione, Innovazione e Ricerca Educativa (Napoli-Italy)

Abstract

Nowadays, school is called to organize the curriculum in order to allow the acquisition of long lasting competences and skills. This causes the parallel need of adapting various teaching/learning dimensions (time, space, methods) in everyday school activity.

Objective of our research is to elaborate a theoretical framework and to experiment two innovative educational models aimed to transform the temporal organization of teaching and learning. Both models are validated in the framework of EDOC@WORK3.0 (Education and work on cloud), a research project aiming at innovating education at a system level under different aspects: environments, languages, tools and content, also introducing cutting edge technologies.

The first model, called Block Scheduling, concerns the distribution of disciplines in the curriculum all along the school year. Following this model, the teaching schedule of some disciplines is concentrated in the first half of the year, whereas other disciplines are concentrated in the second half of it. This offers the opportunity of integrating traditional lessons with lab activities, workshops, etc., and allows students to go deeply into specific arguments and topics.

The second model, called Spaced Learning, consists in a kind of lesson where they are interpolated three 'inputs' moments and two breaks. The first two 'inputs' are traditional content presentations, whereas the last one is dedicated to assessment. The interpolation of two 10-minute breaks between the input moments is supported by recent discoveries about brain functioning, that show the two breaks would contribute to the embedding of information in long-term memory.

Results of researches show that both models are efficient but present some weak aspect. The Block Scheduling model presents big challenges with regard to the lack of flexibility in teacher/school time organization, due to teacher contractual constraints, etc., whereas the Spaced Learning model requires a hard micro-planning of every phase, that asks a greater effort to the teachers.

With regard to both models, INDIRE research team has set up a 5-step activity program within the research and experimentation phase of EDOC@WORK3.0: 1) a systematic scientific review that sustain the pedagogical value of time in education; 2) case studies on school institutions that have experimented innovative models and practices; 3) teacher training programs addressed to make educators able to profitably apply the selected models; 4) field testing with direct observation and data collecting; 5) evaluation of teaching/learning processes and educational results.

Keywords: *Adaptive teaching, innovative learning, pedagogical templates, time.*

1. Research context and objectives

The concept of competence teaching moves today pedagogical research in the effort of finding new ways to organize the curriculum and to design learning activities in classrooms. This highlights the need to rethink the dimensions that characterize an educational act (e.g.: time, space, embodiment) and to adapt them in order to favour a differentiation in disciplinary teaching.

In the framework of EDOC@WORK3.0¹ Project (Research & Competitiveness National Operative Programme 2007-2013: Smart Cities and Communities and Social Innovation) INDIRE, the Italian National Institute for Educational Research and Innovation, aims to create the conditions for the identification and formalization of pedagogical patterns that refer time-based innovative models and practices to be acted in the context of teaching, also exploiting new possibilities coming from the use of digital educational technologies.

¹Web site: www.edocwork.it/home

After the introduction about the educational and cultural frame of the research and experimentation project, the paper is articulated as follows: section 2 explores the pedagogical cornerstones behind the idea of time as a function of learning; section 3 focuses on two educational models that maximize the value of time dimension in learning: Block Scheduling and Spaced Learning; finally, in section 4 we will present the first results of this research project – two ready-to-use pedagogical templates for teacher self-training, that present the two models in a very transferable and adaptable *routines* with respect to students' differences (Nuzzacci, 2014) – and the future steps for the implementation of the field testing.

2. Time and effectively teaching: pedagogical backgrounds

Time is a critical dimension of the curriculum and of learning. In a recent report (Baker et al., 2014) the authors examine the influence of time on learning outcomes in an international perspective. What they consider fundamental is not the linear relationship between time spent on lessons and learning outcomes, but rather the need to understand how time dimension – from an adaptive point of view and in the direction of personalizing the educational offer – can drive a review of curriculum, educational schedule and teachers' teaching action.

Time dimension is one of the elements that can trigger a process of *schools' adaptability* able to guarantee opportunities for success and development of individuality. The distinguishing feature is precisely based on teacher's ability to meet the specific individuality of each student. This ability is commonly referred to as *teaching adaptively* (Corno, 2008). Then, we need 'to *capture the adaptive strategies*' to foster the manipulation of all elements able to drive practices of micro and macro 'adaptive teaching'. As a concept, adaptive education can be actually defined as the use of alternative formal-or-non-formal educational strategies in the framework of a curriculum, that are able to meet students' needs. As Wang (1992) suggests, 'creating effective, practical school learning environments that are responsive to the diverse needs of students has been a continuing challenge in school reform efforts' (p. 1).

Connections between learning and time management are one of the most studied topics in psychology of education (Fredrick & Walberg, 1980). Many studies demonstrate a strong and positive influence of time on learning and the adaptive dimension in the perspective of an 'effective teaching' (Wang, 1984). As many authors underline (Walberg et al., 1994), 'along with effective teaching productive time engenders learning. Time should be a central concept in curriculum theory and practice' (p. 86).

The theme of time optimization compared to interruptions that can be functional or not to long-term memory, as well as time customization for carrying out complex tasks and for the study of particular disciplines, have been the subjects of numerous studies and investigations. Particularly, Leonard's works on instructional time (Leonard, 1999), those by Lasley on 'time on task' (Lasley & Walker, 1986), and those that start to ask about the influence of individual dimension on the relationship between time spent on learning (TSL) *vs* time needed for learning (TNL) and on the impact of this relationship on students' achievement (Gettinger, 1984), have fostered a theory of time as predictive factor of 'educational productivity'. These studies are the basis of modern theories that revalue the time as an element for learning activities in the classroom. Reflections on the efficient utilization of time in education and on Block Scheduling in the curriculum (Patall et al., 2010) on one side, and the attention to micro management of time in experiences based on Spaced Learning (Kelley & Watson, 2013) or on learning interruptions through the 'erosion teaching time' (Leonard, 2009) on the other, bring us to ask about new educational models planned and managed on the base of a different utilization of time and space in teaching/learning activities. As a further step, these innovative models need to be expressed in form of 'pedagogical template' (sequence of scripts or information, also said 'pedagogical patterns') that could be easily used by the teachers during the educational planning and under the different principles of personalization and inclusion.

For these reasons, in these paper we deeply study the two models of Block Scheduling and Spaced Learning, and then go through the individuation of main international cases and practices helpful to shape these models in form of instructional templates.

3. Two innovative educational models

3.1. Block scheduling

Block Scheduling consists in an uneven distribution of the schedule of two or more disciplines throughout the school year. The most classic type of Block Scheduling (Total Block Scheduling) requires that a subject is taught only in the first half of the year, increasing the hours of weekly teaching. These

hours are subtracted to the teaching of another subject, that is taught only in the second half of the year when the teaching of the first subject ends, always increasing the weekly teaching hours. It is also possible to adopt an asymmetric or partial form of Block Scheduling, when there is not an equivalent division of subject hours between the first and second half of the year (e.g., $\frac{2}{3}$ of the total hours are taken in the first half of the year, and $\frac{1}{3}$ in the second half). By adopting Block Scheduling, both in total and in partial form, the amount of hours per year of each subject remains unchanged: what changes is its distribution in the course of the school year, as some subjects are concentrated in the first half and others in the second half of it.

Gordon Cawelti (1994) defines Block Scheduling as follows: 'At least part of the daily schedule is organized into larger blocks of time (more than sixty minutes) to allow flexibility for a diversity of instructional activities.' (p. 23) Different kinds of experimentation of Block Scheduling were carried out in US since the nineties. As reported in Lindsay (2013), according to some researchers the Block Scheduling is a form of experimentation that comes from the 'Modular Scheduling concept', experienced in US in the seventies and eighties, and then abandoned. American experience on this theme points out many possible variations (McLeod, Fisher, & Hoove, 2003), among which:

- Four-by-four: school year divided into two semesters; former year-long courses completed in one semester.
- Two large blocks and three standard-sized blocks per day: year divided into sixty-day trimesters with a different subject taught in the large blocks each trimester.
- Some classes (such as band, typing, foreign language) taught daily, others in longer blocks on alternate days.

Block Scheduling is one of the ways through which school seeks to fulfil several objectives: finding new ways to facilitate learning activities of the students; making up the reduction in time that have undergone some disciplines; knowing more about students and their learning needs; reducing the number of subjects to be studied in the same period, in order to improve and enhance the quality of attention and commitment of students compared to the proposed activities. But, first of all, Block Scheduling permits the adoption of different teaching methodologies. Indeed, to reorganize the school day on the base of time blocks longer than traditional, means to have more time to daily carry out practical activities, discussion-based lessons, large and small group alternation, and notably Spaced Learning-based activities, that is one of the reasons for which the two models are presented together in this paper.

Despite the evident advantages that Block Scheduling brings in practical and organizational terms, positive results on the learning side are yet to be fully proved. Results of the case studies here considered seem good: both initial cases such as that of Angola High School in Indiana, US (Snyder, 1997) and more recent studies on High Schools of Central California (Williams, 2011) demonstrate that the model has positive impact in educational terms. But some other observations (see for example Mell, 1996, Bennett, 2000, Lindsay, 2013) appear to question the validity of the method, which therefore requires further study and experimentation.

3.2. Spaced Learning

Spaced Learning (SL) is a particular approach, outlined by Fields (2005) and other neuroscience researchers (Fields et al., 2005), aimed at fostering the memory encoding by using its typical time pattern. The specific way to work of our mind was used to create a learning technique with well defined features:

- A Spaced Learning lesson consists of three 'inputs' of short duration (15'-20'), concerning the subject of the learning process and divided by 10-minutes breaks. During the two breaks students attain at simple activities, such as dribbling a basketball or playing with modeling clay, that should be unrelated to the content of the lesson. This aims at minimizing the danger of disrupting the pathways being formed to record the information in the two inputs following the breaks.
- The first input is a fast-paced presentation of information by the teacher, but there should be more student interaction and less teacher-only delivery in the second and third inputs.
- With the second input, the teacher revisits in a different manner the content of the first session. The same neural pathways will be stimulated, in order to strengthen the memory encoding.
- The final input focuses on understanding, so students should carry out a task that applies the knowledge or skills they have just acquired.
- The sessions have to be very quick, shaped and designed in details.

Dr Paul Kelley (2008), headteacher of Monkseaton High School in North Tyneside, has been the pioneer in employing and promoting Spaced Learning as didactic methodology to *give kids the space to learn*. In national examinations (see Carpenter, 2012), students studying only through Spaced Learning produced remarkable results (see Kelley and Watson, 2013). As Kandel et al. (2014) and others have pointed out, human memory involves different mechanisms that encode, consolidate, reactivate and

update explicit memory. In this context, Spaced Learning is an encoding technique. In Italy, teachers from the 'Majorana' High School in Brindisi (Apulia) have transformed the traditional methodology in Expanded Spaced Learning (Indire, 2015), adding two new phases to the original model: a depth analysis and an activity devoted to help those pupils that have difficulties in understanding the treated topics. This has converted SL in a teaching/learning methodology centered on students.

4. Results and future steps

Among the firsts results of the research – those, in particular, coming from the study of international cases – there are the pedagogical templates referred to the models Block Scheduling and Spaced Learning. They are instructional formats characterized by having a certain degree of abstraction and generalization with respect to their applicability/experimentation. The templates favour the comparison between pedagogical theory and educational practice, allowing the teachers to start a personal reflection to improve and redefine instructional actions in a customization and adaptability perspective, also considering the use of emerging technologies. Due to its characteristics, the template permits to potentially apply the models to all types and levels of school, helping teachers in the acquisition of 'routines', and allowing them to create their personal way to adapt the particular method to different kind of students. Our template is structured on three main dimensions addressed to introduce and drive transformations in educational acting in the classroom:

- 1) the pedagogical and instructional dimension, referred to the different instructional mediation strategies that can be implemented and can coexist within a model;
- 2) the instrumental dimension, referred to technologies supporting both teaching/learning processes and management and evaluation of the activities (knowledge management, handling of assessment data, etc.);
- 3) the organizational dimension, that represents the background and framework of the model, and interacts both with instructional guidelines and specific instruments and tools (electronic school register, virtual conference, smart object visual organizer – e.g., conceptual maps –, whiteboard, eBook, iPad).

With regard to the 5-step activity program foreseen by the EDOC@WORK3.0 project, the main future steps to be carried out are the teacher training program and the field testing phase. During the first part of the project, subject of training and testing activities will be the Spaced Learning model.

The teacher training program is finalized to make educators able to profitably apply and experiment SL on the field. Each training module is organized in blended mode and is composed by in presence (15 hours) and online (25 hours) activities. Courses are addressed to about 500 teachers from schools of all types and levels in Apulia region; a selected part of them is involved in field testing. Trainers are teachers expert in the implementation of the SL model in different school contexts.

The field testing, with direct observation and data collecting, aims to weigh the innovative dimension of the models through a multilevel study that regards pedagogical, technological and organizational aspects. This phase is finalized to analyze all modalities of model implementation, with special reference to the local contexts, in order to individuate general elements useful to the application of the innovative practices, and to enrich and validate the template itself. Main questions driving this inquiry are about the efficacy of the planned instructional solutions and their success among stakeholders. The research approach about evaluation considers the effects, which consist mainly in reactions and personal perceptions, motivation and sense of self-efficacy of students and teachers. Within the analysis of trials to be carried out, we will give, however, a growing analytic space to the experience of the actors involved, to their aims, desires, and to target's needs, according to a constructivist paradigm. The research will favour the adoption of a set of qualitative tools, designed to detect and analyze the modes of implementation of innovative practices in the context of traditional school practices. The survey methodology will be based on the following tools and techniques of data collection: observation of school practices, led by grids structured on pedagogical, technological and organizational dimensions; interviews with actors of the school community; an open answer questionnaire for teachers; interviews/questionnaires for pupils. The qualitative analysis of data will be performed using the software NVivo 10. The method of analysis adopted will be Grounded Theory (Charmaz, 2006), a general qualitative methodology for developing an inductive theory based on data collected and analyzed through a systematic series of procedures.

The results of this first pilot experimentation are addressed to understand the possibility to systematize innovative instructional practices and their possible variations in different contexts and levels of school, and then to promote a massive training action on the whole national territory.

References

- Baker, D. P., Fabrega, R., Galindo, C., & Mishook, J. (2014). Instructional time and national achievement: Cross-national evidence. *Prospects*, 34(3), 311-334.
- Bennett, K.J. (2000). *Block Scheduling: With a Mathematics Perspective*. University of Illinois. Retrieved May 22, 2015, from: lrs.ed.uiuc.edu/students/bennett1/block_scheduling.htm
- Carpenter, S.K. et al. (2012). Using Spacing to Enhance Diverse Forms of Learning: Review of Recent Research and Implications for Instruction. *Educ Psychol Rev* 24, 369-378.
- Cawelti, G. (1994). *High School Restructuring: A National Study*. Arlington, Virginia: Educational Research Service.
- Charmaz, K. (2006). *Constructing Grounded Theory. A Practical Guide through Qualitative Analysis*. Sage: London.
- Corno, L. Y. N. (2008). On teaching adaptively. *Educational Psychologist*, 43(3), 161-173.
- Fredrick, W. C., & Walberg, H. J. (1980). Learning as a function of time. *The Journal of Educational Research*, 73(4), 183-194.
- Fields, RD. (2005). Making memories stick. *Scientific American*, 292(2), 75-81.
- Fields, RD., Lee, PR., Cohen JE., (2005). Temporal integration of intracellular Ca²⁺ signaling networks in regulating gene expression by action potentials. *Cell Calcium*, 37(5), 433-442. Review. PubMed [citation] PMID: 15820391
- Gettinger, M. (1984). Achievement as a function of time spent in learning and time needed for learning. *American Educational Research Journal*, 21(3), 617-628.
- Indire (2015). *Avanguardia educativa. Linee guida per l'implementazione dell'idea "Spaced Learning (Apprendimento intervallato)"*. Retrieved May 20, 2015, from avanguardiieeducative.indire.it
- Kelley, P. (2008). *Making Minds: What's wrong with education-and what should we do about it?* London, New York: Routledge.
- Kelley, P., & Watson, T. (2013). Making long-term memories in minutes: a spaced learning pattern from memory research in education. *Frontiers in human neuroscience*, 7.
- Lasley, T. J., & Walker, R. (1986). Time-on-task: How teachers can use class time more effectively. *NASSP Bulletin*, 70(490), 59-64.
- Leonard, L. J. (1999). Towards Maximizing Instructional Time: The Nature and Extent of Externally-Imposed Classroom Interruptions. *Journal of School Leadership*, 9(5), 454-74.
- Leonard, L. J. (2009). Optimising by minimising: interruptions and the erosion of teaching time. *The Journal of Educational Enquiry*, 4(2).
- Lindsay, J. (2013). *The case against Block Scheduling*. Retrieved May 22, 2015, from: www.jefflindsay.com/Block.shtml
- McLeod, J., Fisher, J., & Hoover, G. (2003). *Key Elements of Classroom Management. Managing Time and Space, Student Behavior, and Instructional Strategies*. Alexandria, VA: ASCD. Retrieved May 22, 2015, from: www.ascd.org/publications/books/103008.aspx
- Mell, K. (1996). Caution Advised on Block Scheduling. *PRESS Release*, Winter/Spring. Retrieved May 22, 2015, from: my.execpc.com/~presswis/block.html
- Nuzzaci, A. (2014). La riflessività nella progettazione educativa: verso una riconcettualizzazione delle routine. *Italian Journal of Educational Research*, (2-3), 59-75.
- Patall, E. A., Cooper, H., & Allen, A. B. (2010). Extending the School Day or School Year A Systematic Review of Research (1985–2009). *Review of educational research*, 80(3), 401-436.
- Snyder, D. (1997, October). *Block Scheduling: A Case Study of Data Analysis of One High School After Two Years*. Paper presented at the Annual Meeting of the Midwest Educational Research Association, Chicago, Illinois. Retrieved May 22, 2015, from: files.eric.ed.gov/fulltext/ED414626.pdf
- Walberg, H. J., Niemiec, R. P., & Frederick, W. C. (1994). Productive curriculum time. *Peabody Journal of Education*, 69(3), 86-100.
- Wang, M. C. (1984). Time use and the provision of adaptive instruction. *Time and school learning*, 167-203.
- Williams, C. (2011, December). The Impact of Block Scheduling on Student Achievement, Attendance, and Discipline at the High School Level. Florida: Argosy University. Retrieved May 22, 2015, from: files.eric.ed.gov/fulltext/ED528899.pdf

FROM EMBODIED SIMULATION TO ENACTIVE LEARNING: EMBODIED EDUCATION THROUGH ART AND THEATRE

Nazario Zambaldi

Faculty of Education, Free University of Bolzano (Italy)

Abstract

My research tries to underline the relationship between the artistic and theatrical languages and the neuroscience, in particular starting from the discovery of the MNS Mirror Neuron System (Gallese, Rizzolatti), to offer a contribution for an enactive learning (Varela, Thomson 1991). The Embodied Simulation - a common underlying functional mechanism that mediates our capacity to share the meaning of actions, intentions, feelings, and emotions with others, thus grounding our identification with and connectedness to others (Gallese 2009) - tells us that at the basis of the understanding of the world there are the representation of the aim and the sensory-motor involvement, motor and intentional basis of learning, that art and theatre express through pre-linguistic instruments: images and actions. The powerful techniques for monitoring the mind activity through images, like the functional Magnetic Resonance Imaging (fMRI), allowed us to directly observe what happens in our brain while we are engaged in different perceptive, executive and cognitive activities. In the last years the educational sciences and the cognitive sciences have intensified their connections to the point of identifying (Fischer, Daniel, Immordino-Yang, Stern, Battro, Koizumi 2007) a unique science MBE, Mind Brain Education science (Tokuhamma-Espinoza 2010). This common field concerns the classical themes of learning, memory, attention and language, but also the themes of consciousness and body. The theoretical and empirical research, arisen at the end of the XXth Century, and now developing in cognitive sciences, is causing the change of the research interests from the mind study itself to the study of an ecological mind, of an inter independent mind between body and environment: the focus is the *concatenation* mind-body-environment, the extended mind. The perspective that moves the interest of this study is the integration of the phenomenological thinking with the cognitive neuroscience, starting from the concepts of *Leib* and *Erlebnis* (Husserl, Heidegger). In this perspective, the role of the body in the process of a developing cognition and identity is central (Lakoff 1999). The methodological approach is integrated, and the data analysis mixed; it is quantitative in the collection of life skills and qualitative in a phenomenological perspective for the exploration of individual experiences.

Keywords: *Enactive learning, neurophenomenology, embodied education, art, agency.*

1. Introduction

Since the dawn of civilisation artistic and theatrical languages have explored the world. They have experienced it in a symbolic, synthetic and aesthetic way. In this respect someone has spoken of “neuroaesthetic” (Zeky 2001). Artists know very well what neuroscience has photographed in the brain, long before new technologies were invented. Artists used to create new ways of looking at the world (at reality) using images and representations, in other words what they created was a “mimesis” of image and gesture. “The heart of the matter is not using art to study how the brain works. It is rather to study how the brain and the body work together to make us human and how that occurs. In my opinion we should talk about experimental aesthetic rather than about neuroaesthetic. The notion “aesthetic” has here its own ethimologic root: aesthesis, that is multimodal perception of the world through the body” (Gallese 2014). School, where knowledge is shared and transmitted, has for a long time preferred abstract knowledge that reproduced a society of selection and control following a linear (historical) and hierarchical (political) pattern. The aim was to alphabetize society during the first as well as in the more recent industrial phase. The heritage is an idea of culture that limits action, body and imagination in order to preserve social order. The present time and the post industrial age require dynamic and creative strategies to cope with change and sail the flow of information. The need of a productive learning and of a wide range of primary and reproductive alphabetization is replaced by productive learning in a wide range of competences - life

skills – required by complexity. Productive learning is based on energies that reside mainly in an emotional sphere, a deep rather than superficial learning. This deepness resides in the body or rather in fields of learning which use an integrated model of “mind”. According to this school is the place where these models are experimented and put into practice, a place for “real experiences” (Dewey 1934). This change into active, participative embodied models is hindered when put into practice by organizing systems. This research tries to underline the contribution of a new way of conceiving art and theatre - aesthetic – as a “work on oneself”, a reflective and expanding work, an embodied one. It also offers some instruments of self evaluation and it opens a set of a self-effective learning (Bandura 2000).

2. Design

After the introductive phase of theoretical and epistemological research, in 2015 a pilot study will be carried out, with high school as research field. The study identifies four groups (classes with the same teachers team), where an artistic and theatrical intervention will be tested (E.C.O. Electronic Cooperation Online).

2.1. E.C.O. Electronic Cooperation Online

“New digital technologies are removing language from its position of main mean of experiencing reality. They are putting a new visuality in the body rather than in language at the centre of our world perception” (Gallese 2014).

E.C.O. is an artistic and theatrical project. It considers the new forms of communication - digital, web, social network, blog, smartphones, tablet – as enhanced realities where a passive assent is transformed into relational, narrative, dialogical competences (which happens when staging and shooting). As well as dramatization there is in the E.C.O. project a reflection and a practice about new media where you can grasp both meanings of the word enactive:

- “Cognition is not the representation of a pre-given world by a pre-given mind but is rather the enactment of a world and a mind on the basis of a history of the variety of actions that a being in the world performs” (Varela, Thompson, Rosch 1991).

- “Enactive Interaction between human and world (including humans and technologies) is seen as a process participating to: the co-construction of the mind with the body and the co-construction of the humans and the world. Mediated Artificial systems, called “Enactive Interfaces”, which preserve this type of interaction, would be favourable conditions to understand such complex processes to allow humans to produce and create in a really fruitful way” (Luciani 2007).

Table 1. “E.C.O. Electronic Cooperation Online”

First step:
- setting
- team work
- introduction to the artistical language
- aspects of New media ways of communicating
Second step:
- blog dialogue
- hypertextual practice
(text, sounds, images, video...)
- narration construction and scenes creation
Third step:
- staging, 360° angle movie

In the video production provided with audio, aspects closely related to subjectiveness are focused. Dubbed voices emphasize and make aware of some dissociative aspects typical of new media. A 360° angle videocamera goes beyond frontal vision which is so typical in lectures but also in space

organization and post Renaissance and Cartesian visuality. In other words it goes beyond a TV and former digital vision, as a window looking out on the world.

2.2. Jurij Alschitz and his method

Esiaba Irobi, Nigerian dramatist and anthropologist, observed that native Americans, Asiatic, African as well as Aboriginal cultures all have at least ten forms of expression, other than language: iconographic, kinaesthetic, sonorous, calligraphic, proxemics, tailoring, linguistic, gustatory, olfactory, tactile and spiritual (Gallese 2014). There are two reasons why E.C.O. laboratories have been integrated and extended with some Jurij Alschitz exercises. On the one hand because of my personal collaboration with Jurij Alschitz in 2007 and on the other because of an internationally recognized pedagogic contribution, dealing with the “work on oneself” of the Russian school (there is more than a mere symbolic descendance: Alschitz is a student of one of Stanislavskij’s students). This theatrical pedagogy - from which all theatrical experiences up to modern time derives - puts the vitality of the scene, the relation among actors, the actor’s body in the centre. Everything that goes beyond the reductive use of the text as a mere instrument. In the middle there is the Energy where words find their reason more than in their meaning.

2.3. An experiential training

In 2016, after the first pilot phase, the real experimental study was made. It made the experiential dimensions explicit - embodied, enactive – going thus beyond labels such as art and theatre. Phenomenologic concepts such as “Leib” and “Erlebnis” are thus put into practice. This part, also known as “experiential learning” (Kolb 1984) aims at finding operative as well as evaluational instruments which can be reproduced. The mixed learning environment, blended learning, can metaphorically be considered as a “platonic cave”, of which the school room can be the “atelier”, one of the different material environments. In this environment two mirrors are placed. The first one is a virtual mirror, where interconnective, reflexive and transformative experiments about augmented web, video and smartphone reality are experimented. The second mirror reflects the theatrical work on the self, the body, the reaction, the visual contact, the breath.

On a quantitative level the survey in the other two groups (control group and experimental group) conducted through pre-test and re-test, touches the relevant aspects of the pilot study in a selective way. Those aspects are agency, self-efficacy, self-awareness with a particular focus on embodied scales as special forms of self-consciousness. If the pilot phase was more focused on defining contents and instruments, more attention is now put in qualitative aspects. In this way aspects of metacognition, autoreflection, insights, as well as moments of conscious presence/state are revealed/emerge.

3. Methods

The methodological approach is integrated, and the data analysis is mixed; it is quantitative in the collection of life skills and qualitative in a phenomenological perspective (I.P.A. Interpretative Phenomenological Analysis) for the exploration of individual experiences. Tests and questionnaires for the measurement of the life skills will be administered at the beginning (Pre-test) and at the end of the intervention (Re-test). During the experimentation, questionnaires, interviews, focus group will be carried out. The pilot study, this is the first phase of empiric research, consists of E.C.O. in group, an experimental group (SG), and parallel to this in a control group (CG). The E.C.O. laboratory aims at acquiring the knowledge of artistic and theatrical languages which include transversal competences: organization, participation, communication and relation. The experimental study is thus used for testing variation in life skills, in the levels of agency, self efficacy felt as self awareness as well as self consciousness. The pilot study focuses on those elements in art and theatre which make the perfect ground for embodied learning - syntonization between communicating people, relational background as extended mind, self reflection on the process as metacognition.

The interviews of participants and of teachers complete the study and prepare the real experimental research. E.C.O. is a project which lasted 50 hours over a period of two weeks time but in a second phase it will probably take place over a period of some months time. In this first phase of the year 2015, in the pilot study discussed here, the empiric research is focussed on instruments of quantity and on experiential tools that need to be applied. The tests about self-efficacy are taken from GSE General Self Efficacy Scale (Chen, Gully, Eden 2001), and from GSES General Self-Efficacy Scale (Sibilia, Schwarzer, Jerusalem 1995). Besides, tests are used dealing with adolescents’ positive and negative emotions, with their perception of school, the empathic self-efficacy (Caprara 2001).

Table 2. *Experimental field*

School: Liceo Artistico e Scienze umane "Pascoli", Bolzano, Italy
Groups of adolescents (16-17 years old)
Group 1 (sperimentation group, SG): 3 D
Group 2 (control group, CG): 3 E
Group 1: 17 students (14 females, 3 males)
Group 2: 18 students (14 females, 4 males)
Teacher and common subjects: Art, Philosophy, Italian
Pilot Experimentation: E.C.O.: 50 hours, 10 days. SG: 3 D.

As far as self awareness is concerned, it refers to SSAS Situational Self Awareness Scale (Govern, Marsch 2001), SCS-R Self-Consciousness Scale (Scheier, Carver 1985), Private Self Consciousness Scale (Trapnell, Campbell 1999). Some items on emotional dealing and on "locus of control", are taken from MSWS Multidimensionale Selbstwertskala (Schütz, Sellin 2006) e dalle FKK Fragebogen zu Kompetenz- und Kontrollüberzeugungen (Krampen 1991). These two scales are experimented too (ESAS Embodiment Self Assessment Scales). One is about self-assessment of embodied quantity of experience, in a traditional environment whereas the other scale refers to a mixed environment (blended learning).

Table 3. *Examples of items*

GSE: In general, I think that I can obtain outcomes that are important to me.
GSES: It is easy for me to stick to my aims and accomplish my goals.
Perceived Self efficacy in managing negative emotions: To keep calm in stress situations.
Perceived Self efficacy in managing positive emotions: Rejoice at your success.
Perceived Self efficacy Empathic Scale: To under stand what the other feels for you.
Perceived Scale of school Self efficacy: To what extent you are able to finish the homework assigned.
Life Skills Self Efficacy
Problem Solving: To what extent you are an able to find other positive solutions.
SSAS: Right now, I am conscious of my inner feelings.
SCS-R: I'm always trying to figure myself out.
PSCS: I love exploring my "inner" self.
MSWS: Have you got any doubts about yourself?
FKK: Whether I have an accident or not is mainly due to good luck.
ESAS: Do I feel comfortable if I look into someone in the eyes?

4. Conclusions, expected outcomes

The expected results in this phase are underlining the embodiment effects of art and theatre through visual and kinesthetic channel, but mainly the rising of a particular self-reflexive ability. We define what is effective in the artistic and theatrical languages and what can be applied to an embodied didactic: 1) to defining the life skills, asked by the complexity of the contemporary post-industrial society starting from art and theatre 2) to identifying in the embodiment, as a didactic practice, the access key to modify the perspective and for introducing a new paradigm of learning 3) to measuring the effects of this paradigm change, that makes significant, "living", the knowledge. The first phase of the pilot study should measure variations in life skills such as how emotions are managed, self-efficacy, self-awareness. Those variations are the consequences of the artistic and the theatrical "training" called E.C.O., which gives new instruments for self-evaluation about embodied experiences. This phase establishes the foundations for the empiric study, which measures the efficacy of an experimental training based on art and theatrical techniques. The techniques become a multimodal interface to build an environment for enactive learning.

References

- Alschitz, J. (2003). *Training forever*. Malmö: Lund University.
- Bandura, A.. (2000). *Autoefficacia: teoria e applicazioni*. Trento: Erickson.
- Bateson, G. (1977). *Verso un'ecologia della mente*. Milano: Adelphi.
- Caggiano, V., & Fogassi L., Rizzolatti G., Thier P., Casile A. (2009). Mirror neurons differentially encode the peripersonal and extrapersonal space of monkeys. *Science*, 324, 403-406.
- Caligiore, D., & Borghi A.M., Parisi D., Baldassarre G. (2010). TRoPICALS: A Computational Embodied Neuroscience Model of Experiments on Compatibility Effects. *Psychological Review*, 117, 1188-1228.
- Caprara, G.V. (2001). *La valutazione dell'auto-efficacia. Costrutti e strumenti*. Trento: Erickson
- Chen, G., & Gully S.M., Eden D. (2001). Validation of a New General Self- Efficacy Scale. *Organizational Research Methods*, 4, 62-83.
- Dewey, J. (1934). *Art as Experience*. New York: Putnam.
- Fischer, K. W., & Daniel D., Immordino-Yang MH, Stern E., Battro A., Koizumi H. (2007). Why Mind, Brain, and Education? Why Now? *Mind, Brain, and Education* 1(1), 1-2.
- Gallagher, S., & Zahavi D. (2008). *The phenomenological mind: An introduction to the philosophy of mind and cognitive science*. London: Routledge.
- Gallese, V. (2014). Arte, Corpo, Cervello. Per un'Eстетica Sperimentale. *Micromega*, 2, 49-67.
- Gallese, & V., Rochat M., Cossu G., Sinigaglia C. (2009). Motor Cognition and its role in the phylogeny and ontogeny of intentional understanding. *Developmental Psychology*, 45, 103-113.
- Govern, J. M., & Marsch L. A. (2001). Development and validation of situational self-awareness scale. *Consciousness and Cognition*, 10 (3), 366-378.
- Luciani, A., & Cadoz C. (2007). *Enaction Enactive Interfaces. A Handbook of terms*. Grenoble: ACROE.
- Kolb, D. A. (1984). *Experiential Learning. Experience as the source of Learning and Development*. Englewood Cliffs NJ: Prentice Hall.
- Krampen, G. (1991). *Fragebögen zu Kompetenz-und Kontrollüberzeugungen (FKK)*. Gottingen: Hogrefe.
- Lakoff, G., & Johnson M. (1999). *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought*. New York: Basic Books.
- Nöe, A. (2004). *Action in perception*. Cambridge MA: MIT Press.
- Scheier, M. F., & Carver C. S. (1985). The Self-Consciousness Scale: A revised version for use with general populations. *Journal of Applied Social Psychology*, 15, 687-699.
- Schütz, A., & Sellin I. (2006). *Die multidimensionale Selbstwertkala (MSWS)*. Göttingen: Hogrefe.
- Tokuhamma-Espinosa, T. (2010). *Mind, brain, and education science: A comprehensive guide to the new brain-based teaching*. New York: Norton.
- Sibilia, L., & Schwarzer R., Jerusalem M. (1995). Italian Adaptation of the General Self-Efficacy Scale: Self-Efficacy Generalizzata. Retrieved from: <http://userpage.fu-berlin.de/~health/italian.htm>.
- Trapnell, P. D., & Campbell J. D. (1999). Private self-consciousness and the five-factor model of personality: Distinguishing rumination from reflection. *Journal of Personality and Social Psychology*, 76(2), 284-304.
- Varela, F., & Thompson F. (1991). *The Embodied Mind. Cognitive Science and Human Experience*. Cambridge MA: MIT Press.
- Varela, F. (1996). Neurophenomenology. A methodological remedy for the hard problem naturalizing phenomenology and cognitive science. *Journal of consciousness studies*, 3, 33-49.
- Zeki, S. (2001). Localization and globalization of conscious vision. *Annual Reviews of Neuroscience*, 24, 54-86.

WHAT IS A MULTISENSORY TENT? DEVELOPING A MULTISENSORY METHOD AND NEW LEARNING ENVIRONMENTS

Sari Kivilehto¹, Anne Malin¹ & Minttu Rätty²

¹Department of Teacher Education, University of Helsinki (Finland)

²R&D&I Department, Laurea University of Applied Sciences (Finland)

Abstract

The aim of this research project is to develop a multisensory method and new learning environments. The central element of the project is an easily adaptable multisensory tent which is a space that gives experiences to different senses. The interior of the tent could contain sounds, smells, tastes and different items that lead users of the space to experience different atmospheres and feelings. Building a tent generates a material artifact but the process of planning and building a tent is also important. The building process encourages students to communicate and interact with one another and activates their learning. Researching the multisensory method has been a developmental process in which new approaches to and uses for the multisensory method have been created. This study describes three pilot studies which were carried out during 2013 and 2014. Data has been collected by interviewing the students and partners who took part in these pilot studies.

In Kivilehto's pilot study the aim was to enhance creative problem solving of students by building multisensory tents. Multisensory tent was a learning environment where students were able to practice new ways of creative and critical thinking by using a tent as a tool for learning. The results pointed out that building of the tents forced the students to innovative thinking processes and common knowledge building. In Malin's pilot study the aim was to create a physical learning environment by building a multisensory tent to an open learning environment in a museum. Students interacted with each other, with the visitors of the museum and with the physical environment. The results showed that acting in an open learning environment and meeting the visitors opened up new learning experiences and processes. In Rätty's pilot study the aim was to create multisensory tents as a means of multicultural education that works as a promoter of interaction of different groups and as a tool for identity negotiations. Multisensory method enables students, immigrants and different partners of working life create a process that enhances the interaction between different cultures. The results showed that understanding between the cultures increased during the common processes.

Keywords: *Multisensory method, multisensory tent, open learning environment, creative problem solving, identity negotiation*

1. The background of the study

The concept of the Multisensory Space has been further developed in Finland, at Laurea University of Applied Sciences since 2007. During 2009-2010 the method was advanced in a project called *Encounters in multisensory space* and in 2011-2014, in another project entitled *With All Senses – Developing Open Learning Environments (Aistien – Avoimia oppimisympäristöjä kehittämässä)*. This continued the development and promotion of the method. (Rätty, 2011; 2014.)

The use of multisensory teaching has been studied previously to some extent. Multi-sensory impulses have been shown to promote learning. Two sensory channels coming through the stimuli have been used, for example in mathematics and language learning. (Shams & Seitz, 2008; Jubran, 2012.) On the other hand, sounds and smells can trigger a learner to connect events and information which have been previously learned. (Lehtinen, Haapala & Dahlström, 1993.) In our study we approach the use of different senses more from the point of view of how they can create an inspiring and phenomenal learning environment. A comfortable and activating learning environment awakens a student's enthusiasm for learning. (Jensen, 1998; Stoffers, 2011.)

In this study the multisensory method leans on the theory of socio-constructivism (Vygotsky, 1978; 1987.) that emphasizes the impact of collaboration and negotiation on thinking and learning.

Interaction with the social and physical context is also important. We examine the multisensory method through the lenses of the models of investigative learning (Hakkarainen, Lonka & Lipponen, 2001), collaborative knowledge building (Bereiter, 2002) and the experimental learning environment. (Stoffers, 2011.) The aim is to develop a multisensory method in the building processes of multisensory tents and to focus on cognitive (Kivilehto), physical (Malin) and multicultural (Räty) perspectives of learning.

2. Three pilot studies

During 2013 we began co-operating with the University of Helsinki and the Laurea University of Applied Sciences to further the pedagogical development of the multisensory method. The students of Home Economics education in the Department of Teacher education in University of Helsinki became acquainted with the multisensory method as part of their studies. The aim of the project was to plan and build multisensory tents to open learning environments in two museums. The pilot studies in the University of Helsinki were carried out in two different study modules.

2.1. Collaboration with the Museum of Technology

The Museum of Technology is a specialized national museum, whose mission is to store, study and present information on the development of the technical field and industrial production in Finland and their impact on society and living conditions. It is the only general museum of technology in Finland. The Museum of Technology highlights basic technological phenomena, technical inventions and industrial processes, and tells a story about Finland and the Finns.

In Kivilehto's pilot study the students (first year students) collaborated with the Museum of Technology. The students of home technology put the history of laundering into practice. They built multisensory tents which contained representations of washing clothes, laundry detergents and the post-processing of laundry. When the students started the project four different working groups were established. One was a technical group that took care of pictures, sounds, effects and lights, for example. The second group was a knowledge group that searched for written material and relevant literature. The third group was a material group that gathered relevant supplies, equipment and appliances. The fourth group was a teaching and guiding group that planned learning material and a guided tour for pupils visiting the museum.

In Kivilehto's pilot study the aim was to enhance the students' cognitive and creative problem solving skills. The Multisensory tent was a learning environment where students were able to practice new ways of creative and critical thinking by using a tent as a tool for learning. The intention was to find out whether the building of the tents led students to innovative thinking processes and common knowledge building. (Kivilehto, 2011.)

2.2. Collaboration with the Hotel and Restaurant museum

The Hotel and Restaurant Museum is specialized in the history of hotels, restaurants, cafés, tourism and Finnish culinary culture. The permanent exhibition covers the history of catering and also the history of alcoholic beverages and the sale of alcohol in Finland.

In Malin's pilot study 3rd and 4th year students collaborated with the Hotel and Restaurant museum. The students planned and built two tents dedicated to the topics of *Everyday Home* and *Children's Party*; spaces that were part of the changing exhibition under the theme *Taste of 80s*. The exhibition introduced Finnish culinary culture in the 1980s. Besides planning and building multisensory tents, students also organized workshops with the museum personnel and gathered the experiences of visitors in written form.

The aim of Malin's pilot study was to create a new type of physical learning environment by building a multisensory tent as an open learning environment in a museum. Students worked in close co-operation with museum personnel and with visitors to the museum. In this study knowledge was gathered of how students used the multisensory tent and how it functioned in an open learning environment. The intention was to find out whether building the tents and meeting visitors opened the students up to new learning experiences and processes. (Malin, 2011.)

2.3. Multicultural studies in Laurea University of Applied Sciences

In Laurea's learning concept, the Learning by Developing (LbD) model, learning takes place in working place-oriented projects in which students, lecturers, working place experts and customers work together to develop innovative solutions. Working together leads to competence that allows students to manage diverse situations in the constantly changing world of work. (Tautila & Raji, 2011.)

The aim of Räty's pilot study was to create multisensory tents as a means of multicultural education that works as a promoter of interaction between different groups and as a tool for identity

negotiations. The multisensory method enables students, immigrants and different partners of working life to create a process that enhances interaction between different cultures. (Jenkins, 2008.) The intention of this study was to find out how the process of building a multisensory tent enhances social interaction and understanding of different cultures and promotes co-operation between students and other actors.

3. The implementation of the study

During the spring of 2014, all the students that took part in the pilot studies were interviewed in a group interview. There were eleven 3rd and 4th year students and 36 1st year students from the University of Helsinki. There were also 25 students from Laurea University of Applied Sciences. Data was also gathered from the blogs and reports that students have produced during their studies in social methods. From the blogs one is able to follow the development of phenomena based learning.

All of the interviews were tape recorded and transcribed. For closer examination, content analysis was used to analyze the data. From the data gathered one seeks the answer for the question: *what kind of collaborative process is the building of a multisensory environment?*

4. Results

The students of the University of Helsinki that worked with the museums built the movable version of the multisensory space in the middle of an exhibition or in the lobby of the museum. The space was simple; a simplified version of reality. There were different sense-stimulating elements: an image or images were projected on the wall as a landscape, and there were some artifacts to touch and feel in the tents. There was also something to smell and taste.

At the beginning of the project it was challenging for the students to find objects which were from the right historical period, and which would also inspire visitors joining the discussion and exploration of objects, and the theme in general. Many students mentioned that it was challenging to keep the environment simple and at the same time give visitors enough information.

To build the multisensory spaces successfully students had to make careful background inquiries and theoretical studies. Because of the time limit students had to share duties, but there was also the need for continuous discussion and coordination between the groups. The groups which could define together the common goal and the mission of the space as exactly as possible before the practical building of the multisensory space got the best result. In Kivilehto's study the results also pointed out that building of the tents forced the students to innovative thinking processes and common knowledge building.

Many students noted that the most important learning experience was learning about the group work. They understood the need to prepare processes and timetables and clarify the roles of group members. Many commented that learning how to solve problems in a group and being aware of one's own behaviour in the group were valuable experiences. Students realized that they had different individual ambitions and objectives regarding the project, and their studies in general, and that meant that they had to discuss the role of each student in the group. The results of Rätty's study showed also that understanding between the cultures increased during the common processes.

Many students also mentioned that the most meaningful experience was learning about project work and about organizing an event. They appreciated the possibility to cooperate with the museums and saw it as very valuable experience for the future. The results of Malin's study showed that acting in an open learning environment and meeting the visitors opened up new learning experiences and processes.

Most of the students gave positive feedback about the design of the course; namely that they had to integrate the theoretical studies with practical action. The practical action gave them ideas about their futures work as teacher, how to plan active and participatory teaching methods.

References

- Bereiter, C. (2002). *Education and Mind in the Knowledge Age*. New Jersey: Lawrence Erlbaum Associates.
- Dillenbourg, P. (1999). *Introduction: What do you mean by "collaborative learning"?* In P. Dillenbourg (Ed.), *Collaborative Learning: Cognitive and computational approaches* (pp. 1-19) Amsterdam: Pergamon, Elsevier Science.
- Hakkarainen, K., Lonka, K. & Lipponen, L. (2001). *Tutkiva oppiminen. Älykkään toiminnan rajat ja niiden ylittäminen*. Porvoo: WSOY.
- Jenkins, Richard. (2008). *Social Identity*. London & New York: Routledge.

- Jensen, E. (1998). *Teaching with the brain in mind*. Alexandria: VA: Association for Supervision and Curriculum Development.
- Jubran, S. (2012). *Using multisensory approach for Teaching English Skills and its Effect on Students' Achievement at Jordanian Schools*. Retrieved 21.11.2014 from: <http://eujournal.org/index.php/esj/article/viewFile/419/567>
- Kivilehto, S. (2011). *"I will soon understand". The House Planning Program as an Enhancer of Pupils' Thinking Skills and Learning in Home Economics at Comprehensive School*. University of Helsinki. Department of Teacher Education. Academic dissertation. Home Economics and Craft Studies Research Reports 27. Helsinki: Unigrafia.
- Lehtinen, U., Haapala, M. & Dahlström, R-M. (1993). *Aistien avulla oppimaan*. Lähestymistapoja vaikeasti monivammaisten henkilöiden kehityksen tukemiseen. Helsinki: Kirjayhtymä Oy.
- Malin, A. (2011). *Home Economics Classrooms as Part of Developing the Environments – Housing Activities an Curriculum defining Change*. University of Helsinki. Department of Teacher Education. Academic dissertation. Home Economics and Craft Studies Research Reports 26. Helsinki: Unigrafia.
- Räty, M. (2011). *"The Multisensory Space" – a new method for Multicultural Education and Support of Cultural Identity*. Article ICERI2011. Proceedings CD in Shams, L. & Seitz, A.R. (2008) Benefits of multisensory learning. Trends in Cognitive Sciences 721.
- Räty, M. (2014). *"The Multisensory Space" – a new learning environment*. Article ICERI2014. Proceedings CD.
- Shams, L. & Seitz, A.R. (2008). *Benefits of multisensory learning*. Trends in Cognitive Sciences 721.
- Stoffers, M.A. (2011). *Using a multi-sensory teaching approach to impact learning and community in a second grade classroom*. Master of Science Thesis in Teaching. Rowan University. New Jersey. USA.
- Taatala, V. & Raij, K. (2011). *Philosophical Review of Pragmatism as a Basis for Learning by Developing Pedagogy*. Educational Philosophy and Theory.
- Vygotsky, L. S. (1978). *Mind in Society*. The Development of Higher Psychological Processes. Cambridge: Harvard University Press.
- Vygotsky, L. S. (1987). *Thought and language*. Edited by A. Kozulin. Cambridge, MA: MIT Press.

SIMULATION AS A MODEL OF POLITICAL PARTICIPATION TEACHING

Kinga Anna Gajda & Aneta Pazik

*The Institute of European Studies, Faculty of International and Political Studies, Jagiellonian University
(Poland)*

Abstract

The issue of youth participation and engagement in operation of democratic structure and institution become more and more visible. The interest in building of civic dialog and active participation in public life is increasing but still there is lack of model of teaching of participating and engagement. The paper focuses on project of political participation's teaching of youth. During project there are used active models of teaching and created a new teaching tools. The most important model are simulation games – during project pupils of secondary school create a society and political area. They was divided into politicians, society, election campaign and journalist (press and tv). They play games where they simulate election situations and they are able to decide what kind of election is the best for their e-election of real-election. The aim of the paper is to present the idea, course and results of using simulation game during teaching process.

Keywords: *Simulation, active method teaching, youth participation*

1. Introduction

Youth shows a relatively small interest in participating in the political or social communities within which they operate. A reflection of this is a low turnout in the elections. In 2009, elections to the European Parliament were attended by 29% of young people, which was less than five years earlier, when the voter turnout was at 33% of Europeans aged between 18 and 24 (Post-electoral survey 2009, p. 16).

Flash Eurobarometer 375 provides an insight into reasons for their absenteeism. The majority of young Europeans taking part in the research (64%) said that this is due to the fact that "they do not believe that their voice changed anything." Furthermore, 56% of young people said they did not vote, as the European Parliament does not sufficiently deal with problems that relate to the respondents, and 54% is not interested in European politics or elections. As it turns out, this is not an attitude that applies to the EU, since 47% are not interested in either politics or elections in general, and 37% had never voted (Flash Eurobarometer 375, p. 35).

Flash Eurobarometer 375 shows also that youth is reluctant to engage in social activities. Forty four percent of youth (EU -27) in 2013 did not take any active role in youth organizations. Most (35%) were members of sports clubs, rather than youth clubs (22%). Adolescents definitely showed less interest in the case of participation in organizations of a strictly civil or political nature. The activities of organizations aimed at improving the situation of the local community (a local organization aimed at improving local community) involved only 15% of youth. The lowest interest was participation in the organization or political party (5%). It should be noted that in each of these areas, there are large and very large disparities between various EU countries. The biggest lack of involvement in any activity is highest in countries that joined the EU after 2004. These percentages constitute over 50% in the following countries: Bulgaria (59%), Czech Republic (49%), Estonia (57%), Cyprus (67%), Latvia (53%), Lithuania (63%), Hungary (63%), Poland (60%), Romania (60%), Croatia (59%) (Flash Eurobarometer 375, p. 8).

2. Objectives

The paper presents the outcomes of a research project that was conducted on Polish high-school pupils. The main aim of our research was to develop a teaching method that could contribute to enhancement of European youth's participation in elections. We define participation in terms of political activity confined both to voting process as a basic means of influencing political leaders' decisions, and the engagement in local matters. Participation should be based on a individual, reflective decision-making

process. Thus it must be combined with a ground knowledge on subjects under consideration, which embraces not only the particular questions brought up by parties in their political programs, but also the basic knowledge on mechanisms of functioning of political environment and the institutions, which candidates are being elected for. Therefore the second aim of our project was to provide the participants with a series of workshops on European and national parliaments, political parties and means of voting. Thirdly, our goal was to discover a means of voting that may be perceived by youth as an incentive to take part in elections.

3. Methodology

Simulation is a method of active learning, which is based on the imitation of reality in order to gain experience similar to the real one. Richard Duke writes that this "educational technique - the view that a game is a classroom technique, the modern equivalent of colored paper and paste". He also underlines that simulation is "correlation with societal process - an emphasis on role-playing and on the duplication of social interaction" (Duke 1974, p. xiii). In this way, the author of *Gaming - the Future's Learning* highlights the link with simulation of life science in society. This demonstration, which can be described as a miniature picture of reality, or rather a model of social, political or economic processes. Like the gaming simulation it consists of three components: the game having certain rules of conduct; a role which participants undertake, and simulation. The purpose of the simulation is to show the process from beginning to end. But what differentiates simulation from a simulation game is that its sole purpose is to enhance the students' ability to interact, negotiate and reach a compromise. Simulation is, first and foremost science communication. Duke notes that "the simulation is defined as a (...) communication mode and Future's Language which combines a game-specific language and Communications Technologies Appropriate multilogue interaction with the pattern" (Duke 1974, p. 55). It is therefore an interactive, holistic model of communication.

The simulation starts with the students acquainted with the problem and discussing the issue on the basis of existing theories. Then the student has a chance to analyze, verify and apply these theories, as are necessary to carry out the game. Based on the skills acquired and self-seeking student adds new messages at the same time educating new skills. It is important at the outset to determine the pedagogical goals of the game and rules of the game - such as duration, schedule, tasks undertaken by the students. Then it is necessary to introduce the students to complete the simulation scenario and determine their specific roles, clearly explaining the role and function of their respective job. The most important part of the game, however, is not its initial phase (setting the rules and roles), or phase of the game, but the final phase. After the game is finished and the students are no longer role playing, they need to discuss the overall experience, as well as its effects. Only in this phase is the teacher activated. The teacher throughout the actual simulation phase only controls the course of the game - ensures friendly atmosphere, corrects and directs the course of the game, enforces the order of processes and tasks in the game. He or she is primarily an observer. In the final phase the teachers takes over the role of a moderator.

Paolo Rizzi and Joanna M. Woźniakiewicz in their article 'Perspectives of simulation games in education - theory and practice' suggest that the final phase, which is a summary, should be called debriefing. They write: "In the absence of a good equivalent in Polish, we remain at borrowing from English. Debriefing, as in the military, is the time after the action, while analyzing its course, the behavior of the participants, draws conclusions from the events and is considering other ways to solve the problem." (Rizzi, Woźniakiewicz) Ron Stadslev suggests in the final phase of an experimental model simulations used DIAG, consisting of four components: experience, identification, analysis and generalization. In the experiment phase, the students discuss the reasons why simulation is received, and how this experience is a simulation of real life experience that allows them to solve their daily problems. At this stage, they identify and discuss the symbolic meaning of simulation, reveal their feelings and reactions. They answers questions like: When did you feel well or when bad, during the simulation? What was your most important experience? In the Analyze phase, the relationship between causes with effects, is also discussed as well as alternative decisions and effective strategies. Students also answer questions such as: What kind of problems you had to face? To what extent did you engage in solving problems? At the final stage: generalization is made with the students reflecting on the life skills that students take away from the simulation. This includes describing different roles, events, interactions, simulation results and comparing them with those which, according to the participants could potentially occur in a real life. (R. Stadslev by: M. E. Gilliom 1977, p. 112-113). It is important that this analysis was the students' independent process of self-evaluation.

Learning through simulation takes place in the process of "learning by doing" and learning from the mistakes made in a safe-simulation setting. Since the turn of the sixties and seventies, theorists - such

as Omar Khayyam Moore and Alan Ross Anderson (Moore, Anderson 1969, p. 585) point out the pros of applying simulation as a method. They note that the simulation is based on providing "environment for learning" And is this environment, from one hand more productive if it permits and facilitates the taking of more perspectives toward the issue than another environment ". In addition, "This implies the ability of the learner or make it deduce probable inference within the context of the educational environment. This requires an environment which is logically and coherently structures, permitting the learner to make leaps of faith that some other perspective or level of thought ". Simulation method teaches productive thinking and allows you to break the conventional thinking. An important element is learning to solve problems. It is not just the acquisition of knowledge, but also the ability to learn new skills and learning attitudes, develop observation, imagination and memory, and teaches concentration. Furthermore, the simulation stimulates motivation of the participants. Learning is more effective and longer lasting knowledge. Simulation combines theory with practice, favoring the latter. Simulation as a teaching method is increasingly used in education. It is mostly applied in the teaching of early education, but can also be successfully applied at higher levels of education.

4. Design

The method of simulation was implemented in work with pupils while conducting the academic class of intercultural competence. The main goal was for pupils to develop their competences to work and communicate in an international team. It was important to broaden their knowledge about the culture of Europe, widen their horizons of perception and let them know about the differences in European ways of thinking, expression of feelings and communicating while working on a common project. Moreover, the pupils were encouraged to follow the current events in press and use various sources of information, which aimed at raising their awareness of common European culture and to promote their own region in its framework. Other important goals included development of the attitudes of tolerance and respect towards other cultures and values, skills such as: creativity, responsibility for the team and completion of the task, the ability to judge, formulate conclusions and detect good practices and patterns. The aim of the project was also to adjust the high school curricula to European standards and expectations of the globalizing world. The project was developed by combining lectures and workshops conducted by scholars and PhD students from the Institute for European Studies at the Jagiellonian University. The main focus was on the manner of teaching, which was not only to provide profound knowledge but also to work case studies as exemplary problems, to learn creative thinking and to combine theory with practice. The pupils had an opportunity to search for the similarities and differences between the cultures of different countries in the European Union, and to seek or form an intercultural dialogue. They had to learn how to work in groups, confront their knowledge with the reality, analyze by comparison, discuss both with peers and adults and have respect for their own heritage.

The experimental research was conducted in three stages: preparation, implementation, conclusion. We invited seventy pupils aged 15-19 to take part in our research. The preparatory phase of the project was opened with an analyze of a questionnaire that had been distributed among prospect participants. In the questionnaire the pupils were asked if they had participated in previous elections (or they were willing to do so in the future in case they were not eligible for it at the given time), how they defined political elections and the factors that would encourage them to take part in voting. The questionnaire provided an input into design of the final project's scheme, as we noticed there were two major problems that had to be taken into consideration. Firstly, despite the fact that most pupils identified voting simply as a "democratic process in which citizens choose their representatives", in some of the answers the elections were defined in a wrong or even pejorative way. Secondly, the majority of pupils deemed that introduction of e-voting would be an incentive for them to give their votes. Thus it was decided that workshops on democratic decision-making process should be conducted and that our simulation should be focused on e-voting as a potential instrument of enhancing youth's participation in elections. The next part of an opening phase was a series of classes on subject-matter.

A key part of the project assumed that participants should be divided into following groups: a) three political parties, b) a group of media representatives, c) a voting commission. The main task of the pupils gathered in political parties was to make up a name of the party, prepare its political program and to promote it through different communication channels in a framework of a political campaign. Leaders of the parties had to take part in a debate. The second group was responsible for delivering the information on the parties and transmitting the campaign subjecting it to public opinion (other pupils in the school involved in the project who constituted a group of voters). Voting commission's task was to issue regulations related to the voting process.

The last part of the project included the voting. The pupils were offered two possibilities of voting: in a so-called traditional way (by casting a vote at a polling station running in the school) or via an

online tool. After the elections finished, the discussion in a group was organized and in-depth interviews with participants were carried out.

5. Project implementation

During a preparatory phase participants attended to a seminar which was designed to familiarize them with the objectives of the projects, as well as knowledge of the European Parliament and the national parliament, the issue of political choices, participation, party and its programs. The second part of workshop was devoted to preparing the analysis of Polish political party programs based on their ideological convictions. First participants were presented with the basic assumptions of mainstream ideology (conservatism, liberalism and social democracy) and then they worked in groups on a text of electoral party programs. Their task was to identify the ideological assumptions, and to which party they themselves belonged to. Youth were also asked to allocate roles among themselves that would be played as part of the simulation. Preparatory phase was pursued the following month. Then classes were divided into two parts. Throughout the first portion of the class, the entire group worked together with an activist from one of Polish youth associations. The program included theoretical considerations such as: the dimensions and levels of participation, its forms and types (with emphasis on the role of the third sector), as well as practical issues related to public participation opportunities of young people at local, national and European level. Throughout the entire class, a public consultation on the Structured Dialogue Programme (coordinated by the European Commission) was carried out, addressing the ways to increase the participation of young people in political life. In the second portion of the class, the students were divided into groups representing political parties, the media and the electoral commission. The aim of the first workshop was to familiarize the students with organizational aspects of functioning of political parties, their strategies and political programmes. Workshop for electoral commission was designed to familiarize the participants with the specifics of the work and the role of electoral commissions during different types of elections. Particular emphasis is placed on the voting procedure and alternative voting, including e-voting. After the presentation of the course through the use of multimedia, the workshop participants - within the framework of a case study - portrayed themselves as fictional citizens of a democratic state called "Far away after seven-mountains", creating rules of the electoral committee which would meet the expectations of modern society. Furthermore they prepared a draft outlining the rules of debate and the subsequent election, which would take place in the framework of the project. The latter group (media) was familiarize the students with the media and the many types of media, their functions, and the mediatization of politics. Students split up into teams representing: newspapers, television, radio and social media; they discussed the differences and similarities between the media and prepared a plan of action.

One month later a debate between the leaders of the parties was held. It revolved around school matters. The debate was opened by electoral commission which introduced the regulations of a debate. Then, journalists presented the media materials produced by them and which included newspaper articles, reportages, radio broadcasting and television advertisements. After that, party leaders were invited to present their programs. Not only did the participants have to identify the problems existing in their school, but also to present the best solutions to sort them out. When they had finished, the leaders were confronted both with journalists and the representatives of voters.

The last phase of the project consisted in organization of elections. A poll station was running at school, where pupils could cast their votes to the ballot. The students had an alternative means of voting which was an online tool which was secured so that only one vote per person could be given. Majority of students took part in the elections. The turnout was high and amounted to seventy-two pupils. The simulation shows that participants decided to choose e-voting.

After the simulation had been finished, in-depth interviews were conducted. Their aim was two-fold. On the one hand it was designed to assess the used teaching method. The discussion and interviews showed that pupils evaluated this method positively as it incorporated different ways of interactive teaching. They underlined that taking part in a simulation gave them a deeper insight into political mechanisms and functioning of political parties and parliaments. It also helped them to get familiarized with alternative ways of voting.

On the other hand the results of the questionnaire and the interviews revealed that this method can contribute to the increase of civic awareness among high school pupils, rising their interest in local matters, fostering a sense of responsibility for their own milieu and adoption of agent roles in local environments. The interviews showed that after the simulation pupils were more willing to undertake unpaid initiatives and to get involved in school projects. They also became familiarized with problems in schools and with the activities of existing students organizations. They also declared to take more frequent part in elections, as soon as they reached the necessary age limit.

6. Conclusions

The paper presents the outcomes of the research that was conducted on Polish high-school pupils. During the evaluation a survey on the topic of simulation and e-voting was conducted, as well as interviews relating to the method used in the project. Students agreed that thanks to the opportunity to work independently, as well as the role-playing that was involved in the project, they were happy to look for materials, and they also understood that they can participate in democracy and cocreate their reality. The end result of the project is a bilingual publication and a handbook on participation prepared in cooperation with the students.

References

- Bredemeier M.E., Rotter N.G., Stadslev R. (1981), "The Academic Game" as a Frame Game, *Journal of Experiential Learning and Simulation* vol. 3, pp.73-83.
- Duke R. (1974), *Gaming – the Future's Language*, New York: Sage Publications
- Flash Eurobarometer 375. European Youth: participation in Democratic Life, ec.europa.eu/youth/library/reports/flash375_en.pdf [retrieved: 19/04/2014]
- García-Carbonell A., Andreu-Andrés M. A., Watts F. (2014), Simulation and Gaming as the future's language of language learning and acquisition of professional competences. : Back to the Future of Gaming. Germany: WB Verlag, p. 214-227.
- Gilliom M.E. (1974), Trends in Simulation, *The High School Journal*, vol. 58, pp. 265-272.
- Moore O.K., Anderson A.R. (1969), Some principles for the design of clarifying educational environments. In: *Handbook of Socialization Theory and Research*, ed. David Goslin, Chicago: Rand-Mc Nally
- Post-electoral survey 2009. Report, Fieldwork: June-July 2009, www.europarl.europa.eu/.../EB71.3_post-electoral_final_report_EN.pdf, p. 65 [retrieved: 20/05/2014]
- Rizzi R., Woźniakiewicz J.M., *Perspektywy zastosowania gier symulacyjnych w edukacji – teoria i praktyka*, <http://www.hc.amu.edu.pl/numery/5/rizziwozniakiewicz.pdf> [retrieved: 15/12/2014]

RISK MANAGEMENT AND THE IDENTIFICATION OF NURSING STUDENTS AT RISK

Dr. Naomi Malouf¹ & Ms. Rena Frohman²

¹ *Queensland University of Technology, Lecturer (Brisbane, Australia)*

² ¹ *Queensland University of Technology, Language and Learning Educator (Brisbane, Australia)*

Abstract

In Australia, Work Integrated Learning (WIL) experiences are central to the curricula of practice disciplines such as health and education as a way of allowing students to apply theoretical knowledge of their discipline to the practical environment. Undergraduate nursing in real world contexts provide authentic learning experiences which increases readiness for graduate practice, but imposes an inherent risk if students are not performing at expected standard or are not assessed effectively against the professionally mandated criteria. University coordinators need to identify and manage at-risk students early to avoid the negative consequences for student learning and patient safety. This is particularly relevant to managing large cohorts where the risk of “slipping through the cracks” becomes greater. To mitigate the inherent risk of placing students in Nursing WIL placements, early identification of at-risk students can decrease the risk of failure and better support and manage students’ learning needs. The purpose of this paper is to describe the development of an at risk identification strategy using a cohort of third year, undergraduate nursing students completing the WIL component of their degrees in Brisbane, Australia. The pilot strategy encompasses all of the expected student and facilitator competencies

Keywords: *Work Integrated Learning, at risk, Nursing, nursing student, risk management*

1. Introduction

The aim of many contemporary Australian universities providing health education programmes is to develop highly informed and skilled graduates whose capacities extend beyond formal learning, to the generation and application of discipline specific knowledge in their prospective fields. Work Integrated Learning (WIL) is central to the curricula of practice disciplines and is documented as providing an effective methodology which engages and promotes students’ learning. Advancing students’ learning of “real world” healthcare contexts, while integral to educational development of nurse graduates, is not without risk to universities and the wider communities. This paper describes an “at risk identification” strategy that looks to mitigate the inherent risk of placing students in Nursing WIL environments, while providing optimal learning opportunities for these burgeoning practitioners.

2. Work integrated learning in Australian nursing education

The increasing attention on WIL is in part due to the industry skills shortages and subsequent pressure on universities to produce “work-ready” graduates. It is commonly accepted that experiential learning ^[1] provides students with genuine learning opportunities where they can, given the optimal conditions, learn from their mistakes in a safe, supported environment and gain better insights into the knowledge of the discipline through inductive, reflective reasoning. WIL experiences are reported to benefit students by providing authentic learning contexts in which they can: integrate theoretical knowledge and practical application ^[2, 3], engage in embedded cultural understanding of their discipline ^[4] and demonstrate their working understanding in meaningful contexts ^[5, 6].

Australian pre-registration nursing courses include a minimum of 800 hours of compulsory clinical experience ^[7]. As part of the students’ “journey to becoming” ^[8] an RN in the clinical environment and as part of their WIL experience, students are allocated a guide – generally known as a “clinical facilitator” – to support and assess them during their time in the hospital environment. In this model, one RN is allocated up to eight students to “facilitate” their learning experiences ^[9]. Both facilitators and students are supernumerary to rostered staff members, not assuming a workload or direct

responsibility for care provided to patients. Facilitation models scatter students across 3-4 wards within the hospital, with the facilitator roving between the various clinical areas and working alongside ward RNs to model behaviour and core competency values in the clinical environment. The facilitator is occasionally seconded by the hospital, but more likely, facilitators are casually employed university staff members; expert clinicians in their respective clinical specialty but who may or may not be familiar with the specific hospital in which they are working.

The key characteristics of effective WIL supervisors include their experience in the discipline, their values and commitment to the learning process and their capabilities to foster supportive, student-centred learning environments. Facilitators need the ability to foster critical thinking and self-directed learning^[10]. Thus, effective WIL experiences rely, in part, on two key variables: engaged, well-prepared, reflective students and competent student-centred supervisors. If there are gaps or weaknesses within this relationship or environment then there is a probable risk that the expected learning outcomes will not be achieved.

3. Risk and risk management

The structure of clinical learning environments is very unlike the structure of the classroom setting. The clinical environment is diverse and affected by many factors including ward settings and the large volume of health professionals, teachers (facilitators), clients and their families^[10]. In health and health education, and given the implications of exposing students to patients, the business of sending students into “live” clinical environments requires regulation around how both facilitators and students are managed and coordinated by representatives of the universities.

Given the current complexities in health and health education, risk management processes dictate that a more structured and considered approach be taken to regulation of foreseeable risks for students exposed to the clinical environment. Education providers seek to minimise the risk that they expose both themselves and their students to, through use of regulatory systems known as risk management processes. These systems are designed to create ‘zero tolerance’ of risk, to prevent any failure that could harm a service user or member of the public.

4. Risk management of students on QUT WIL placements

At QUT Unit Coordinators (UCs) are employed/allocated to manage and supervise both the students’ progression toward achievement of professionally mandated standards, as well as the abilities of the facilitators that students are allocated to during their WIL experiences. In order to meet the needs and learning requirements of both groups, facilitator and student surveillance is necessary. Management of WIL placement is generally done remotely by the UC so as to avoid the need for individual hospital visits to see how students and facilitators are working together and toward students’ achievement of the learning objectives of the placement. Given the often large numbers of students and the limited personnel and resources available to manage WIL experiences at this local level, this UC has adapted a system from the QUT Risk Management Process to manage and identify both facilitators and students “at risk” in the complex nexus of WIL experiences.

5. Identifying risk

Strictly defined, risk is the probability that a hazard will give rise to harm^[11] and includes “... the identification, assessment and prioritization of risks followed by ... economical application of resources”^[12:29]. Two further areas of risk can be clearly identified as “hazards” which need to be managed in the pursuit of producing qualified nursing graduates:

1. Facilitators at risk of not supporting and assessing students within the WIL environment.
2. Students at risk of failure to apply theory to practice

5.1. Facilitators at risk

Facilitators are employed on the basis of the size and scope of their professional and clinical experience. Generally considered “experts”, facilitators are skilled in nursing knowledge – both practical and theoretical. However, an educational qualification is not a necessary component of employment. Institutional knowledge about local “know how” and an ability to “fit in” with organisational personalities can be more valued than evidence of a facilitators’ ability to assess and support students pursuing completion of their WIL experience. Facilitators have varying degrees of experience as clinical guides

and may or may not be confident in marrying the assessment criteria of university expectations with the students' demonstration of their knowledge.

A survey of university assessment policies in Australia identified that many universities lack policies and processes that recognise the need for assessment approaches ^[13], particularly in relation to WIL experiences. If clarity around institutional policies and processes are not enacted, facilitators are “at risk” of not assessing students effectively, not supporting their development toward becoming a RN. This means that they do not meet the principles of WIL experiences in the way in which they were designed to be used: that is as a means of bridging the theory and practice of the discipline.

5.2. Students at risk

It can be assumed that nursing students commencing WIL placements present some level of risk. This risk is mitigated by the university's curricula which prepares and assesses students with a set of compulsory competencies that must be achieved before commencing placement. A further step to mitigate risk is the healthcare institutions' own health and safety inductions, orientation and observation periods and early close supervision. However, within general student cohorts it is recognised that due to the widening participation push, commencing students are from a broader range of educational experiences ^[14, 15] and may be at risk of not meeting university expectations. Identified risk groups include: low SES, first-in-family, ATSI, Culturally and Linguistically Diverse Backgrounds (CALD), rural and remote background, and mature-age students. Although these student cohorts bring valuable world experiences, research on attrition rates indicate they may experience more challenges in academic and WIL contexts. These cohorts may be challenged by educational gaps, language competencies, cultural adjustments, family commitments and/or financial hardships. These factors may negatively impact on the WIL experience, and thus they are potentially at risk of not meeting expected outcomes.

6. Facilitator and student management spreadsheet

QUT Nursing students are assessed against the four broad domains of nursing practice. Students need to receive a satisfactory grade from their facilitator in WIL experiences. Likewise, facilitators need to provide learning opportunities for students to demonstrate their skills and knowledge across these four domains.

In the risk management form, facilitators are sent a weekly form and asked to provide a single example that illustrates how the student has demonstrated each domain of practice. This allows the UC to identify risk in both the student and facilitator population: in students – whether they are demonstrating competence against the professionally mandated standards, and in facilitators – whether they are able to identify pertinent examples of student practice which justifies their assessment. As 40 facilitators may be reporting within a calendar week all data is imported back into a master spreadsheet so that multiple facilitator and student data can be checked for consistency

7. Analyse risks

7.1. Identify existing controls

Control is exerted by the UC managing specific clinical units. Driven by university processes and influenced by an understanding of professional standards, the UC adjusts documentation to ensure the best outcome is available for students. From clinical feedback the UC rapidly identifies learning issues, the facilitators' ability to document concerns and strategies that focus on solutions.

7.2. Determining the likelihood and consequences of risk

Likelihood refers to the chance that something might happen. It can be defined, determined, or measured objectively or subjectively and can be expressed either qualitatively or quantitatively. In this circumstance, the likelihood of risk is assessed qualitatively through an examination of both student performance and facilitators' ability to effectively report student learning concerns. All students are likely to be at risk for two reasons:

1. Unless UCs examine grades for all students participating in their unit, they are unlikely to know about previous placement or performance issues and their ability to apply the knowledge of their profession to its practice in the clinical environment.
2. The intersection of facilitator and student qualities is a constant variable. Given that UCs are unlikely to know of student performance issues, matching students with facilitators' particular qualities is challenging.

The consequences of not effectively managing students at risk are significant. First, an unsuccessful grade in a clinical unit means a delay in degree course progression. Second, students who have not been identified as being at risk are at further risk of providing unsafe care to the community. Finally, because students have the right to question WIL assessment processes ^[16], adequate facilitator documentation serves to minimise the risk of decisions being overturned on the basis of procedural processes not having been followed.

8. Evaluate risks

Evaluation of both student and facilitator factors leads UCs to an understanding of the potential problems that may occur within each clinical unit, subsequently allowing them to treat the risks to upholding high professional and university standards.

9. Treat risks

Treatment of these risks is managed by individual UC's. Where facilitators are at risk, the UC discusses issues raised with the facilitator and tailors support to suit the specific circumstances. Similarly, risks to student learning needs are identified, the UC intervenes with a variety of means to enhance student learning and mitigate particular risks to the clinical environment.

10. Monitor and review

Student and facilitator performance is managed weekly when students are in WIL placements and forms the basis of further consultation. The spreadsheet allows the UC to easily determine which group may need assistance and to best provide targeted support.

11. Communicate and consult

Based on the monitoring and reviewing done previously, the UC appropriately communicates and consults with relevant stakeholders: 1) the facilitator on how to manage at risk students more effectively; and/or 2) the facilitator on how to facilitate more effectively; and/or 3) the student about further university interventions to support learning.

12. Conclusion

The early identification and management of students "at-risk" is integral to success and ultimately supports the concept of lifelong learning. The broad aim of the WIL agenda is students achieving professional competence, not merely as a profession, but in terms of mastering skills and attributes required to function effectively in diverse situations in diverse real-world contexts. This requires close surveillance by facilitators. However, facilitators require as close surveillance of their practice as students do. This will ensure that Nursing's professionally mandated standards are upheld and that the community receives safe and effective care.

Adherence to QUT's risk management process has been integrated into this innovative system of early identification of students and facilitators "at risk". Students who are at risk of not performing at a satisfactory level and facilitators who are at risk of not assessing students effectively need to be identified early. This initiative has led to improvements in the early identification of students and facilitators "at risk" so as to initiate strategies that can help to avoid negative consequences such as inappropriate assessment and student failure while ensuring safe patient care.

References

1. Dewey, J., *Experience and education*. 1938, New York: MacMillan.
2. Gopee, N., *Lifelong learning in nursing: Perceptions and realities*. Nurse Education Today, 2001. 21(8): p. 607-615.
3. Lambert, V. & M. Glacken, *Clinical education facilitators: A literature review*. Journal of Clinical Nursing, 2005. 14(6): p. 664-673.

4. Billett, S., *Knowing in practice: re-conceptualising vocational expertise*. Learning and Instruction, 2001. 11(6): p. 431-452.
5. Clare, J., et al., *Curriculum, clinical education, recruitment, transition and retention in nursing: AUTC Phase One Final Report*. 2002, Flinders University: Adelaide, Australia.
6. Cooper, L., J. Orrell, & M. Bowden, *Work integrated learning : A guide to effective practice*. 1st ed. 2010, New York: Routledge. xiv, 221.
7. Australian Health Practitioner Regulatory Agency. *Nursing and Midwifery Board of Australia*. 2013 [cited 2013 29 October 2013]; Available from: <http://www.nursingmidwiferyboard.gov.au/>.
8. Powell, A.T., *"And I was only just becoming": On being a new nursing graduate in transition*, in *Faculty of Education*. 1998, University of Sydney: Sydney. p. xi, 166 leaves.
9. McKenna, K. & S. Wellard, *Discursive influences on clinical teaching in Australian undergraduate nursing programs*. Nurse Education Today, 2004. 24(3): p. 229-235.
10. Papp, I., M. Markkannen, & M. von Bonsdorff, *Clinical learning environment as a learning environment: Student nurses' perceptions concerning clinical learning experiences*. Nurse Education Today, 2003. 23(4): p. 262-268.
11. Mohanna, K. & R. Chambers, *Risk: What's that all about then?*, in *Risk matters in health care: Communicating, explaining and managing risk*, K. Mohanna & R. Chambers, Editors. 2001, Radcliffe Medical Press: Abingdon, Oxon.
12. Hubbard, D.W., *The failure of risk management: Why it's broken and how to fix it*. 2009: Wiley.
13. Orrell, J. & S. Parry, *An assessment policy framework: A Carrick Institute study*. 2007: presentation to Macquarie University Assessment Working Party, Sydney, August.
14. Devlin, M., et al., *Effective teaching and support of students from low socioeconomic status: Resources for Australian higher education*, D.o.I. Office for Learning and Teaching, Industry, Science, Research and Tertiary Education, Editor. 2012: Sydney, Australia.
15. Priest, A., *"I have understanding as well as you": Supporting the language and learning needs of students from low socio-economic status backgrounds*. Journal of Academic Language and Learning, 2009. 3(2): p. A70-A81.
16. Queensland University of Technology. *Review of grade and academic rulings*. 2015 [cited 2015 24th March 2015]; Available from: http://www.mopp.qut.edu.au/E/E_09_01.jsp.

ACTIVATING LECTURE WITHIN HIGHER EDUCATION – TODAY AND PERSPECTIVE

Mariana Sirotova

Pedagogy Department at Faculty of Arts of University of St. Cyril and Methodius in Trnava (Slovakia)

Abstract

Higher education responds to changes in society in a flexible way. For higher education, issues of activating personalities of university students come into being. The aim is the university student's overall development as a future graduate in order to be accepted in the labour market as a highly qualified professional with well developed personal and professional competences. University lecture as a basic form of higher educational process provides a space for personal development of the student. The study compares monologic and activating lectures and presents pilot results of its experimental verification by the technique of rotation factors.

Keywords: *lecture, teacher, student, experimental verification*

1. Methodology of an experiment by using the factor rotation technique

The experimental method is one of the most challenging research methods and therefore the preparation phase and the realization require selecting the correct experiment technique and its parts. Based on our previous experience with the realization of the experimental method by using the technique of parallel groups we chose this time a more challenging, but at the same time more informatively reliable technique of factor rotation.

Based on the issue at hand our experiment focused on comparing the efficiency of monologue versus activating lectures. Our most significant criteria was the degree of achieved educational results, meaning the specific change in student's knowledge, abilities and skills. Given the complexity of this issue it is necessary to focus on two basic categories when evaluating the results of an educational process. First category is a student's ability to theoretically master knowledge and to present it in a knowledge test, the second one is his/her ability to implement this knowledge into the process of solving real-life model situations (Sirotová, 2014).

Causality is the core of an experiment and it represents a causal conditionality. When realizing the experimental method it is thus necessary to specify a cause – a phenomenon whose causal effect we are observing - and a measurable consequence for verification of the set hypothesis. The first step is to specify the phenomenon which in our experiment is the independent variable. The second step is to stipulate the consequence or the dependent variable - the outcome resulting from performing the experiment (the independent variable). In our experiment we chose the organization and the methods of an activating lecture as the independent variable. To satisfy the objective measurability we chose two categories as the dependent variables – acquired knowledge presented in a knowledge test and the knowledge implemented into solving real-life model situations. We chose these two categories based on the essence of university education process which aims to not only teach students encyclopaedia-type knowledge, but to also teach them to utilize the acquired knowledge in their real professional life.

The target of this experiment was to evaluate the efficiency of monologue versus activating lectures. In simple terms the difference between a monologue and an activating lecture lies in the organization and the methods used by the university teacher. In our experiment a monologue lecture was represented by a monologue presentation with the use of some didactic equipment. We used more types of activating lectures – a lecture using a problem presentation and a discussion, a lecture of partial searching, visualization lecture, binary lecture, a lecture with planned mistakes and a lecture using the EUR strategy. Due to the ongoing statistical processing of the statements from knowledge tests and model situations we are going to include only the arithmetical processing of the results.

In our experiment we used the technique of factor rotation. The core of this technique lies in the status alteration of the experimental and the control groups during the experiment realization. The change

is caused by working with the independent variable. The experiment is performed in both groups and thus their status alters from the experimental to the control group and back again. The experiment itself is performed in two stages. The pre-test and the post-test investigation of the subjects' characteristics was realized at the beginning as well as during the experiment when the changes of the groups' status were occurring.

We used the same plan when searching for the subjects' characteristics in both categories - evaluating students' knowledge presented in a knowledge test and the implemented knowledge utilized in solving of real-life model situations. We also used tests of knowledge and a content analysis of text documents as supplementary methods. To try to obtain an objective picture of the subjects' knowledge we used knowledge tests with multiple choice answers and the dichotomous scoring system (0 – 1). If a subject chose the correct answer, he/she was given one point, if he/she chose an incorrect or no answer, he/she received no points. During the realization of the experiment we used two types of knowledge tests which were tied to the content of lectures differentiated into two phases, same as the experiment. Both knowledge tests were then used in both groups A and B. The second supplementary method was the content analysis of a text document, the text documents in our experiment were represented by the real-life model situation solutions. Similar to the knowledge tests, we used two types of model situations tied to the content of the lectures in particular phases of the experiment. Within the analysis part of the experiment we chose the most commonly used qualification procedure of finding the frequency of an analytical category in a text. This qualification procedure is most suitable for processing texts of the written model situation solutions. In the first phase we stipulated the analytical categories of the content. The analytical categories of the content are fixed indicators for sorting entry units and in our experiments they were represented by possible correct solutions to a given model situation. Entry units are important elements of the content that can be represented either by one word expressing a term, by a collocation expressing an association of terms, a sentence expressing a statement with a certain information value or a more complex sentence clusters. In the analysis part of the model situations in our experiment the entry units were represented by the most commonly occurring thoughts and model situation solutions expressed by more complex sentence clusters which didn't necessarily have to be written in the same words, but their information value, their meaning, were the same. These were then allocated to analytical categories which had been pre-set as the correct model situation solutions and the number of entry units then represented the score of the adequate solutions of a subject.

2. Characteristics of the experiment subjects

The factor rotation technique, same as any other experiment technique, has its positives and its drawbacks. One of the positives is the fact that the researcher doesn't need to work with balanced subject groups and also there is no need to check for undesired factors influencing the realization of the experiment. This was the main reason why we chose this particular technique. In a university environment it is difficult to secure uniformity of groups participating in an experiment. The fixed allocation of students to groups within a study subject prevented us to realize a deliberate selection which seems to be preferable when using the technique of parallel groups in an experiment. The deliberate selection is conducted based on the criteria of relevant characters, meaning those characters of the basic pool which are relevant for given investigation, but in our case based on the choice of the factor rotation technique, the deliberate selection was not necessary. The first group (group A) consisted of the second year bachelor students studying social pedagogy. The second group (group B) consisted of the first year master's degree students studying the teaching of academic subjects in various specializations. Details regarding the number of subjects in each group and their age and gender can be found in Table No. 1.

Table 1. Characteristics of the subjects in experiment groups

group	indicators											
	gender					age						
	male		female		total	below 20		21 - 25		above 26		Average age
	count	%	count	%		count	%	count	%	count	%	
A	2	9	20	91	22	19	86	2	9	1	5	20
B	3	14	19	86	22	0	0	22	100	0	0	21

3. Experiment results analysis and interpretation

The experiment was carried out during the winter semester of 2013/2014 academic year among the students of Special Pedagogy. This study subject is taught via lectures and its aim is to introduce students to the topic of special pedagogy in order to obtain specific knowledge and to build on the knowledge from previous subjects like the Special Pedagogy Seminar, Educational Problems at Schools, Conflict Solving and other selective subjects. The fact that Special Pedagogy is taught in two study programs enabled us to realize the experiment during one semester. During the 12 semester weeks we performed 6 monologue lectures and 6 activating lectures. At the beginning we informed the students about the aim of the lectures and their organization as well as about the criteria for obtaining the final evaluation which consisted of passing four knowledge tests and adequately solving four model situations. The results of the first and the third knowledge tests and the solutions to the first and the third model situations, however, did not influence the final evaluation of the student. Before the experiment we created two separate syllabi for the subject Special Pedagogy. In the first syllabus for Group A the first six topics were taught by using activating lectures while the other six were taught via monologue lectures. The second syllabus for Group B consisted of the same topics, the first six lectures were, however, taught by using monologue lectures and the other six via activating lectures. We didn't change the order of activating lectures, in both phases the sequence was the same starting with the lecture using a problem presentation and a discussion, followed by the lecture of partial searching, visualization lecture, binary lecture, lecture with planned mistakes and finally the EUR strategy lecture. We had had several years of experience with activating lectures as well as with performing an experiment, which in the past was realized via parallel group technique. To obtain more objective results we decided to use the more complex factor rotation technique this time.

The factor rotation technique enables us to determine the increase in subject's knowledge in three areas (Chráska, 2007). The first is the area of the increase in knowledge caused by the experiment's impact which can be expressed as follows:

$$(m_{A2} - m_{A1}) + (m_{B4} - m_{B3})$$

We can also determine the increase in knowledge without the experiment's impact:

$$(m_{B2} - m_{B1}) + (m_{A4} - m_{A3})$$

And the change which was caused by the independent variable (experiment's impact) can be expressed as follows:

$$[(m_{A2} - m_{A1}) + (m_{B4} - m_{B3})] - [(m_{B2} - m_{B1}) + (m_{A4} - m_{A3})]$$

When analyzing the increase in the production of adequate real-life model situation solutions we used the same procedure as with the increase of knowledge determined through knowledge tests. We used the sums of arithmetic average scores of knowledge tests and their final difference to determine the change caused by the independent variable, in our case the activating lectures. The table No. 2 shows the increase in knowledge caused by the impact of the experiment.

Table 2. Increase in knowledge impacted by the experiment

	group A	group B
1. phase	m_{A1} 15,86	x
	m_{A2} 32,64	x
2. phase	x	m_{B3} 15,73
	x	m_{B4} 32,36

Note: the green color indicates when the subjects in a particular group were in the position of the experimental group

Table 3. Increase in knowledge without experiment's impact

	group A	group B
1. phase	x	m_{B1} 15,23
	x	m_{B2} 29,32
2. phase	m_{A3} 16,05	x
	m_{A4} 29,82	x

Note: the green color indicates when the subjects in a particular group were in the position of the experimental group

In the pre-test investigation of the subjects' characteristics we had determined that the average scores of the didactic tests in group A had been 15.86 and in group B 15.23. Comparison of the arithmetic averages of both groups (the difference of only 0.63) showed a relative uniformity, in terms of knowledge levels, of both groups at the beginning of the experiment. When using the factor rotation technique the uniformity of groups is not a relevant condition as is the case with the technique of parallel groups. In the latter technique the condition of groups' uniformity is the basic precondition of obtaining accurate results. If the groups were not equal, the differences in the dependent variable may not be caused by the independent variable, but by the initial differences between the groups. Based on the fact that in our experiment the groups were equal we can assume that the differences in the results determined in the post-test investigation of the subjects' characteristics were caused by the experiment's impact.

In the factor rotation technique when determining the increase in knowledge the most relevant indicator is the sum of the differences between the pre-test and the post-test results. The increase in knowledge caused by the experiment's impact is represented by the value of 33.41 and the increase in knowledge without the experiment's impact is 27.86. These numbers represent the average points gained from the knowledge tests in particular phases of the experiment.

Table 4. Numerical values of the change impacted by the independent variable

	group A		group B	
1. phase	<i>m_{A1}</i>	15,86	<i>m_{B1}</i>	15,23
	<i>m_{A2}</i>	32,64	<i>m_{B2}</i>	29,32
2. phase	<i>m_{A3}</i>	16,05	<i>m_{B3}</i>	15,73
	<i>m_{A4}</i>	29,82	<i>m_{B4}</i>	32,36

Note: the green color indicates when the subjects in a particular group were in the position of the experimental group

However, the important indicator here is the difference between the sums of the increases in knowledge caused by the experiment's impact and without the experiment's impact. The arithmetic average of the scores gained in the pre-test and the post-test investigation of the subject's characteristics realized through didactic tests was 5.55. This difference indicates that our assumption at the beginning of the test, that students educated through activating lectures would obtain more knowledge than students taught through monologue lectures, was correct. The accuracy of this statement, however, needs to be further confirmed by the statistical processing of the results using the F-tests.

The second investigated category of the dependent variable in our experiment was the ability of students to implement their knowledge in the solutions of real-life model situations. To process our findings we used the same procedure as with the first investigated category, the acquisition of theoretical knowledge. Based on the limited length of this article, we are going to introduce only the verbal commentary connected to the findings in this category without the graphs.

In the pre-test investigation of the subjects' characteristics in the first phase of the experiment the arithmetic average score of the suggested adequate solutions of real-life model situations in group A had been 2.27 and in group B 2.45. Comparison of the arithmetic averages of both groups (the difference of only 0.18) showed a relative uniformity of both groups at the beginning of the experiment. As we stated before when using the factor rotation technique the uniformity of groups is not a relevant requirement. Because of the uniformity of the subjects in our groups we can expect that also in the second category the differences in results between the pre-test and the post-test investigation of the subjects' characteristics in the experimental phase would be caused by the independent variable.

In the factor rotation technique when determining the increase in the production of adequate real-life model situation solutions impacted by the experiment the most relevant indicator is the sum of the differences between the pre-test and the post-test results in particular phases of the experiment. The increase in adequate solutions caused by the experiment's impact is represented by the value 6.55 and the increase in adequate solutions without the experiment's impact is 1.64. These numbers represent the average scores gained from suggested adequate solutions in particular phases of the experiment.

However, the significant indicator here is the difference between the sums of the increases in the adequate solutions caused by the experiment's impact and without the experiment's impact. The arithmetic average of the scores gained in pre-test and the post-test investigation of the subject's characteristics realized through the model situation solutions was 4.91. This difference indicates that our assumption at the beginning of the test, that students educated through activating lectures would suggest more adequate solutions to real-life situations than students taught through monologue lectures, was correct. The accuracy of this statement, however, needs to be further confirmed by the statistical

processing of the results using the F-tests. At the moment we are conducting the statistical processing to determine the statistical value of the stated differences.

4. Conclusion

University education flexibly responds to the changes in society through creation of new study programs, through change in the content of existing study programs, through change in the methods of evaluation of study results and through change in the position and mutual relationship between teachers and students. Current times are characterized by an explosion of knowledge and its inclusion in the study and its practical applicability require a new way of pre-gradual education. Requirements of the job market are increasingly high and demanding and graduates are no longer able to succeed in securing a job only based on their theoretical knowledge, but mainly by developing their competencies. Besides the professional competencies employers require highly developed critical and comparative thinking, problem solving, creativity, team work, communication skills and advanced evaluation skills enabling the candidates to take adequate decisions while at the same time be flexible in their actions. Based on this fact it is necessary to increase the frequency of activating lectures in higher education and activating methods within other types of university teaching mainly in seminars and exercises. Activating methods develop cognitive processes in students' personalities, critical and comparative thinking, communication skills, ability to work in a team and with a team and thus help to develop managerial skills, axiological processes, teach students to set adequate criteria of evaluation, to use correct methodology of evaluation and self-evaluation and, last but not least, help to develop students' creativity. Besides the above mentioned positive outcomes they also increase students' motivation to study, improve the atmosphere during learning and are an important condition of developing a mutual feeling of trust, collegiality and participation at the education process of a university.

References

- Danek, J. (2014). Pedagogická komunikácia na vysokej škole. Trnava: UCM.
 Droščák, M. (2014). Aktivizujúce vyučovacie metódy v praxi vyučovania strednej školy. Trnava: UCM.
 Frýdková, E. (2010). Rodičia ako edukační partneri školy. Trnava: UCM.
 Chráška, M. (2007). Metody pedagogického výzkumu - Základy kvantitatívneho výzkumu. Praha: Grada.
 Siroťová, M. (2014). Vysokoškolský učiteľ v edukačnom procese. Trnava: UCM.

THE ART OF TEACHING IN TEACHING ART

So-Lan Wong

Hong Kong Institute of Education (Hong Kong)

Abstract

I mainly teach teaching method in visual arts education of PGDE and BEd program. I believe experiential and cooperative learning can help students grasp the concept of teaching. Therefore, I try to seek opportunities for students to have trial teaching in a real classroom instead of micro-teaching. In the process of learning how to design a lesson, I recognize that students always care about art making procedures and blur the learning focuses, and therefore they cannot write particular criteria to differentiate the outcomes. After trial teachings, student-teachers seem to be able to recognize the problems at post-lesson conferences and their teaching reflection. However, the learning focuses and criteria of learning outcome were obscured by procedures again and again at their block practice.

What problems or difficulties student-teachers were facing? I initiated a research project named Transforming outcomes into learning. An art educator was invited to teach a group of student-teachers of mine. As a participatory observer, I observed how student-teachers learnt through class observation and interviews. There are three major findings: (1) student-teachers didn't believe what they have heard from the instructor but believed the interpretation of their peers which might be wrong; (2) teaching should be thought of as the application of the mind, student-teachers seemed to have mastered teaching concepts cognitively but failed to apply the theories in practice; (3) all student-teachers are able to learn how to teach, the difference is the pace of learning.

If teaching is not innate ability but depending on the way it is fostered, the researcher don't understand why learning by doing, learning by discussion and learning from experience failed to let student-teachers master a proper teaching design and teaching practice. Although student-teachers believed that they have learnt teaching through trial teaching and peer critiques, the researcher still thinks that there is a gap between their theory and practice in teaching visual arts. This is the problem the researcher need to solve with student-teachers in future.

Keywords: *Teaching and learning, student- teacher, teaching visual arts.*

A CASE STUDY OF STUDENTS' DECISION-MAKING ABOUT POSTGRADUATE EDUCATION IN CHINA

Dan Liu

School of Education, University of Nottingham (UK)

Abstract

This research explores the main factors influencing students' choice of postgraduate education at a case university, the G University in the Southeast China. The research was conducted in two phases. In the first phase, 616 questionnaires were distributed among the targeted students with 381 returned in order to get a general picture of the students' reasons for PG education at the case university. In the second phase, 30 students who indicated their willingness in the questionnaires for the follow-up interviews were interviewed to gain an in-depth understanding of their decision-making. It is found that employment prospects, personal interest, the reputation and location of the institution are the main factors influencing their choice of postgraduate education. By enquiring into the students' decision-making process for undertaking postgraduate education in the specific Chinese social and cultural context, it contributes to the literature on students' decision-making process about higher education. In addition, the findings will also provide some informed knowledge for Chinese further and higher education for better understanding its students and thus providing better service for them. This knowledge could also provide informative information to those international universities who are competing for recruiting more Chinese students.

Keywords: *Students' decision-making, postgraduate education, cultural capital, social capital, guanxi.*

1. Introduction

In the recent decade, there has been a rapid expansion in higher education in China. Above all, there has been a surge of enthusiasm among students for postgraduate (PG) studies in recent years. The number of enrolled students for master degree increased from 145,443 in 1995 to 1,793,953 in 2013 (NBS, 2013). However, whether this trend will be kept has been questioned as China began to charge tuition fees for all its postgraduate programs in the autumn of 2014. Under the new policy, yearly tuition fees for master's degrees and doctorates in academic disciplines are capped at 8,000 yuan RMB (800 pounds) and 10,000 yuan RMB respectively (Anonymous, 2013). This new tuition scheme marks the end of a system allowing government-funded postgraduate programmes to enjoy tuition fee waivers in China (Anonymous, 2013). Therefore, it is expected that the total number of students going for postgraduate education will decrease in the near future.

Simultaneously, the options for students have been broadened as a European higher education market with intensified competition between universities has appeared. The total number of Chinese students studying overseas rose from 145,443 in 1995 to 1,793,953 in 2013, making China the world's number one source country for overseas students (Wang, 2012). In 2013, students going abroad for master degrees accounted for 52.7% of the total Chinese studying overseas (Anonymous, 2014).

As the number of new enrolment of postgraduate education in mainland China is expected to decline and the universities are competing not only nationally but internationally, a comprehensive understanding of the postgraduate students' choice of higher education has become a necessity for domestic higher education institutions. It helps to gain informative knowledge about the recruitment market, and is central for universities to develop institutional positioning in an increasingly competitive higher education environment (Maringe, 2006).

Despite the importance of understanding students' choice of higher education; in the context of China, related research is limited. Most of the research has been focused on Chinese students' choice of higher education for overseas studies (For example, Fang & Wang, 2014; Lee & Morrish, 2012; Liu, Hung, & Chung, 2013). There are a few research studies specifying Chinese students' choice of domestic higher education in mainland China, and still fewer on Chinese students' choice of domestic postgraduate studies.

Thus, my research intends to fill the gap. It aims to explore the main factors influencing Chinese students' choice of domestic postgraduate education. The G University is selected as a case for study. The specific research questions are:

1. What were students' main reasons for undertaking postgraduate education?
2. Why did they choose their particular subject for study?
3. Why did they choose the G University as their place for study?

The paper is set out as follows: The next section introduces the research design. Next, the findings are presented. Finally, the paper ends with the discussion and conclusion.

2. Research design

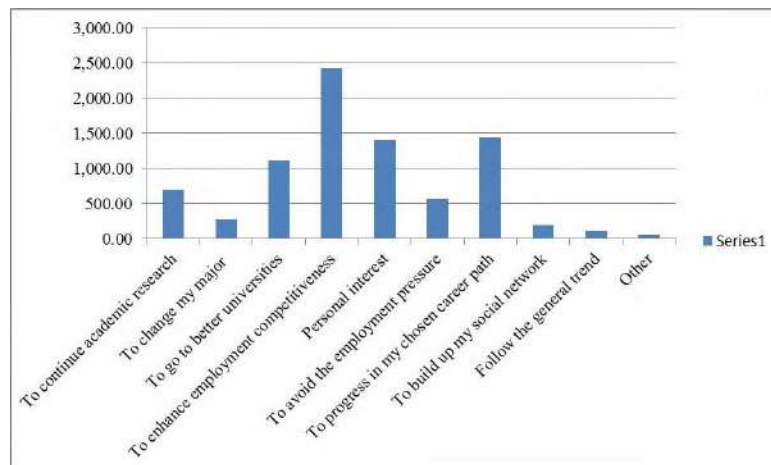
This research used an in-depth case study approach to explore students' choice of postgraduate education in China. The G University in the Southern part of China was chosen as a case for study. The field research was conducted in two stages. For the first stage, 616 questionnaires were distributed to the first-year postgraduate students at the G University. 383 questionnaires were returned with a return rate of 62%. It aimed at obtaining the general background information of the students as well as their main reasons for undertaking postgraduate education as well as for choosing their specific major and the G University for PG studies. For the second stage, from those who indicated their willingness to participate in the follow-up interview, 30 students were selected for the follow-up semi-structured interviews. This was aimed to clarify and expand their answers on the questionnaire and obtain relevant new information, thus to explore the topic in greater depth.

3. The results

3.1. What were students' main reasons for undertaking PG education?

As shown in the following Figure 1, according to the calculation of the importance of each option, students undertook postgraduate education mainly to enhance their employment competitiveness, to progress in their chosen careers and to go to a better university (compared with their undergraduate university). 'Personal interest' was discussed in detail in the second research question as students clarified in the interviews that their 'interest' indicated here refers to interest in specific major of study.

Figure 1. Students' Main Reasons for Undertaking PG Education



Twenty interviewees out of thirty decided to undertake postgraduate education mainly because they wanted to improve their employment prospects. This is illustrated in the following aspects: 'more job opportunities', 'higher salaries' and 'going to an elite university'. Take 'going to an elite university' as example, educational credentials from elite universities, especially from '985' or '211' universities¹ are essential to open the door for certain jobs. Most of the students intended to go to an elite university for postgraduate education. For instance, *Cao* said:

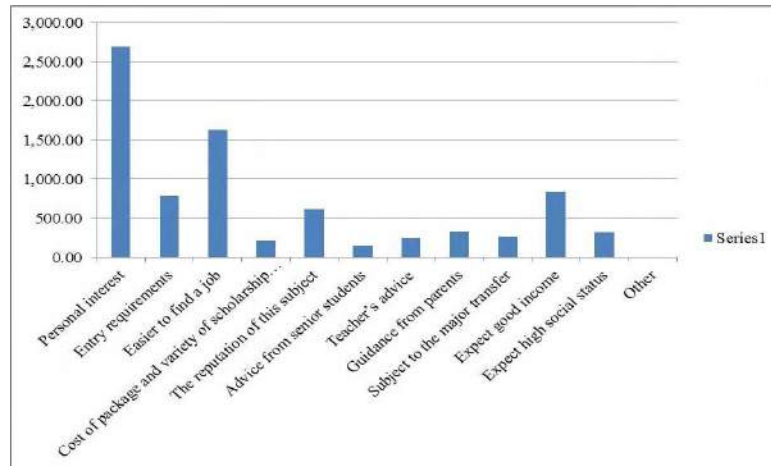
I graduated from a non-elite university. I thought if I went to find a job with a degree from this university, I would not have been recognized by the employers. Thus, I wanted to pursue postgraduate education at an elite university; in that case, I would have greater chances of finding a good job.

¹These are the projects of National Key Universities and colleges initiated in 1995 and 1998 respectively. These two projects were aimed to raise the research standards of high-level universities and the reputation of the Chinese higher education system (see Wikipedia, accessed 8 October 2014. http://en.wikipedia.org/wiki/Project_211 and http://en.wikipedia.org/wiki/Project_985).

3.2. Why did they choose their particular subject for study?

As shown in the following Figure 2, according to the calculation of the importance of each option, students chose their major of study mainly out of their personal interest. In addition, ‘easier to find a job’, ‘good income prospects’ and ‘entry requirements of the major’ were also important considerations.

Figure 2. Students’ Main Reasons for Choosing Their Major of Study



Consistent with the quantitative results, the qualitative data showed that ‘interest’, ‘easier to find a job’ and ‘easier to be admitted’ constituted the three main reasons for students’ choice of particular subjects for postgraduate studies. Here I illustrate the two points: ‘interest’ and ‘easier to be admitted’.

3.2.1. Interest. Twenty-seven of the interviewees made it clear that ‘interest’ constituted one of the main reasons for choosing their major for postgraduate studies. Among those who indicated ‘interest’ as an important reason for their choice of field of study, they were asked further how they developed their interest. Family learning and teachers’ teaching style were the major two sources.

Family learning: Among the participants, seven of them developed certain interest or the habit of reading since at an early age, which was influenced by their cultural capital accumulation from their family learning. Parents who regularly read books at home formed a stimulating learning environment and acted as role models for their children. As a result, children picked up the learning habit since then. For instance, *Cheng* said:

I was thankful to my parents as they helped me develop a reading habit since I was young. Whenever they came back home from work, they would read books together with me, unlike many other parents who would watch TV or playing cards. Immersed in this environment, I developed a habit of reading and learning, and kept this habit since then...I was very interested in English and could always achieve high marks in English. Naturally, I chose English Interpretation both for UG and PG studies...

Teachers’ influence: The teaching method and style were found to be influential in shaping students’ interest towards certain areas. Influenced by teachers, some students developed their interest with regard to a particular subject. For example, *Lin* said:

We had a Linguistic class in the third year during undergraduate studies. I liked it very much. The teacher’s class was very attracting. What she taught was very easy to understand and interesting, which made me want to explore Linguistics in great depth. Naturally, I continued it for PG studies.

3.2.2. Easier to be admitted. Three of the interviewees mentioned that they got inside information in preparing for the postgraduate entrance examinations as they have special relationship (*guanxi* in Chinese), which was seen as a variant of the concept of ‘social capital’ (Qi, 2013). For example, *Guo* said:

I chose the major of European Studies at G University because my uncle from my mother’s side was at this university. He was a professor at the Centre for European Studies. My uncle then introduced some of his students to me and asked me to consult them about what and how I should prepare for the PG entrance examinations.

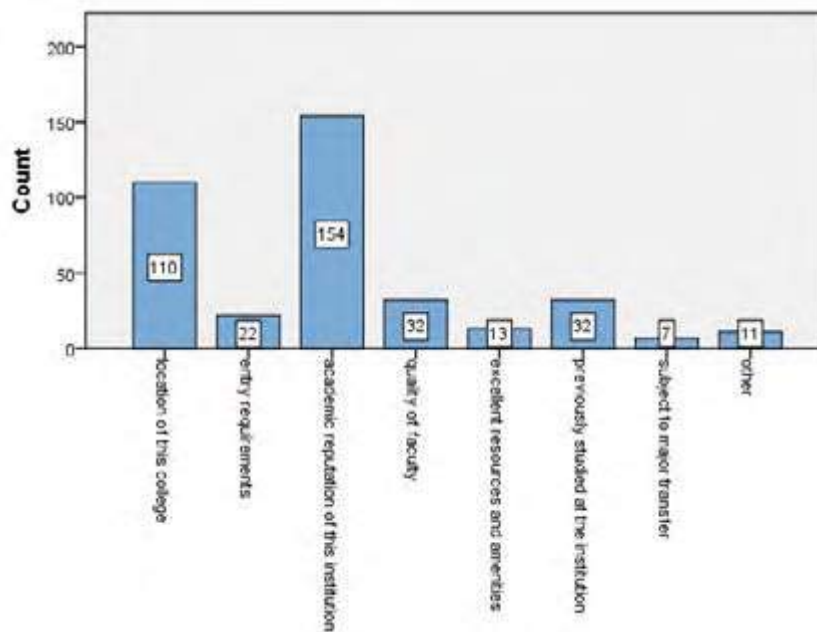
In addition, social capital built in the school context, which mainly refers to the alumni (or senior schoolmates) also played an important role in providing information source for students’ choice of major. For example, *Zhang* said:

One of my high school classmates introduced her senior schoolmate A to me. A latter introduced her classmate B to me, who is studying at the G University. B is studying the major I am learning. She told me how to prepare for the exams and introduced me a lot of books to read...Then I chose it.

3.3. Why did they choose the G University for study?

As shown in the following Figure 3, the two main reasons for students to choose the G University as their place of study were: the academic reputation and the location of this university.

Figure 3. Students' Main Reasons for Choosing the G University



4. Discussion and conclusions

The data showed that students' decision for undertaking postgraduate education was mainly motivated by potential employment prospects brought by a PG educational degree. In addition, students wanted to go to elite universities means that they understood the value of the 'signalling' effect of elite universities. Educational credentials from elite universities in China are essential to open the door for certain jobs. This confirms the findings by Li, Ding, & Morgan (2009), which showed that the 'signalling' effect—the major economic function of education is to help the employers to screen out individuals to tasks—is still influential in the Chinese labour market for higher education graduates.

In addition, the data showed that parental education and cultural capital were influential in students' formation of habitus. Some students could benefit knowledge increment or development of good learning habit in childhood from their family's cultural consumption patterns in daily lives, which further influenced their educational choices in their later life. This corroborated Bourdieu's theory of habitus (Bourdieu, 1977). It also confirmed that family lifestyles and cultural consumption patterns have an important impact on children's cultural formation and their perceptions of higher education (Davies, Qiu, & Davies, 2014; DiMaggio, 1982; Gao, 2011; Reay, 2004; Shaw, 2012).

In the absence of family learning, teachers' teaching style played an influential role in directing students' interest in their fields of study. Although teachers' influence on students' choice of programme has been reported elsewhere (Lichtenstein, Tombari, Sheppard, & Storm, 2014; Oliver & Kettley, 2010; Sjaastad, 2011), in China there has not been much research study in that area. The great positive impact of teachers on their students might be partly explained by the special teacher-student relationship dipped with Chinese traditional culture. In the Chinese tradition, students revere teachers and teachers are treated with open and presumably complete respect.

Finally, family social capital and social capital built in the school context also played important roles in providing information source for students' choice of major, which was said to be less frequently studied (Wu, Palinkas, & He, 2010). This is consistent with the findings by Coleman (1988), which concluded that family social capital plays an important role in transmitting parents' resources to their children for seeking advantages for ensuring their success in school education. Frequently turning to senior schoolmates for help seems to be a unique Chinese culture as it has not been reported elsewhere in research concerning students' choice of higher education. Several reasons accounted for that. Firstly, the postgraduate entrance exam is an intense competitive exam; hence students have to make full use of their resources in order to excel in it. In 2013, 3,838 students applied for the postgraduate entrance exam at the G University but only 908 were accepted. That is, an acceptance ratio of about 1: 4.2 (Anonymous, 2014).

Secondly, there is no definite reference book for many majors of studies for postgraduate entrance examinations by the G University. As a result, the only valuable resources, namely the senior schoolmates with previous experience in such examinations, were frequently asked for help. It is therefore implicated that in order to make efficient publicity; universities need to focus on creating a lasting alumni association for positive word of mouth among the potential applicants.

The research adds knowledge to Chinese students' choices of domestic postgraduate education. More importantly, it invites us to reconsider the cultivation aim of PG education in China, which was mainly to cultivate students with the abilities to engage in scientific research, whereas now it has been mainly seen by the students as a bridge to employment.

References

- Anonymous. (n.d.). China ends free postgraduate education. Retrieved September 19th, 2013, from <http://www.scienceguide.nl/201302/china-ends-free-postgraduate-education.aspx>.
- Anonymous. (October 2nd, 2014). Analysis on the Chinese students who going for overseas studies in 2013. Retrieved October 2nd, 2014, from <http://www.xinquanedu.com/zt/2014/zh/0206shui/>.
- Bourdieu, P. (1977). *Cultural reproduction and social reproduction*. New York: Oxford University Press.
- Coleman, J. (1988). Social capital in the creation of human capital. *The American Journal of Sociology*, 94, S95-S120.
- Davies, P., Qiu, T., & Davies, N. M. (2014). Cultural and human capital, information and higher education choices. *Journal of Education Policy*, 29(6), 804-825.
- DiMaggio, P. (1982). Cultural Capital and school success: The impact of status culture participation on the grades of U.S. high school students. *American Sociology Review*, 47(2), 189-201.
- Fang, W., & Wang, S. (2014). Chinese students' choice of transnational higher education in a globalized higher education market: A case study of W university. *Journal of Studies in International Education*, 18(5), 475-494.
- Gao, L. (2011). *Impacts of cultural capital on student college choice in China*. Lanham, Md: Lexington Books.
- Lee, K. C. C., & Morrish, C. S. (2012). Cultural values and higher education choices: Chinese families. *Australasian Marketing Journal*, 20(1), 59-64.
- Li, F., Ding, X., & Morgan, W. J. (2009). Higher education and the starting wages of graduates in China. *International Journal of Educational Development*, 29(4), 374-381.
- Lichtenstein, G., Tombari, M. L., Sheppard, S. D., & Storm, K. (2014). *Does teaching matter? Factors that influence high school students' decisions whether to pursue college STEM majors*. Paper presented at the 121st ASEE Annual Conference & Exposition, Indianapolis, IN.
- Liu, Y., Hung, F. S., & Chung, Y. P. (2013). Chinese students' choice of major when considering higher education abroad: The case of mainland China. *China: An International Journal*, 11(1), 94-112.
- Maringe, F. (2006). University and course choice — Implications for positioning, recruitment and marketing. *International Journal of Educational Management*, 20(6), 466-479.
- NBS. (2013). China Statistical Yearbook. Retrieved October 14th, 2014, from <http://www.stats.gov.cn/tjsj/ndsj/2013/indexeh.htm>.
- Oliver, C., & Kettley, N. (2010). Gatekeepers or facilitators: The influence of teacher habitus on students' applications to elite universities. *British Journal of Sociology of Education*, 31(6), 737-753.
- Qi, X. (2013). Guanxi, social capital theory and beyond: Toward a globalized social science. *The British Journal of Sociology*, 64(2):308-324.
- Reay, D. (2004). Education and cultural capital: The implications of changing trends in education policies. *Cultural Trends*, 13(2), 73-86.
- Shaw, A. (2012). Family fortunes: Female students' perceptions and expectations of higher education and an examination of how they, and their parents, see the benefits of university. *Educational Studies*, 39(2), 195-207.
- Sjaastad, J. (2011). Sources of inspiration: The role of significant persons in young people's choice of science in higher education. *International Journal of Science Education*, 34(10):1615-1636.
- Wang, H. (2012). A summary of China's development of students studying overseas in 2012. Retrieved October 14th, 2014, from <http://wenku.baidu.com/view/fbb8b49f6bec0975f565e200.html>.
- Wu, Q., Palinkas, L. A., & He, X. (2010). An ecological examination of social capital effects on the academic achievement of Chinese migrant Children. *British Journal of Social Work*, 40(8), 2578-2597.

FINAL DEGREE WORKS: A NEW CHALLENGE FOR THE FUTURE TEACHERS OF INFANT AND PRIMARY EDUCATION. (SOME PERSPECTIVES FROM EXPERIMENTAL SCIENCES)

Constancio Aguirre Pérez
University of Castilla-La Mancha (Spain)

Abstract

With the entry into force of the EHEA (European Higher Education Area) in the Spanish University Educational System, Higher Undergraduate Studies have disappeared (first cycle university studies of three years) including studies of Education (Infant and Primary Initial Teacher Training). Now these studies have become four-year graduate studies (240 ECTS credits) involving as all university studies a final project work (Degree Work). In this paper the results for the first Final Degree Work (FDW) of students supervised by professors of the Faculty of Education of Cuenca assigned to the area of knowledge "Science Teaching" are presented.

The mainly topics chosen by these students for the second part of their work should be oriented towards a project of Teaching Innovation in Infant and / or Primary Education. For guidance of tutors a significant percentage of them chose the topic of Environmental Education and Sustainability. The paper analyzes the issues, their quality and possibilities and future enhancements in order to meet the objectives set by our University in terms of competencies to be developed by future teachers, always from the perspective of Experimental Sciences.

Keywords: *EHEA, Final Degree Work, Teacher Training, Environmental Education and Sustainability , Science Education.*

1. Introduction

The first graduating class of Teacher Training Students of the University of Castille-La Mancha completed their studies during the 2013-2014 period, both in Early Childhood Education and in Primary Education as a consequence of the so-called "Bologna process" or adaptation of university studies to the European Higher Education Area in The Faculty of Education of Cuenca belonging to that University (Spain). One of the most important innovations of this new curriculum is the obligation of all students to present and defend orally, in front of a court faculty members, a "Final Degree Work" (hereinafter FDW) what is a prerequisite to finish the career and receive the title. That means having first passed all the subjects of the curriculum as well as having completed and passed the two periods of school practices (called Practicum I and Practicum II).

At the University of Castille-La Mancha and more specifically in the Faculty of Education of Cuenca a regulation of that FDW has been established that involves the realization by each student of a project, memory or original study (called *Final Degree Work*) always under the supervision of one or more directors. That must integrate and develop a reflection about the training contents received and about the skills and abilities acquired during the career:

The FDW must be aimed at the implementation of the general skills associated with the Degree. Specially, skills to train for the search, management, organization and interpretation of relevant data, usually in their area of study to make judgments that include reflection on relevant topics of social, scientific, technological or ethical issues, and to facilitate the development of a critical thought and a logical and creative judgment.

The FDW must demonstrate that the student has acquired all the competencies described for the title and, therefore, that he or she is prepared to exercise the professions for which the title trains.

To defend the FDW all the credits of the modules and materials that constitute the curriculum must be passed.

The FDW will consist in the development of a final written, work demonstrating the acquisition of skills, and an oral and public defence in court. Its defence with a dissertation before an examining board is an indispensable requirement to obtain the title.

Similarly, the Article 4.1 of the Rules states that: The FDW has to be realised under the supervision of an academic tutor who must be a teacher with teaching in the curriculum of the Bachelor degree. That teacher will be responsible for explaining to the student the characteristics of the work. For tutoring the student, guiding him in the development of it, and for ensuring compliance with the objectives, as well as to track and authorize its presentation and defence.

Given these requirements, some criteria were established for the distribution of the students among the different Departments of the Faculty. And these Departments made their own distribution among the different teachers within the department itself.

2. Context

In recent years, the environmental education (EE) has added new perspectives, before minority, to further the objectives concerning the development of attitudes and behaviour modification to broader development of competences. So, instead of the behaviour modification the goal of this new paradigm of Environmental Education goes further and can be expressed as to develop in the individuals "training for action" (Jensen & Schnack., 1994).

The inclusion of the Environmental Education in the educational system requires modify the traditional scholar culture by a new environmental or ecologist culture what implies integrating a number of tasks that appear disconnected. The question is "making more environmental the scholar curriculum for what some values, goals and conservation strategies are to be incorporated. (Fernández, M. J., 2003).

Experts and institutions are reiterating, for decades, founded appeals to understand the need to face the growing environmental degradation, depletion of resources and, ultimately, to the serious situation of planetary emergency in which we are immersed. (Vilches et al., 2008)

3. Lines of work/research for the FDW

The rules of the Faculty of Education state that: Before the beginning of each academic year, teachers who teach at the Faculty should propose a determined number of topics that will be communicated to the Commission of FDW. This Commission must publish a list of all topics or subjects). Otherwise, in the Faculty of Education of Cuenca it was established that the FDW should consist of two parts:

- The first part would deal with a reflection on the training acquired in which the student must demonstrate knowledge of the curriculum of the degree he has completed during the four courses of the chosen specialization. The must take into account the modules and subjects of it, the objectives and competences to be achieved doing special emphasis on their strengths, weaknesses and improvement proposals.

- The second part would deal with the practical application of what they have learned during the career through an innovative teaching experience or a little research to be carried out, if possible, during the course of the Practicum II (hereinafter P-II). Normally P-II and FDW are conducted along the second semester of the fourth year of the degree. To that end, the figure of the tutor matches for both tasks: P-II and FDW.

- If, for several reasons, the student made his FDW outside the period of the P-II, the teaching innovation proposal or small piece of educational research are allowed to have a merely theoretical but sufficiently founded character.

- One line of very general character that had to do with any topic of Science Education as much in Infant as in Primary Education, That is, prepare and develop any topic, teaching unit, concept, cross material etc. of the science curriculum in a way that could be considered new or innovative.

- Another one on an environmental topic trying to answer the question: *What can we do from the school side to contribute to a sustainable future?*

Precisely, our work has focused on students who opted for the latter option.

We must also say in this respect that the Faculty of Education of Cuenca established internal rules for tutoring the FDWs. These rules are basically summarised in a minimum of four compulsory interviews with the tutor for each student

- In the first tutorial, besides a first contact, each tutor establishes the rules and criteria, according the general rules the student must follow in order to get the tutor's authorization to proceed to the oral presentation of the work.

- In the second tutorial, it is expected that students bring a first draft of the first part of the work and an outline of the educational innovation topic or small research for the second part of the work.
- In the third tutorial it is expected that the student presents the first part of his complete work and a sufficiently developed advance of the second part.
- In the fourth tutorial the student must present the complete written work and the tutor has to authorize or not the oral presentation of the work.

4. Support materials for environment and sustainability topic and preliminary recommendations

Due the opportunity provided by the UCLM to open a space in *virtual campus* similar to what exists for other curricular subjects, a series of materials (links to web pages, PDF documents, presentations, statements, case studies, videos, interactive games, etc.) related to the environment, Sustainability and Education were hanged in it. So, they could be consulted by the students before deciding on the topic of work for the second part of the FDW. Students who were simultaneously going to do the P-II and the FDW were recommended to contact firstly with the school assigned to check the following:

- If the school had foreseen in its Educational Project a topic or issue related to the Environment and Sustainability.
- If, alternatively, there were a teacher or teachers interested in these issues and who were developing activities for this purpose.
- In any case, if it was possible to implement, during the period of the P-II, one or several aspects of the teaching innovation project and / or educational research proposed by the student or join a task of this nature that the school was carried out and contributing with ideas or innovative tasks that could be reflected in the FDW.

The tutor recommended that, before deciding on a particular topic, they must review the materials posted on Virtual Campus about the issue and also encouraged them to do their own bibliographic and web search on aspects that may interest them about the topic and that were not reflected in the materials made available on the website of the Faculty.

5. Students sample

During the academic year 13/14 the Science Education Department of the Faculty of Education of Cuenca mentored on the FDW a total number of 44 students as can be seen in the following chart:

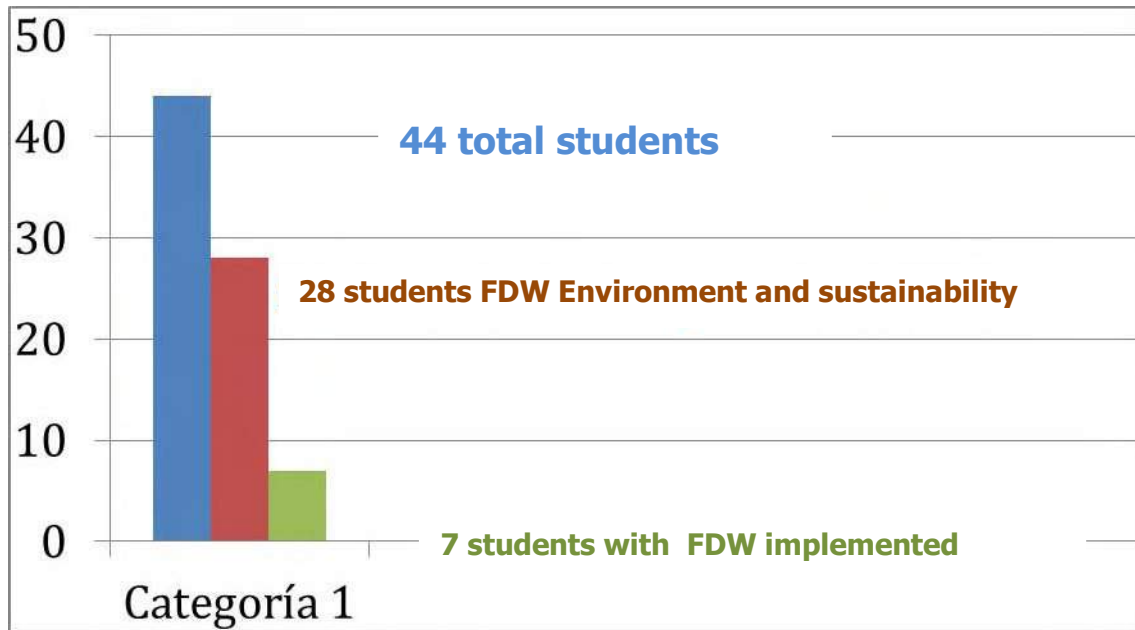
of which, as seen in the table, 28 of the 44 students have opted for topics related to Environmental Education and Sustainability, which represents 56.81% of the total but only 7 of them (a quarter of those who have chosen the theme) have been able to implement it during the execution of P-II. This has been true for several reasons: some of them had already completed a Degree on Education in one of their specialties and have validated the P-II, others had done the P-II before they have been assigned a FDW tutor, others did not found at the school where they have been made their P_II the possibility of implementing the project, etc. So that the initial objective of the P-II compatible with the FDW could not be completely satisfied this first year of implementation of the FDWs as the culmination of the Degree.

When all FDWs of this academic year were ended and presented, they were deeply analysed and all that works that responded to the proposed topic were categorized to be presented in this paper.

As we say, during the course 13/14 a total amount of 44 students were assigned to the Science Education Department of the Faculty of Education of Cuenca to be mentored of which:

- A total of 28 students (which represents 56.81% of the total) chose a topic related to the environment, environmental education and / or sustainability.
- 7 of them (representing 25% of those who chose this topic could implement the project during the period of their P-II:

Figure 1. Distribution of students according to their DW



The reasons why most students could not implement their project during the period of their Practicum II, as would have been desirable, were:

- Some of them had already completed a Bachelor of Education in one of its specialties and had validated the aforementioned P-II.
- Others had made the P-II before being assigned a FDW tutor, this was due to incidents and dysfunctions caused to be the first time that the FDWs were initiated at the Faculty.
- The rest did not find in the School of Practice assigned the possibility of implementing the project.

6. Conclusions

In this section we include the main excerpted ideas that the students have shown and teachers of the area (Science Education) have deduced from the experience after analysing, classifying and evaluating all the FDWs assigned to the Department. All the students manifested in their conclusions that the experience of developing a FDW on this subject has served them as very useful for:

- Increasing their awareness about the serious environmental problems that plague our planet at the present time and in the future, and the great responsibility as teachers they should take in preparation and awareness of the future generations about the same.
- Understand the need for the environmental education to be present in all compulsory education with interdisciplinary and transversal character from the earliest stages of education.
- Be able to warn of the lack of training of most teachers in this field since, to a large degree, it is not part of the training curricula and continuing education of teachers offered by public authorities or private entities that offer courses and seminars at least in sufficient quantity.
- Learn how to search for information in books, magazines, newspapers, other publications and on the internet about environmental issues in general and related to Education in particular.
- Realize the wealth of information on Environmental Education and Sustainability that can be easily found on the net. But, due to their wide dispersion and low systematization, it is necessary to make a critical analysis and a deep reflection to make the right selection of the information and resources that the web provides us with just a click from our computer, All this to be able to design lesson plans, activities, select videos, interactive games, etc., suitable for Infant or Primary Education in their different cycles.
- Understand the importance that children learn and internalize ideas of environmental protection and respectful behaviour to the environment such as recycling (Rule of the three "R", saving energy and water, respect for plants and animals, etc.) and that behaviour can be transferred to the family environment and serve as a trigger for families to gradually develop these behaviour if they did not made it previously.

- Learn to reflect and work for designing innovative educational proposals or small researches that go beyond the mere development of teaching units of a particular issue what is that they are more accustomed, because it is what they have learned and practiced during the 4 academic years of their Degree .

- Consider the enormous importance of the collaboration and involvement of the family both in the school as with their own children, as this will encourage the consolidation of the values worked in the classroom and the need for a collaborative work of all teachers at the school involved on the idea of sustainability.

- Implement and apply the general and specific competences associated with the degree.

- Training for searching, management, organization and interpretation of relevant data, usually in their area of study.

- Help them to make judgments that include reflection on relevant, social, scientific, technological or ethical character, and to facilitate the development of a critical, logical and creative thought and judgment.

References

Jensen, B. & Schnack, K. (eds.) (1994:) Action and Action Competence as Key Concepts in Critical Pedagogy. Studies in Educational Theory and Curriculum, vol. 12. Copenhagen: Royal Danish School of Educational Studies.

Fernández, M. J. (2003). Formación del Profesorado en Educación Ambiental: un estudio experimental. Salamanca: Publicaciones Universidad Pontificia de Salamanca.

Vilches, A. Gil-Pérez, D. Toscano, J.C. & Macias, O. (2008). Obstáculos que pueden estar impidiendo la implicación de la ciudadanía y, en particular, de los educadores, en la construcción de un futuro sostenible. Formas de superarlos. CTS, Revista Iberoamericana de Ciencia, Tecnología y Sociedad, 11, 4, 139-172

EDUCATIONAL MODELS OF COMPATIBILITY: SECONDARY EDUCATION AND HIGH LEVEL SPORT

Josep Solà Santesmas

*Sport, Physical Activity and Health (SAFE)
FPCEE Blanquerna, Ramon Llull University (Barcelona, Spain)*

Abstract

The aim of this article is to understand the educational models which seek to combine studies and high level sport in secondary education, and the involvement of clubs in their management. We analyze the model with a non-integrated project for athletes (adapted curriculum without responsibility as to the sport) and the integrated model (studies and sport under its responsibility). Given the awareness that few athletes benefit from institutionalized aids, the effectiveness of these models of compatibility is examined in order to help the other student athletes. In addition to the educational inspection, we interviewed directors of public and private schools (n= 5) as well as technical directors of a team sport (basketball) and an individual sport (swimming), with different requirements (n = 9), from a qualitative and descriptive approach. In order for this to be done, a semi-structured interview divided into three blocks was developed: genesis and structure of the project; concrete measures to combine studies and sport, and future prospects. The results show a greater legal and educational sensitivity toward the student-athletes, although the educational models that support them are still in a development phase. The variability of the studied indicators hinders the cohesion of solutions for an effective harmonization between school and sport. Due to this, endemic problems such as the legal deepening of projects, similar adaptation as in the studies of music or dance and rational flexibility of the calendar, still remain unsolved at the political level.

Keywords: *Secondary education, High level sport, Models of Compatibility, School projects for athletes, Club involvement in studies.*

1. Introduction

A swimmer of high-level (podium in Spain Championship), studying the last course before entering the University, enrolled in a school with project for athletes, gets up at 5 in the morning and return home at 8 pm in the evening. During these 15 hours away from home and demanding activity continued, the athlete (and his family) deposited their aspirations and their hopes in two institutions: the school and the sports club.

Legislation highlights three models of combining secondary education with high level sport:

- a) The non-integrated model maintains separate school and sport social relations as two unconnected areas. It involves a lot of personal and family effort for keeping both activities in high-performance, being also the most widespread model. Institutional aid (recognition of subjects, reservation of place) are reserved to students with official sports recognition.
- b) Model not integrated with project for athletes, which preserves the non-integrated model, but the school develops an adapted curriculum with the support of educational administration. In the public system include centers with special attention to sports, although there are private schools with sports projects too.
- c) Integrated model is based in locating to the same centre academic and sport activity. It pushes the student of the local environment and homogenizing their social experiences. In the public system include high performance centres; privately, there are some high-level sports clubs that make up the educational system in operation. The integrated model has clear references also in specific academic measures to music and dance (schools integrated music and dance).

2. Objective

The aim of the article is to understand the compatibility of studies and sports in secondary education in the model with project and the integrated model, also evaluating the involvement of clubs. The real social implication of the study is to improve the effectiveness of educational models for athletes.

3. Method

Involving four directors of centers that offer to combine studies with sports, both private and public education: two representative of model not integrated with project and two representative of the integrated model. Also met the educational inspection, which must ensure the quality of the proposals (n = 5). The sample is complemented by interviews to five technical directors of a team sport (basketball) and four technical directors of clubs in an individual sport (swimming), with very distinct requirements (n = 9). All the clubs represented are high-level sports in each specialty and with categories of training corresponding secondary education.

From a qualitative and descriptive approach, data were extracted through interviews to understand the proposals for institutional support for student-athletes and operation of clubs thereon (Hernández, Fernández and Baptista, 2004). According to perceptions of educational directors, sports coaches and student athletes with the completed secondary stage (committee of experts), the scripts of two semi-structured interviews were built to gather the opinions of professionals. Both interviews consisted of eight questions grouped into three blocks, two on the genesis / structure; four on concrete measures for compatibility studies and sport and finally two above foresight for the future.

4. Discussion

The results show that, although in recent years there has been awareness of the difficulties of young athletes to combine training and studies, educational models are still under development phase, showing common problems of legal support or flexibility of the pedagogical measures applicable.

4.1. Educational Models

The resolutions concerning the organization of public secondary schools, establish two possibilities of compatibility. The first for students already studying in a center project (special attention to sports); the second is aimed at students who do not belong to the first type of centers, and only have the right to curricular flexibility under its official athletic recognition. The other student athletes are excluded

4.2. Center projects for student-athletes

Besides access conditions exposed, the option to find a school with sports project does not guarantee stay in the usual context. Families satisfied with the chosen school, delay this step until both requirements become unsustainable and changing personal project of young sportsman. The academic quality of projects does not diminish any cultural requirement; there is no more unanimous answer among respondents.

4.3. Music and Dance studies

Is recurrent the comparison with the detailed curricular modifications of students who study music or dance simultaneously. The legislative clarity in music and dance should be equitable for athletes. Such hours of dedication that athletes develop without institutional support. The athlete must have marks for scholarship, outcome criterion. However, admission to music and dance is based on a formative test criterion. The differences begin to compare official academic centers with sports clubs without academic recognition.

4.4. Trainings, daily trips and competitions

Training hours increase with age, in parallel to the increase in academic complexity. Daily trips of many young athletes remaining hours to the study and add fatigue. In addition, the sports and academic calendars are incompatible. Students spend the months of April, May and June immersed in the final stages of the regional and Spain Championships, and even international competitions. High level competitions that coincide with University access examinations.

5. Conclusions

Education strives to combine studies and sport, but the clubs do not work at the same level. Sport programs its competitions without regard to the academic calendar. A good project is based on mentor of athletes: an educational leader in the difficult task of combining studies with sports. The mentor of athletes should be especially sensitive to these students and mediate between all the parties: school, club and families. All models recognize that the number of hours they can devote insufficient and that compensation should improve.

References

- Cano, M. (2008). *Com educar avui pel demà? Proposta per un model integral de centre d'innovació educativa*. (Memoria de Investigación, Generalitat de Catalunya: Departament d'Educació). Extraído el 6 de septiembre de 2013 de: http://www.xtec.cat/~mcano/avui_x_dema/index1.html
- Cecić Erpič, S., Wylleman, P. y Zupancic, M. (2004). The effect of athletic and non-athletic factors on the sports career termination process. *Psychology of Sport and Exercise*, 5, 45-59.
- Flanagan, J. y Winther, P. (2004). *Combining sports and education: Support for athletes in the EU member States*. Documento de Trabajo del Parlamento Europeo.
- González, M^a.D. y Bedoya, J. (2008). Después del deporte, ¿qué? Análisis psicológico de la retirada deportiva. *Revista de Psicología del Deporte*, 17 (1), 61-69.
- Hernández, R., Fernández, C. y Baptista, P. (2003). *Metodología de la Investigación*. (3^a ed.). México, McGraw-Hill Interamericana.
- Regüela, S. (2011). *Programa Excel·lència i Transicions (ÈXITS)* (Tesi Doctoral). Departament de Psicologia Bàsica, Evolutiva i de l'Educació, Facultat de Psicologia: UAB. Extraído el 20 de diciembre de 2013 de: <http://www.tdx.cat/browse?value=Reg%C3%BCela+S%C3%A1lez%2C+Susana&type=author>
- Roca, J. (2006). *Automotivación*. (1^a ed.). Barcelona, Paidotribo.
- Solà, J. (2010). Academic Rigor and Dedication to Competitive Sport in Young People 12-18 Years: Major Social Issues. *Physical Culture and Sports Studies and Research*, Vol. L, 100-109.
- Solà, J. (2010). *El fràgil equilibri entre l'exigència acadèmica i la dedicació a l'entrenament de l'esport de competició en joves de 12 - 18*. Extraído el 25 de noviembre de 2013 de: <http://www.fundacioernestlluch.org/ca/publicacio/el-fragil-equilibri-entre-l-exigencia-academica-i-la-dedicacio-a-l-entrenament-de-l-esport-de-competicio-en-joves-de-12-18>
- Singh, A., Uijtewilligen, L., Twisk, J.W.R., Van Mechelen, W. y Chinapaw, M.J.M. (2012). Physical Activity and Performance at School. A Systematic Review of the Literature Including a Methodological Quality Assessment. *Archives of Pediatrics & Adolescent Medicine*, 166 (1), 49-55.
- Stambulova, N. (2000). Athletes' crises: A developmental perspective. *International Journal of Sport Psychology*, 31, 584-601.
- Surís, J.C. y Parera, N. (2005). Don't stop, don't stop: physical activity and adolescence. *International Journal of Adolescent Medicine and Health*, 17 (1), 67-78.
- Taras, H. (2005). Physical Activity and Student Performance at School. *Journal of School Health*, 75 (6), 214-218.
- Vilanova, A., y Puig, N. (2013). Compaginar la carrera deportiva con la carrera académica para la futura inserción laboral: ¿Una cuestión de estrategia?. *Revista de Psicología del Deporte* 22 (1), 61-68
- Wylleman, P. y Lavallee, D. (2004). A developmental perspective on transitions faced by athletes. A M. Weiss (Ed.), *Developmental sport and exercise psychology: A lifespan perspective* (507-527). Morgantown, WV: Fitness Information Technology.

A COMPARISON OF THE EFFECTIVENESS OF THE CAPSULAR AND HEURISTIC MODELS FOR DEVELOPING IN-SERVICE TEACHERS' PEDAGOGICAL CONTENT KNOWLEDGE FOR NATURE OF SCIENCE

Elaosi Vhurumuku

University of Witwatersrand School of Education, Marang Centre, P.B. 2050, Wits, Bag 3, Parktown, Johannesburg (South Africa)

Abstract

This paper reports the results of a quasi -experimental study that compares the effectiveness of the capsular and heuristic models for developing in-service teachers' pedagogical content knowledge for teaching nature of science (PCKNOS). In the capsular approach a group of in-service teachers (n= 15) was first taught elements of the history of science, the philosophy of science, the sociology of science, aspects about scientific literacy and then introduced to aspects of the nature of science and how to teach about NOS and NOSI. The heuristic model involves teaching a group of in-service teachers (n= 11) about aspects of the nature of science and how to teach about of NOS and NOSI. Quantitative and qualitative data on in-service teachers' understandings of NOS and NOSI and their abilities to craft pedagogical strategies for teaching Grade 11 learners about selected aspect of NOS and NOSI as part of Physical Science content was collected using questionnaires in a pre- post test design, involving the two groups. Analysis of the findings and comparisons, suggest that the capsular model is more effective than the heuristic model for developing in-service teachers' PCKNOS –their understandings of both the NOS and NOSI and abilities to craft pedagogical strategies for teaching of NOS and NOSI. Issues and implications for developing in-service teacher education curricula are raised and discussed.

Keywords: *Capsular, heuristic, pedagogical content knowledge, teaching, nature of science*

1. Introduction

The development of teachers' pedagogical content knowledge for teaching nature of science (PCKNOS) has been receiving much research interest and focus from science education researchers during the last ten years (Vhurumuku, Dudu and Sighn, 2015). The nature of science (NOS) refers to the ideas , beliefs, perceptions and values about scientific knowledge and the processes through which it is developed and validated (Vhurumuku and Mokeleche, 2009). There appears to be consensus that the development of teachers understandings of the NOS and teachers abilities to teach about the NOS and the nature of scientific inquiry (NOSI) can go a long way towards promoting scientific literacy as a goal of science education. While this is so, Hanuscin, Lee, and Akerson (2011) point out that a lot still needs to be known regarding the sources, nature, and development of teachers' pedagogical content knowledge (PCK) for teaching NOS. Drawing from the works of Bruner's influential work on *cognitive psychology*, Ausubel's *Assimilation Theory of Cognitive Learning* and Shulman's (1986) work on *pedagogical content knowledge* (PCK), Bartos and Lederman (2014) examine what they call teacher knowledge structures for nature of science (NOS) and scientific inquiry (SI) and how these are communicated in teacher classroom practices. Subject knowledge structures are about the teacher's knowledge of discipline knowledge and abilities to restructure that knowledge and present it in a purposeful, creative, comprehensive, open and dynamic manner (Tsui, 2009, Chi, 1978), so as to make it meaningful and comprehensible to learners. While there appears to be agreement that for teachers to teach learners effectively about the nature of science (NOS) and scientific inquiry (SI), they themselves must have a comprehensive understanding of these constructs; research to date has failed to address the issue of how effectively that knowledge might be developed in teachers in order to develop appropriate knowledge structures and abilities to teach.

The knowledge structure of a teacher and that which is essential for effective classroom practice comprises of a matrix of components including subject matter knowledge, professional knowledge, cultural, historical, philosophical, psychological, sociological and practical knowledge (Novak & Canas, 2007; Chi , 1978), from which appropriate disciplinary wisdom, knowledge and technical knowhow might be distilled and crafted for presentation to learners. Additionally, the teachers own experiences in

learning the subject to be delivered consciously or unconsciously bears upon the teacher's mastery and presentation of the subject matter to learners (Vhurumuku, Dudu and Sighn, 2015). This is irrespective of the disciplinary knowledge required, whether it is about chemical equilibrium in Chemistry, waves in Physics, genetics in Biology or about the nature of science (NOS) and scientific inquiry (SI). It is widely accepted that the manner in which teachers are prepared greatly influence both their subject knowledge mastery and abilities to deliver in the classrooms (see for example, Darling-Hammond, Chung & Frelow, 2002; Laczko-Kerr & Berliner, 2002; Darling-Hammond & Youngs, 2002). In addition to determining teacher abilities to produce sound teaching plans for NOS and NOSI the two programmes specifically aimed to develop teacher knowledge of the following tenets as described by Bartos and Lederman (2014, pp 1153-1154). Specifically the study was guided by the following research questions: (i) To what extent was the capsular model of development more effective than the heuristic approach in terms of teacher subject matter knowledge understandings of the nature of science (NOS) and the nature of scientific inquiry (NOSI)? (ii) To what extent was one model better than the other in terms of teacher abilities to produce sound teaching plans for teaching learners about the NOS and the NOSI, as part of teaching Physical Science content at the Grade 11 level of the South African Physical Science curriculum? Tenets of the NOS and NOSI are ideas about scientific knowledge and the processes of its development and validation which are generally held to be true by the science education community (Vhurumuku, 2010).

2. Conceptual design

Deriving from the work of Duschl (2000), Duschl & Grandy (2008, 2012) and Van Dijk, (2014), the capsular model is based on the premises that in order for teachers to teach NOS and NOSI effectively they also require substantive knowledge base of the history, philosophy, psychology and sociology of science; aspects of scientific literacy as well as the practice of science as a form of inquiry. When following this model teachers do a module during which they are taught about aspects of the philosophies of Thomas Kuhn, Karl Popper, Imre Lakatos and Paul Feyerabend. Additionally various philosophies of science ranging from objectivist to constructivist are explored. They have lectures on the history of science- with major focus on development of atomic theory. As apart of the module they were required to do readings on the philosophers and the history of science including the development of atomic theory. An assignment is given requiring them to reflect on philosophical and historical aspects of science. Additionally, they are given lectures on what scientific literacy is and why it is an important goal for science education, required to read readings on the history of science education and papers on scientific literacy including by Deboer (2000) and Laughksck (2000) and given an assignment based on these aspects. Lastly they are taught about NOS and NOSI tenets and given an assignment which includes preparing a lesson for teaching learners about a selected aspect of the NOS and the NOSI, at the Grade 11 level of the South African Physical science curriculum. As part of this they were asked to describe, explain, illustrate and justify how their teaching plan would explicitly bring about learners' understanding of selected aspects as well as assess learners' understandings.

The heuristic model is based on the characterization of NOS and NOSI as a reference to domain general heuristic consensus based principles following what has been called the 'Lederman programme'. For this model the in-service teachers are taught about the NOS and NOSI tenets (see below) and required to do some readings on research on these aspects and do two assignments requiring them to select and reflect on two myths of science based on *William McComas (1996), Ten myths of science: Re-examining what we think we know*. Basically, the assignments test their understandings of the NOS and NOSI aspects and how they would remediate learner misconceptions around selected myths. They were also required to read papers written from the Lederman programme (e.g. Lederman, 1992; Lederman & Ziedler, 1987). As noted, the focus of the programme and teaching is about developing in-service teachers' understandings of heuristic aspects of the NOS and NOSI, without explicitly exposing them to the history and philosophy of science as is done with the capsular model. However, they are also given an assignment, which requires them to prepare a lesson for teaching learners about a selected aspect of the NOS and the NOSI at the Grade 11 level of the South African Physical science curriculum; and to describe, explain, illustrate and justify how their teaching plan would explicitly bring about learners' understanding of selected aspects as well as assess learners' understandings.

3. Methods

This study used non-equivalent groups, pretest-posttest design (Campbell, & Stanley, 1966). Both groups completed two pre tests (questionnaires), namely, one measuring their understandings or beliefs about the nature of scientific knowledge and nature of scientific inquiry (Aldridge, Taylor and Chen, 1997) and The Views About Scientific Inquiry (VASI) (see, Lederman, Lederman, Bartos, Bartels,

Meyer & Schwartz, 2014; Gaigher, Lederman & Lederman, 2014) at the beginning and at the end of the programmes each running for seven weeks for each of the groups. At the end of each of the programmes the qualities of lesson plans developed to teach the selected aspect (s) on teaching NOS and on teaching NOSI were evaluated, using a rubric.

The group (n =15) who participated in the capsular based programme, were first year students studying for a Bachelor of Science Education (Honours) degree, specializing in Physical Sciences. Nine of the participants were female and 6 were male. All 15 students were in-service teachers who had had at least two years of teaching Physical Science at the Grades 10-12 level of the South African Physical science curriculum. All the participants had never done anything on NOS and NOSI before and their qualifications were as follows: B.Sc. + PGCE = 5. B. Ed, = 10. They had all taken Physical Science as their content major at first degree level. The group (n =11) who participated in the heuristic model based programme, were second year students studying for a Post Graduate Certificate in Education (PGCE) to be, specialized Physical Science teachers at the Grades 10-12 level of the South African Physical science curriculum. All of them had at least one year experience of teaching at the Grades 10-12 level of the South African Physical science curriculum. Six were females and 5 were males. All the participants had never done anything on NOS and NOSI before. All held a B. Sc. degrees majoring in Physical Sciences.

For understandings or beliefs about the nature of scientific knowledge and nature of scientific inquiry questionnaire, pre-service teachers' responses were scored (with reverse scoring were appropriate) on the five-point Likert-type frequency response scale following the procedure used by (Aldridge, Taylor and Chen, 1997). In our case a higher score (>70% of the total score on the ten items on each subscale category) represents constructivist view or understanding of NOS or NOSI and a lower score a positivist or objectivist understanding. The two subscale categories are certainty of scientific knowledge (NOS) and process of scientific inquiry (NOSI). For each group results are only shown here for those who were constructivist, in the pre and post test computed as a percentage of pre-service teachers. For the VASI, responses were analyzed to give an indication on whether the pre-service teachers gave an informed, mixed or naive understanding of the eight aspects of inquiry adequate or in adequate answer on each of the eight items listed above as done by Gaigher, Lederman and Lederman (2014). For this paper only percentage shift for pre-service teachers who had informed understandings from the pre to the post-test is shown for the two groups, since our interest was in comparing the effectiveness of the models. The pre-service teachers' plans were assessed using a rubric designed according to selected aspects from Duschl and Grandy (2012) and constructivist reflection oriented teaching approaches. For example the following criteria were included in the rubric: was the teaching plan based on explicit rather than implicit approaches?; did the plan couple NOS and/or NOSI teaching with Physical Science content; and was there planning for explicit assessment of learners NOS and/or NOSI understandings.

4. Results and discussion

Figure 1 shows a comparison of capsular model and heuristic approach in terms of teacher subject matter knowledge understandings of the nature of science (NOS) at the beginning and end of each programme. As can be seen the two groups were reasonably homogeneous with respect to their views about NOS at the beginning of each of the programmes. In figure terms this translates to shifts from 7 to 14 for the capsular group and from 5 to 8 for the heuristic group. Figure 2 shows a comparison of capsular model and heuristic approach in terms of in-service teacher understandings of the nature of scientific inquiry (NOSI) at the beginning and end of each programme. As was the case with NOS the two groups were reasonably homogeneous with respect to their views about NOSI at the beginning of each of the programmes. In figure terms this translates to shifts from 8 to 13 for the capsular group and from 6 to 9 for the heuristic group. However, the shift here is not as marked as with the NOS subscale. Overall, the results show that the capsular model was more effective in shifting the pre-service teachers ideas in the capsular group compared to the heuristic group

Figure 1. Shift in pre-service teachers' NOS ideas from objectivist to constructivist pre to post test

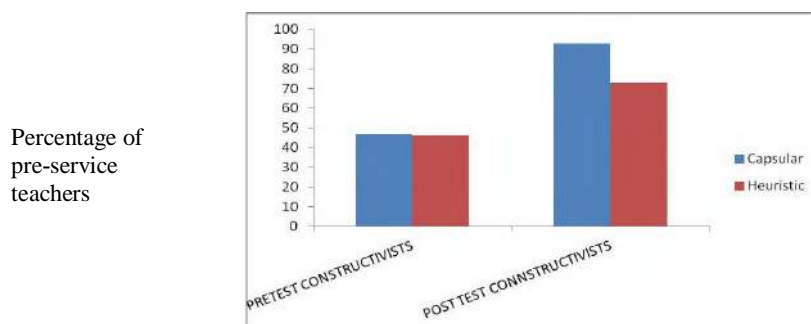


Figure 2. Shift in pre-service teachers' NOSI ideas from objectivist to constructivist pre to post test

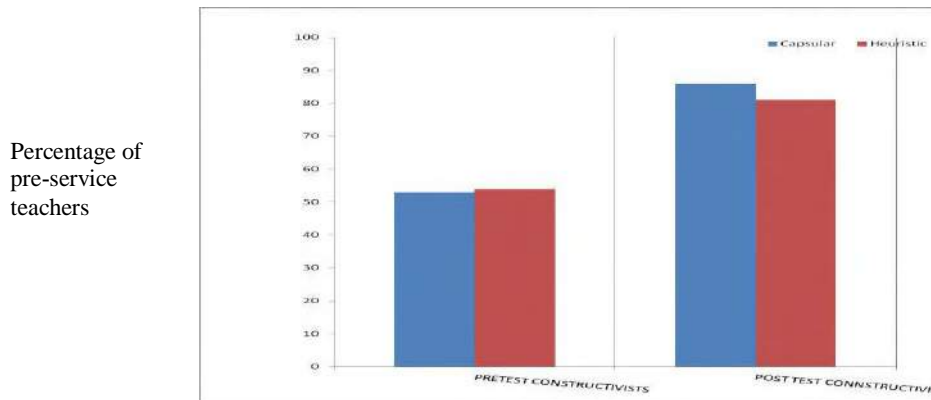


Figure 3. Plot of shifts (%) from pre test to post test for the two groups Capsular and heuristic

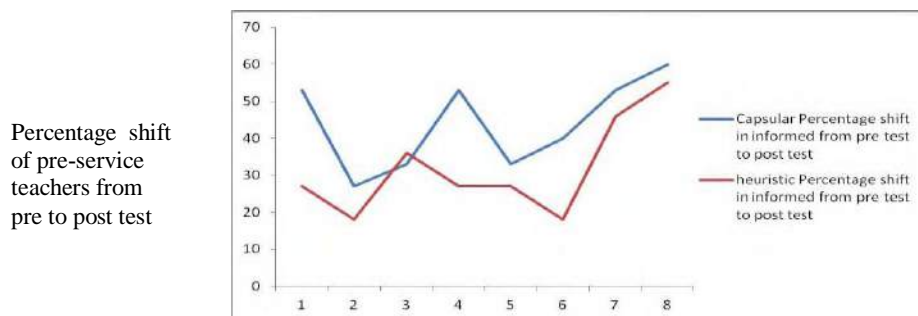


Figure 3 clearly shows that as far as the VASI is concerned the capsular model was more effective compared to the heuristic model in changing preservice teachers ideas between the pre and the post test-for seven of the eight aspects of NOSI given above. Overall, our findings were that a the qualities of teaching plans produced by pre-service teachers in the capsular programme were much higher than those produced by teachers under the heuristic programme. For example almost all the teachers (13) from the capsular programme produced plans that used history of science approaches to and promoted of core discourses of science -e.g., talk/argument, models/representations; critique and communication. Only 3 of the 11 teachers under the heuristic programme produced such teaching plans.

5. Conclusions

Overall the results suggest that the capsular model is more effective than the heuristic model for developing in-service teachers' PCKNOS –their SMK understandings of both the NOS and NOSI and abilities to craft pedagogical strategies for teaching. This supports suggestions by of Duschl (2000), Duschl & Grandy (2008) and Van Dijk, (2014), who argue that in order for teachers to teach about NOS and NOSI effectively, they require substantive knowledge base of the history, philosophy, psychology and sociology of science; aspects of scientific literacy as well as the practice of science as a form of inquiry. It is possible that teachers who are exposed to these aspects develop much deeper knowledge and more organized knowledge structures for nature of science (NOS) and scientific inquiry (SI) (Bartos & Lederman, 2014) and are thus more capable to craft better and sound pedagogical strategies for teaching.

Thus, for purposes of preparing teachers to teach about NOS and NOSI, it is necessary that science teacher trainers in universities and teachers colleges when preparing teachers for achievement of the goals of science education for scientific literacy to approach content preparation following a layered capsule, with the history, philosophy, psychology and sociology of science forming the periphery, moving deeper into inner layers of subject matter knowledge for scientific literacy (SMKSL) and NOSI/NOS heuristics. This approach followed by introduction to pedagogical strategies for teaching these aspects could be more effective compared to simply teaching the NOS and NOSI aspects as heuristics to be passed on to the learners. The teacher training experience from the current study point towards teacher gains in both *substantive* and *syntactic* SMKNOS and SMKNOSI following the disciplinary approach of the capsular model.

References

- Aldridge, J., Taylor, P.C., & Chen, C. (1997). *Development, validation and use of the Beliefs About Science and School Science Questionnaire (BASSSQ)*. Paper presented at the annual meeting of the National Association for Research in Science Teaching (NARST)
- Bartos, S. A. & Lederman, N. G. (2014). Teachers' Knowledge Structures for Nature of Science and Scientific Inquiry: Conceptions and Classroom Practice, *Journal of Research in Science Teaching*, 51(9), 1150–1184.
- Campbell, D.T. & Stanley, J.C. (1966). *Experimental and quasi-experimental designs for research*. Chicago: Rand McNally College Pub. Co.
- Chi, M. T. H. (1978). Knowledge structures and memory development. In R. S. Siegler (Ed.), *Children's thinking: What develops?* Hillsdale, NJ: Erlbaum.
- Darling-Hammond, L., Chung, R., & Frelow, F. (2002). Variation on teacher preparation: How well do different pathways prepare teachers to teach? *Journal of Teacher Education*, 53, 286–302.
- Darling-Hammond, L., & Youngs, P. (2002). Defining “highly qualified teachers”: What does “scientifically-based research” actually tell us? *Educational Researcher*, 31(9), 13–25.
- Duschl, R. A. (2000). Making the nature of science explicit. In R. Millar, J. Leach & J. Osborne (Eds.), *Improving Science Education: The contribution of research* (pp. 187–206). Philadelphia: Open University Press.
- Duschl, R., & Grandy, R. (Eds.). (2008). *Teaching Scientific Inquiry: Recommendations for Research and Implementation*. Rotterdam, Netherlands: Sense Publishers.
- Duschl, R.A. & Grandy, R. (2012). Two Views About Explicitly Teaching Nature of Science. *Science & Education*. DOI 10.1007/s11191-012-9539-4.
- Gaigher, E., Lederman, N & Lederman, J. (2014) Knowledge about Inquiry: A study in South African high schools, *International Journal of Science Education*, 36:18,3125-3147, DOI:10.1080/09500693.2014.954156
- Hanuscin, D.L., Lee, M. H., & Akerson, V.L. (2011). Elementary Teachers Pedagogical Content Knowledge for Teaching the Nature of Science. *Science Education*, 95(1), 145–167.
- Laczko-Kerr, I., & Berliner, D.C. (2002). The effectiveness of “Teach for America” and other under-certified teachers on student academic achievement: A case of harmful public policy. *Education Policy Analysis Archives*, 10 (37) Retrieved on March 1, 2006, from: <http://epaa.asu.edu/epaa/v10n37/>.
- Laugsch, K.C. (2000). Scientific literacy: A Conceptual Overview, *Science Education*, 84, 71-94.
- Lederman, N. G. (1992). Students and teachers conceptions of the nature of science: A Review of Literature. *Journal of Research in Science Teaching*, 29: 331-359.
- Lederman, J. S., Lederman, N. G., Bartos, S. A., Bartels, S. A., Antink Meyer, A. & Schwartz, R. (2014). Meaningful assessment of learners' understandings about scientific inquiry-The views about scientific inquiry (VASI) questionnaire. *Journal of Research in Science Teaching*, 51(1), 65–83.
- Lederman, N.G., & Ziedler, D.L. (1987). Science teachers' conceptions of the nature of science: Do they really influence teacher behaviour? *Science Education*, 74: 225-239.
- McComas, W.F.(1996). Ten Myths of Science; Reexamining What We Think We Know About the Nature of Science: *School Science and Mathematics*, 96, 10-16.
- Novak, J.D. & Canas, A.J. (2007) Theoretical origins of concept maps, how to construct them and uses in education. *Reflecting Education*, 3(1): 29 – 42.
- Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15, 4-14.
- Tsui, A.B.M. (2009). Distinctive qualities of expert teachers. *Teachers and Teaching: theory and practice*, 12(4): 421 – 439.
- Van Dijk, E. (2014). Understanding the Heterogeneous Nature of Science: A Comprehensive Notion of PCK for Scientific Literacy. *Science Education*, 98, 3, 397–411.
- Vhurumuku, E. (2010). The impact of explicit instruction on undergraduate students' understandings of the nature of science. *African Journal of Research in MST Education*, Volume 14 (1), 99–111.
- Vhurumuku, E., Dudu, W.T, Singh, S. (2015). Pedagogical content knowledge for nature of science: in search for a meaning for the construct, Proceedings of the Twentieth Third Annual Meeting of the Southern African Association of Research in Mathematics and Science Technology Education (SAARMSTE) Conference hosted by Eduardo Mondlane University, Maputo, Mozambique, 13th-18th January, 2015 (Short Paper)
- Vhurumuku, E, & Mokeleche, M. (2009). The nature of science and indigenous knowledge systems in South Africa, 2000-2007; a critical review of the research in science education. *African Journal of Research in Mathematics, Science and Technology, Special Issue*, 1, 96-114.

A CASE STUDY: EXPLORING CHILDREN'S UNDERSTANDING OF DEATH AND THEIR ATTITUDE TOWARDS LIFE WITH PICTURE BOOKS

Ran Lee & Eunja Hyun

Department of Child Psychology & Education, SungKyunKwan University (Republic of Korea)

Abstract

The purpose of this study is to explore children's understanding of death and their attitude change towards life after reading books dealing with death. As a result, there was a reflection of their religious assumption. The participants interpreted the stories based on their belief systems. If the stories did not match with their assumption, they used another strategy in order to interpret those stories. Also, it is shown that they recalled death-related memories and applied those stories to their own loss experiences and social events. Furthermore, they recognized the importance of their own everyday life rather than the immersion in death itself after reading stories. It means that death-related stories help the participants express their passion towards life and resolve to live their lives to the utmost.

Contrary to their first drawings before reading books, their second drawings after reading books contained the joy of living and reflected the understanding of death they developed while reading books. Also, the colors they had used in their second drawings were brighter than the previous ones. Their passionate attitude towards life above was equally shown in their writings as well.

In conclusion, reading death stories in picture books turned out to be a process in which children develop and reflect on their understanding of death. Abundant opportunities to express their own feelings are offered and children closely connect the books' contents with every day real life or social events. Furthermore, death stories can help the children love their lives and provide a strong will for living sincerely.

Keywords: *case study, understanding on death, reading picture books, attitude change towards life, emotional expression.*

1. Introduction

Understanding death is a difficult challenge for children due to the fact that it is not a simple notion. In fact, understanding death is related with variety of facets such as social and cultural beliefs, personal and emotional issues, religious assumptions and conceptual understandings(Slaughter, 2005). Research on children's conceptions of death has primarily explored the degree of similarity between the death concepts of adults and children(Kenyon, 2001). Speece and Brent(1996), through vast literature review, concluded that there are four principal subconcepts concerned with children's concept of death: irreversibility, finality or non-functionality, causality, and inevitability.

Another body of research has studied relationships between children's concepts of death and variables as age, gender, developmental level, socioeconomic status of the family, religious beliefs and previous experience with death(Kane, 1979; Speece & Brent, 1984; Wass, 1991). Among them, cognitive maturity and age on the comprehension of death is the most influential element(Mahon, Goldberg and Washington, 1999). Speece and Brent(1984) proposed that a full understanding including the indigestible death components such as causality can be achieved on about 10 years of age.

The necessity of death education is evident in that children can understand death in more scientific way and adjust to their real world without death anxiety(Slaughter, Griffiths, 2007). Furthermore, children who have heard about death story and acquired the death concepts can escape from their grief confronting the real loss experience and recover to normal life in more smooth way(Ward, 1993; Westmoreland, 1996). Especially, Crase(1982) emphasized that the aims of death education is to encourage children to have a sensibility for life and to internalize the importance of living.

Based on those theoretical foundations, this study explored the understandings on death among four children aged 10 through a reading program mainly consisting of 4 times picture book reading sessions and discussion sessions.

2. Method

2.1. Participants

Participants are four elementary students aged 10: one girl, three boys. Their demographic information is shown in table 1. They all have a loss experience, mainly grandparent loss. Among them, two participants have a religion, Christianity. They are all living in a small town, Kyunggy-do in Republic of Korea.

Table 1. Participants' demographic information

Child	Girl/boy	Age	Nationality, Area	Loss experience	Religion
Child 1	girl	10	Korea, Kyunggydo	yes (grandparent, pet)	none
Child 2	boy	10	Korea, Kyunggydo	yes (grandparent)	Christianity
Child 3	boy	10	Korea, Kyunggydo	yes (grandparent)	Christianity
Child 4	boy	10	Korea, Kyunggydo	yes (grandparent, cousin)	none

2.2. Instruments

The reason why this study chose the five books shown in table 2 was those books reflect different viewpoints on death (Lee & Hyun, 2014). <Old pig> and <Scar> show the atomistic perspective while <The grand father became a ghost> and <Red cheeks> reflect immortal viewpoint on death. <What's Heaven> represents a belief on afterlife.

Table 2. Picture book materials

Title	Author	Published year	Publisher
Old Pig	Margaret Wild/ Ron Brooks	1999	Allen & Unwin Inc.
Scar	Charlotte Moundlic/ Olivier Tallec	2011	Candlewick
Then Grandfather Became a Ghost	Kim Fupz Aakeson/ Eva Eriksson	2000	Gyldendal
Red Cheeks	Heinz Janisch /Aljoscha Blau	2006	Loguez Ediciones
What's Heaven	Maria Shriver /Sandra Speidel	2007	Golden Books Adult Publishing

2.3. Procedure

The participants gathered in a researcher's house four times at 4th, 11th, 18th and 25th October, 2014 and each reading program took about 1 hour. At the beginning of program in the first meeting, they were required to answer death definition: that is, they completed a sentence beginning with 'death is.' Secondly they initially drew a picture on what they think about death. And they read <Old pig> altogether and discussed about what they would do one day before their own death.

In the second meeting, the participants read total 3 books, <Scar>, <Then grandfather became a ghost>, <Red cheeks>, and discussed their understandings on death based on those picture book contents.

In the third meeting, the participants read <What's heaven> and discussed their understandings on its contents. Each participant completed a poem on death.

In the final meeting, they finally drew a picture on death again and discussed the feeling and reflection on the program the participants had been performing.

Through these activities, this study explored their ideas and the attitude shifts on death in three domains: cognitive, affective, and social domains.

3. Results

3.1. Cognitive domain: Reflection of belief assumption

Religious beliefs are a key agent in interpreting death. The participants were interpreting the picture books' contents according to their own understandings of death and an afterlife. Believers tend to express that death is not a painful event in that they would rise again from the dead whereas the non-believers could not understand the existence of heaven in reading 00. "It's not real. The author created a false story." The non-believers preferred rather 'Scar' because it reveals death concepts such as irreversibility and finality. "I think Scar is more realistic."

When the participants met the ghost grandfathers wandering around the child characters in books,

both believers and non-believers accepted these stories based on a critical frame in which the reader usually evaluates stories in terms of the literary effects. "I think this was made in order to console readers who are in sorrow from a loss. If I'm right, it can be useful for them." In other words, when they read books that reflect various viewpoints on death, they use both referential and critical frames in their interpretations, which Liebes had suggested, flexibly adapting the content to participants' belief assumptions.

In sum, it is shown that they definitely interpreted the contents and judged the truthfulness of the contents according to their own belief system. If the picture book contents did not match with their assumption, they used some reading strategies to make the story not conflict with their belief systems.

3.2. Social Domain: Application to loss experience and social events

Children's previous experience affects their interpretation of death (Wass, 1991). All the participants in this study had more than one loss experience including their grandparent's death. At first, nevertheless, their understanding on death was superficial as shown in table 3.

Table 3

Participants	Sentences made by participants
Child 1	Death is not a fun. It is sad.
Child 2	Death is not what I want. Maybe my parents first.
Child 3	Death is to enter heaven.
Child 4	Death is to disappear all at once. It means the end.

After reading those death-related books, participants expressed their own emotions more freely. To express their emotions helps the children recover to normal life when they have experienced or were facing loss events. Their hidden past experience concerned with death can come out with their free emotional expression while reading and discussing those books. "I was afraid that I would lose my mom as well. My wish is that my mom and I would die on the same day. I know how the character feels in this story."

Also, they interpreted those contents based on their own loss experience. "I think the character wants to be with his grandfather constantly even though he died. So, he feels his grandfather is with him. I have had a similar experience. I dreamed about my grandmother. I miss her."

The participants discussed not only their private loss experience but also social events related to death. Their statements revealed that the participants were connecting the story contents with social events like the Sewolho accident, a ferry that sank in Korea last year. They recalled and interpreted the real event based on the story contents they just read. "I did not know what it was. But, now I know. My mom and dad cried and shouted like the child in 'Scar' even though the kids who died in the ship were not my parents' children."

3.3. Affective domain: Passion and resolution to live lives to the utmost

After reading those books, the participants' felt passion for life and expressed their aspiration for living their lives to the utmost. Even though death education deals with death itself, it helps children to develop a sensibility towards life and encourages them to live their lives with sincerity. Also, the participants' understanding of death became richer than before reading books.

Figure 1. Participants' first drawings before reading books (Child1 – Child 4 in order)



Figure 2. Participants' last drawings after reading books (Child1 – Child 4 in order)



Before reading books, their drawings on death were too superficial and they had a startling likeness to one another in that there was a dead in the ground and his soul were ascending to the sky. In the sky, there were angels and evils separately. However, after reading books, a variety of details were added in their drawings such as hospitals, aliens, growth of a boy and crossroads of life and dead. Also, the colors that they used were brighter than before. A child appearing in a participant's drawing was saying "It is just as well that I am alive."

Furthermore, their poems show that their attitudes towards life were changed positively. Their sentences they had made in the first meeting, their ideas on death were too superficial and not concerned with life itself. However, in the last meeting, The participants' expression words about living and death were abundant in their writings and one of their concerns was on life as well as on afterlife.

Table 4. Poems made by participants after reading

Participants	Poems made by participants
Child 1	Living in this world means joy to others Being dead means sadness to others Cry aloud, you would be comfortable now.
Child 2	Life means that I live. Death means that I am dead. I know where I would go after death. But, I am wondering if I can go there.
Child 3	If living, don't remove scab from the knee Mom is living. Probably in that world. Believe her living. What is important is my life here.
Child 4	Let's go to that world and enjoy our playing. But, we should live for a long time. Let's live long and sincerely. Let's enjoy our lives with all our heart.

4. Discussion and conclusion

This study aims to explore children's understandings of death and their attitude towards life after reading books dealing with death. For this study, four third-graders in elementary schools were examined with some activities such as a sentence completion task, discussion after reading books, drawing and writing tasks.

The result shows that there is a reflection of their religious assumption. They interpreted the stories based on their belief systems; if this did not match with their assumption, they used another strategy in order to accept those stories. Also, they applied the stories to their own loss experiences and social events. Furthermore they recognized the importance of their own life rather than the concerns on death itself after reading stories. It means that they expressed the passion towards life and resolve to live to the utmost.

Contrary to their first drawings before reading books, their second drawings after reading books contained the joy of living and reflected the understanding of death they developed while reading books. Also, the colors they had used in their second drawings were brighter than the previous ones. Their passionate attitude towards life above was equally shown in their writings as well.

In conclusion, reading death stories in picture books turned out to be a process in which children develop and reflect on their understanding of death. Abundant opportunities to express their own feelings are offered and children closely connect the books' contents with every day real life or social events. Furthermore, death stories can help the children love their lives and provide a strong will for living sincerely.

References

- Kane, B. (1979). Children's concept of death. *Journal of Genetic Psychology*, 134, 141-153.
- Kang, H.K. & Kim, S. S.(2013). A literature review on the mourning process of young children. *Journal of Future Early Childhood Education*, 20(2), 325-345
- Kenyon, B.L. (2001). Current research in children's conceptions of death: A critical review. *Omega*, 43, 63-91.
- Liebes, T. & Katz, E.(1993). *The export of meaning*. Oxford : Oxford University Press.
- Mahon, M. M., Goldberg, E. Z., & Washington, S. K. (1999). Concepts of death in a sample of Israeli Kibbutz children. *Death Studies*, 23, 43-59.
- Slaughter, V. (2005). Young children's understanding of death. *Australian Psychologist*, 40, 179-186.
- Slaughter, V., & Griffiths, M. (2007). Death understanding and fear of death in young children. *Clinical Child Psychology and Psychiatry*, 12, 525-535.
- Speece, M. W., & Brent, S. B. (1984). Children's understanding of death: A review of three components of a death concept. *Child Development*, 55, 1671-1686.
- Speece, M. W., & Brent, S. B. (1996). The development of children's understanding of death. In C. A. Corr & D. M. Corr (Eds.), *Handbook of children's death and bereavement*(pp. 29-50). New York, NY: Springer.
- Cruse, D. (1982). Death Education's Quest for maturity. ERIC No. ED214489, 1982, 1-14.
- Ward, B. (1993). *Good grief*. London: Jessica Kingsley Publishers.
- Westmoreland, P. (1996). Coping with death; Helping students grieves. *Childhood Education*, 72(3), 168-190.

SOCIAL MEDIA AS A COMMUNICATION TOOL WITH FAMILIES: A KINDERGARTEN CASE

Fusun Akdag, Ph.D.¹ & Tugba Ozdinc²

¹*Bahcesehir University, Istanbul (Turkey)*

²*Akatlar Kindergarten, Istanbul (Turkey)*

Abstract

Communication with children and their families is essential in early childhood education. Children's learning and development is fostered when communication with parents and family is actively maintained (Ka Hikitia, 2008). Increasingly, families get familiar with technologies such as email, Skype, and social networking sites such as Facebook, Twitter since these are the 'cultural tools' used to keep in touch with extended family and friends (Rogoff 2003). Today's teachers are increasingly turning to digital technologies to make communication with parents easier, faster and more current. Social-media tools, such as Facebook and Twitter, are helping teachers keep parents and other community members informed. Teachers are encouraged to go where the parents are and many parents are already on Facebook, so it is easier to communicate with them on a platform with which they are already familiar. Facebook allows the teachers to share class news and information with the parents of their students. Studies have also demonstrated that parental involvement and engagement with what is being learned in the classroom can have positive effects on a child's learning (Fan & Chen, 2001; Jeynes, 2003).

The aim of this study is to understand the parents' opinions about teachers' use of social media as a communication tool in a kindergarten class. The study group consisted of 52 parents in a public kindergarten in Istanbul. Data was collected with structured interview method. The demographic characteristics showed that parents were mostly working females around 35-40 years of age. According to the results, communicating with parents through social has positive effects on family participation and parents are happy to be involved in school activities.

Keywords: *Preschool education, family participation, social media, communication*

1. Introduction

Early childhood in human life span is defined as the period from birth to eight years old and this period lay the foundation for all that is to come in future years. Early childhood education can play a critical and vital role during this developmental period. The cognitive, emotional, social and physical development of young children has a direct effect on their overall development and on the adult they will become. That is why education of young children is so important to maximize their future well-being (Unesco, 2010).

In the early childhood years, the home– school relationship refers to the formal and informal connections between families and their young children's educational settings. Both participation in preschool based activities and regular communication between families and teachers are related to young children's outcomes (Marcon, 1999).

'The family seems to be the most effective and economical system for fostering and sustaining the child's development. Without family involvement, intervention is likely to be unsuccessful, and what few effects are achieved are likely to disappear once the intervention is discontinued' (Bronfenbrenner, 1974).

Not only do strong home–school relationships matter for children's outcomes during the early childhood years, but the benefits persist over time. For example, family involvement activities such as keeping in touch with a teacher, volunteering in the classroom and attending school activities were related to children's promotion after kindergarten into the first grade (Mantizicopoulos, P., 2003).

The Harvard Family Research Project defines educational involvement of families as activities that parents conduct at home and in early childhood settings to directly or indirectly support their child's learning. Involvement at the preschool level has a number of lifelong benefits, such as establishing the importance of education and developing a network of helpful connections. Establishing a social network is one benefit of parental involvement that should not be underestimated. Kids are apt to become friends with parents who are

on a friendly basis. Social connections between children provide security when transitions, such as elementary school occur. (Kreider, 2002) Studies have also demonstrated that parental involvement and engagement with what is being learned in the classroom can have positive effects on a child's learning (Fan & Chen, 2001; Jaynes, 2003).

Two-way communication between families and kindergarten teachers is the first step toward improving family involvement in education. Children's learning and development is fostered when communication with parents and family is actively maintained (Ka Hikitia, 2008) Although face-to-face conversations may be preferable, the schedules of modern families, and of providers themselves, often make this difficult. To effectively communicate with families, all of the "new" communications channels through which parents can be reached. Increasingly, families get familiar with technologies such as email, Skype, and social networking sites such as Facebook, Twitter since these are the 'cultural tools' used to keep in touch with extended family and friends (Rogoff, 2003; Rideout, 2014).

2. Methodology

This study is a qualitative study to understand the the parents' opinions about the classroom teacher's use of social media as a communication tool in a kindergarten class. The study group consisted of 52 parents in a public kindergarten in Istanbul Data was collected through structured interview method where the questionnaire is developed by the researcher. Basic research questions are:

1. Which technological tools and social media applications are mostly used by the parents?
2. What are the parents' social media preference for involvement in classroom activities ?
3. What are the social media activities parents like most in classroom involvement?
4. What are the effects of social media usage on parents and their children?

3. Results

According to the demographic results, parents of the study group (% 75 are mothers) are mostly university graduates, mostly between age 31-40 and mostly working mothers.

Table 1. Technological tools used by parents (%)

Communication tools	Parents use		Parents do not use		Total	
	f	%	f	%	f	%
Laptop	22	42,3	30	57,7	52	100
Desktop	23	44,2	23	44,2	52	100
Tablet	27	51,9	25	48,1	52	100
Smart phone	47	90,4	5	9,6	52	100

Table 2. Social media programs used by parents (%)

Programs	Parents use		Parents do not use		Total	
	f	%	f	%	f	%
Facebook	51	98,1	1	1,9	52	100
Twitter	23	44,2	29	55,8	52	100
Instagram	24	46,2	28	53,8	52	100
Linkedin	19	36,5	33	63,5	52	100
Vine	1	1,9	51	98,1	52	100
Pinterest	3	5,8	49	94,2	52	100

Table 3. Programs parents prefer to use for classroom participation (%)

Programs	Parents use		Parents do not use		Total	
	f	%	f	%	f	%
Facebook	51	98,1	1	1,9	52	100
Twitter	6	11,5	46	88,5	52	100
Instagram	4	7,7	48	92,3	52	100

Table 4. Social media activities most liked by parents

Activites	N	Average
Photographs of children taken during an in- class activity	52	8,55
Photographs and videos shot by other parents	52	4,69
Videos about the subject of the week	52	6,30
Information sharing about the in-class activities	52	7,94
News about the school/class	52	7,19
Ideas for at home activities	52	5,9
Useful links	52	5,57
Ideas for outdoor activities for family	52	5,67
Recommendations for books, magazines	52	4,5
Other	52	1,21

Table 5. Activities of parents after sharing social media inputs with their children

Activites	f	%
Conversation with my child after looking at photos of in class activities	46	88,5
Watching the videos together	36	69,2
Applying the suggested ideas for activities at home	30	57,7
Applying the suggested family outdoor activities	25	48,1
Studying the subject of the day/ week of curriculum	26	50
Getting the recommended books, magazines and reading them together	35	67,3
Other	2	3,8

To summarize the results of this study, one important effect of using social media in family involvement is to reinforce classroom learning for extended benefit. Another important effect is on the social aspect of the family. When parents spend time with their children reviewing their school activities, they learn more about their children's capabilities, skills and knowledge and share quality time together to strengthen the parent-child connection. The parents involved in the study were pleased with the applications of social media. This study is a pilot study and further research is needed to expand the research questions.

References

- Bronfenbrenner, U. (1974). Is early intervention effective? *Teachers College Record*, 76(2), 279–303.
- Fan, X., & Chen, M. (2001). Parental involvement and students' academic achievement: A meta-analysis. *Educational Psychology Review*, 13(1), 1–22.
- Jeynes, W. H. (2003). "A meta-analysis: The effects of parental involvement on minority children's academic achievement," *Education and Urban Society*, Vol. 35, No. 2, 2003, pp. 202–218.
- Kreider, H. (2002) *Family Involvement Network of Educators (FINE) Harvard Family Research Project* Retrieved from Website: www.hfrp.org
- Mantizicopoulos, P. (2003). Flunking kindergarten after Head Start: An inquiry into the contribution of contextual and individual variables. *Journal of Educational Psychology*, 95(2), 268–278.
- Marcon, R. (1999). Positive relationships between parent school involvement and public school inner-city preschoolers' development and academic performance. *School Psychology Review*, 28(3), 395–412
- Ministry of Education (2008). *Ka Hikitia. Managing for success: Maori Education Strategy 2008-2012*, Wellington
- Rideout, V. (2014). *Learning at home: Families' educational media use in America*, New York, N.Y.: The Joan Ganz Cooney Center at Sesame Workshop
- Rogoff, B. (2003). *The Cultural nature of human development*. New York: Oxford University Press.

TEACHERS: THE KEYSTONE OF SOCIAL AND EMOTIONAL LEARNING PROGRAM EFFECTIVENESS

Raquel Palomera, Elena Briones & M^a Angeles Melero

Department of Education, University of Cantabria (Spain)

Abstract

During the last decades many Social and Emotional Learning (SEL) school programs have been developed, but only some have been validated. In this work we carried out a quasi-experimental study with pretest baseline and a 2 years-posttest with the objective to assess the impact of a SEL program (*Educación Responsable*) on children's social and emotional development and psychosocial adjustment. The program is implemented by a trained tutor teacher with a mean of 15 session/ academic year. Sample was composed by four different socio-demographic schools (urban/rural; public/private), which implemented the program (59%), and their respective control ones. A total of 694 children (54% women) from pre-kindergarten (50%) to elementary grades (mean age=7,74), parents and teachers participated. Before the assessment, school, parents and teachers were informed and asked for permission. Also data recollection was volunteer and anonymous. Students of 9 years old filled on their classroom some Emotional Quotient-Inventory subscales (EQ-i; BarOn & Parker, 2000): stress management, intrapersonal and interpersonal abilities and to analyze effects over psycho-social adjustment they answer to certain BASC subscales (Reynolds & Kamphaus, 2004): negative attitude towards school and teachers, withdrawal, anxiety, interpersonal relations and self-esteem; parents from kindergarten students filled same instruments with the parents form subscales; at the same time, teachers informed of all student's competencies and behavior through the teachers version of the same instruments, adding aggression subscale of BASC. In addition, all teachers filled a Strategic Test on Emotional Intelligence (STEI; Fernández-Berrocal et al, 2011) and the teachers of the experimental schools a socio-professional questionnaire about teaching experience, SEL knowledge, commitment with the program and intensity of implementation, as control variables. All measures were reliable. GLM of repeated measures was used to analyze data. Results showed significant results of the program over aggression and withdrawal informed by teachers in elementary grades, and withdrawal on middle students as informed themselves. But more effects were showed after controlling for teacher's control variables, especially for elementary student's development, with significant impact on their interpersonal relationships, anxiety, intrapersonal abilities, aggression and withdrawal; at the same time, adaptability was improved on middle students. These results informed us about the principal influence of teacher abilities and motivation over SEL program effectiveness. We found important implications for pre-service and in-service institutions, which should include SEL training into their curriculum, in order not only to assure the promotion of these competencies on children and teachers through specific validated programs but also to improve, through deep comprehension, the commitment and effectiveness to achieve it.

Note: this research was made under a grant from Fundación Botín.

Keywords: *Social and Emotional Learning, effectiveness, teacher, training, children*

1. Introduction

After decades of research, studies have shown multiple reasons why Social and Emotional Literacy is necessary on education objectives and methods. It has been posited that universal school-based efforts to promote students' SEL represent a promising approach to enhance children's success in school and life (Zins & Elias, 2006). Extensive developmental research indicates that effective mastery of social and emotional competencies is associated with greater well-being and better school performance whereas the failure to achieve competence in these areas can lead to a variety of personal, social, and academic difficulties (Eisenberg, 2006; Guerra & Bradshaw, 2008).

Educación Responsable (Responsible Education; V.V.A.A., n.d.) is an educative program, developed from Fundación Botín, oriented to develop SEL on students of all educative levels into the school context with the collaboration of all educative community. The program is based on a broadly accepted definition of *Social and Emotional Learning* (SEL) developed by the Collaborative for Academic, Social and Emotional Learning (2005) who defined SEL as the process to foster the development of five interrelated sets of cognitive, affective, and behavioral competencies: *Self-awareness*: accurately assessing one's feelings, interests, values, and strengths; maintaining a well-grounded sense of self-confidence; *Self-management*: regulating one's emotions to handle stress, control impulses, and persevere in overcoming obstacles; setting and monitoring progress toward personal and academic goals; expressing emotions appropriately; *Social awareness*: being able to take the perspective of and empathize with others; recognizing and appreciating individual and group similarities and differences; recognizing and using family, school, and community resources; *Relationship skills*: establishing and maintaining healthy and rewarding relationships based on cooperation; resisting inappropriate social pressure; preventing, managing, and resolving interpersonal conflict; seeking help when needed; *Responsible decision-making*: making decisions based on consideration of ethical standards, safety concerns, appropriate social norms, respect for others, and likely consequences of various actions; applying decision-making skills to academic and social situations; contributing to the well-being of one's school and community.

The program meets the criteria of effectiveness required in SEL programs (Durlak et al, 2011): Sequenced programming, Active methodologies, Focused on concrete competencies and Explicit training of the skills. Also, in order to get an effect over children development, each student group received a minimum of 15 one-hour sessions per academic-year (Diekstra, 2008). It requires intensive training and online support of teachers during first three years of implementation. One of the principal innovations is the use of New Technologies (using a diversity of audiovisual stimulus) and the use of Arts (music concerts, art exhibitions, literature) as a means to get SEL.

2. Objectives

The study propose is to validate the Educación Responsable program, which means, to assess the effect of the program over the social and emotional development of the students who are trained during two academic years.

Looking at previous literature, we expect to find significant results on student's emotional and social skills in the training condition, as are defined by SEL framework, respect the control group and pre-test scores. In the same line, is expected to observe indirect effects on psycho-social adjustment.

3. Method

The research was conducted using a quasi-experimental study, that is, a comparison of groups of students who have followed the Responsible Education program (experimental group) with groups of students who have not participated in it (control group) respect their pre-test and post-test scores. Also, control variables such number of implementation's sessions, and teacher's emotional intelligence, experience or program commitment was controlled for analyses.

3.1. Sample

Sample was composed by four schools with different socio-demographic characteristics (urban/rural; public/private), which implemented the program (experimental=59% of sample), and their respective control ones, a further four schools with similar socio-demographic characteristics. A total of 694 children (54% women) from pre-kindergarten (3, 5 years old) to elementary grades (7, 9 years old) with a similar distribution of 25% each age conformed the total sample (experimental and controls conditions). Also their parents (95%) and 79, 8% of the teachers participated in the study.

3.2. Assessment procedure

Pretest assessment were conducted starting the academic year and post-test ending the next one, so 1,7 months later. Before start assessment, local government for education, school head, parents and teachers were informed and asked for permission. Also data recollection from students, teachers and parents was volunteer and anonymous (using codes). Nine-year old elementary school students filled out the self-report questionnaires in their own classroom in the presence of the researcher. At the same time, information about pre-kindergarten and 2º graders students were obtained through parental hetero-informs versions of the same scales, who received the instrument through the tutor into an envelope. Teachers

from all levels filled an Emotional Intelligence Test and a socio-professional questionnaire, but also completed hetero-informs about their students behavior and traits. A teacher-fellow from the research substituted the teachers during four hours of classes while teachers informed about themselves and their students.

3.3. Instruments

We selected well validated instruments with good reliability to get the data.

Emotional Quotient Inventory-Youth Version (EQ-i-YV; Bar-On & Parker, 2000). We used the students, parents and teacher version. The questionnaire consider the top five social and emotional intelligence conceptual components involving 15 factors measured by Bar-on theoretical model of emotional intelligence:

- Intrapersonal (CIA). Area that meets the following factors: emotional self-understanding, assertiveness, self concept, self-realization and independence.
- Interpersonal (CIE). Area that meets the following components: empathy, social responsibility and interpersonal relationship.
- Adaptability (CAD). Area that meets the following components: reality testing, flexibility and problem solving.
- Stress management (CME). Area that meets the following components: stress tolerance and impulse control.
- General Mood (CAG). Area that meets the following components: happiness and optimism.

Behavior Assessment System for Children (BASC; Reynolds & Kamphaus, 2004). The Battery evaluates both positive and negative aspects of development. In this case, we have used the Spanish version and selected the items to assess student's self-esteem, anxiety, interpersonal relationships, and relationships with parents, negative attitude toward teachers and school. Teachers filled the aggression, anxiety, withdrawal and social skills subscales about their students.

As control variables:

Socio-professional data questionnaire: we recollect teachers data of sex, date of birth, years of teaching experience and training received on SEL (hours). Experimental teachers also answered about: interest and commitment with the Educación Responsable Program (through a 7-likert scale where 1= Nothing and 7= A lot).

Strategic Test on Emotional Intelligence (STEI; Fernández-Berrocal, Salguero, Ruiz-Aranda & Palomera, 2011). This test assesses the adult understanding and regulation skills of Emotional Intelligence from Ability theoretical model. We used the Global score named Strategic Emotional Intelligence.

Teachers' sense of efficacy scale (Brief versión; Tschannen-Moran & Woolfolk Hoy, 2001). It measures the self-efficacy perception teachers have about their ability to get educative results.

Maslach Burnout Inventory for Teachers (MBI-NL-Ed; Maslach & Jackson, 1981; Schaufeli, Daamen & Van Merlo, 1994). This instrument measures professional stress or burnout into the educative context. It obtains three components: emotional exhaustion, depersonalization and personal accomplishment.

Also, we recollected from experimental schools the number of sessions implemented during this 1, 7 years.

4. Results

In order to analyze data we conducted a Manova analysis: General Lineal Model with repeated measures through SPSS 21.

At first, we did not find almost significant results comparing experimental and control group with their respective pre-test and posttest scores after 1,7 years. These differences are located on the early stage of pre-kindergarten, where experimental group decreases on aggression and withdrawal while 2º and 4º elementary grade children decrease on aggression.

We then conducted an Ancova analysis controlling for: Number of sessions of implementation, Teacher's emotional intelligent, socio-professional data, burnout and self-effectiveness. In this case, we found interesting results, showing effects on the children development that before were hidden.

Looking at pre-kindergarten, there are new and significant effects favoring Experimental group in Anxiety, Social Skills, Stress Management and Intrapersonal Intelligence scores. The involved covariates were teacher's training on SEL, years of teaching experience and emotional intelligence. But also we found significant effects favoring control group on General Mood and Adaptability factors, when the teacher's emotional intelligence, burnout and self-efficacy were controlled for.

Also, when we attend to the older students, seven or nine-year-old students, Negative attitudes toward the Professor appear in favor of the experimental group when the covariate teacher's Emotional

Intelligence is taken into account. At the same time, Adaptability, Stress Management and Relations with parents appears with significant effects in the favor of Control group controlling for teacher's burnout and self-efficacy. Moreover, when we controlled the influence of teacher's interest and commitment with the SEL program, we showed effects on Withdrawal, Adaptability, Negative attitudes towards teachers and school in experimental group. In this same stage, intensity of the program (number of sessions implemented) influenced on Social Skills and Adaptability of children on experimental condition.

5. Conclusions

The results show the great influence of teacher variables related with their welfare, commitment, emotional skills and SEL training over social and emotional development of children in school. This confirms previous literature conclusions on the need to train teachers, since is not possible to teach what we have not reached before as teachers (Basset, Haldenby, Tanner & Trehwitt, 2010). Also, results involve not only need of controlling these variables in SEL programs research validation, but the urgency to include in pre-service and in-service teacher training, a SEL curricula to improve teachers own abilities, knowledge and awareness of their own importance for child development and programs efficacy.

References

- Bar-On, R. (1997). *Emotional Quotient Inventory-Youth Version (EQ-i YV)*. Toronto, Canada: Multi-Health Systems.
- Bassett, D., Haldenby, A., Tanner, W., & Trehwitt, K. (2010). *Every Teacher Matters*. Britain: Reform Research Trust.
- Collaborative for Academic, Social and emotional Learning. (2005). *Safe and Sound: An Educational Leader's Guide to Evidence-Based Social and Emotional Learning (SEL) Programs*. Chicago, IL: CASEL.
- Diekstra, R.E.W. (2008). Evaluación de los programas escolares universales en educación emocional, social y de habilidades para la vida. En Clouder, C. (Coord.), *Educación Emocional, y Social. Análisis Internacional, Informe Fundación Marcelino Botín* (pp. 268-329). Santander: Fundación Botín.
- Durlak, J. A. (2011). Metanálisis de los programas universales de aprendizaje emocional y social en los colegios. En VVAA, *Avances en el estudio de la Inteligencia Emocional II* (pp.175-182). Santander: Fundación Botín.
- Eisenberg, N. (2006). Volume 3: Social, emotional, and personality development. In W. Damon, & R. M. Lerner (Eds.), *Handbook of child psychology* (6ª ed.,). New York: Wiley.
- Fernández-Berrocal, P., Salguero, J.A., Ruiz-Aranda, D., Extremera, N. y Palomera, R. (2011). *Strategic Test of Emotional Intelligence (STEI)*.
- Guerra, N. G., & Bradshaw, C. P. (2008). Linking the prevention of problem behaviors and positive youth development: Core competencies for positive youth development and risk prevention. *New directions for child and adolescent development*, 122, 1-17.
- Maslach, C. y Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Occupational Behavior*, 2, 99-113.
- Reynolds, C. R. y Kamphaus, R. W. (2004). *BASC: Sistema de evaluación de la conducta de niños y adolescentes*. Madrid: TEA.
- Tschannen-Moran, M. y Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing and elusive construct. *Teaching and Teacher Education*, 17, 783-805.
- V.V.A.A. (n.d.) Educación Responsable. Retrieved on March, 2nd of 2012 from <http://www.educacionresponsable.org/>.
- Zins, J. E., & Elias, M. J. (2006). Social and emotional learning. In G. G. Bear, & K. M. Minke (Eds.), *Children's needs III: Development, prevention, and intervention*. (pp. 1-13). Bethesda, MD: National Association of School Psychologists.

EDUCATORS' PERCEPTION ON THE USE OF FOLKLORE IN PRIMARY SCHOOL

Pule Phindane

*Language and Social Sciences Education, Faculty of Humanities, Central University of Technology,
Free State Bloemfontein 9300. South Africa*

Abstract

The present paper is based on the findings from a study conducted to examine primary school educators' perception on the use of folklore. This study is thus a survey in which questionnaires were distributed to collect data from ninety-six (96) Intermediate Phase educators. The respondents were purposively selected from Grades 4-6 educators in Motheo district, Free State. The data collected was analysed using descriptive and inferential statistics. The outcomes of the study show that educators cherished the educational value of folklore. Nonetheless, they indicated that some of them have negative feelings. The implications for teacher education were highlighted and some recommendations were discussed based on the findings of this study.

Keywords: *Oral literature; folklore; Intermediate Phase; prose*

1. Introduction

Folklore being constituted of the customs, beliefs, attitudes, life style, joys, sorrows, entertainments, events, states, traditions of a particular group of people or community manifests itself as myths, legends, proverbs, riddles, tales, poetry, and other forms of artistic expression and passes down through the oral tradition. Folklore has been regarded as an integral part of the youth cultural heritage and living culture. Inculcating core values in the youth has never been limited to the home environment. Goetz (2006) as quoted in Obiweluzo (2011) define literature as a body writing, by a people or peoples using the same language. As literature could be written or oral; it does not come as a surprise to learn that there are literature materials written exclusively for adult consumption. However, it was also observed that some of the literary materials were good for children's reading and amusement. According to Obiweluzo (2011:202) children's literature is 'writing designed to appeal to children' either to be read to them or by themselves. These may include fiction, myth, legends, folk poetry fables, riddles precepts and folktales based on spoken tradition. In his study on storytelling pedagogy, Abaton (2011:126) assert that 'folk literature began in the oral tradition and it lands itself easily to retelling', it has for hundreds of years delighted children and adults as it is still doing today. Oral tradition, otherwise known as oral literature is passed down by word of mouth from one generation to another. It is thus reproduced verbatim in from memory throughout the centuries. They are therefore, communal folk stories as such no one can claim individual authorship or originality. According to Mailybaeva et al (2014:292), the word folklore in its literal translation from English means "wisdom of the nation". Folklore is created by the people and it reflects public morals and manners, people's life style, knowledge of life, nature, cults and beliefs. Mailybaeva et al (2014) also observed that children's folklore is a specific are of folk art, unites the world of children and the adult world together, including the whole system of poetic and musical-poetic genre of folklore. In their study on the use of oral literature and teaching grammar, Owiti et al (2014) observed that the collaboration between literature and language teaching enable learners to acquire language abilities, not only to communicate better, but also to use as a tool to comprehend the subject matter better. There are different forms of folklore that can be utilised by educators in their everyday teaching programmes. These may include folksongs, games, dances, riddles, proverbs, prose, drama and poetry. Banda and Morgan (2013:7) asserts that folklore as a 'reservoir of indigenous knowledge and norms' might still be drawn upon to help solve problems of social cohesion in the schools and in the society in general. Folklore can provide enrichment for instructional programme through its art forms, its content and its motivational values. When coming to proverbs, Gozpınar (2013) assert that proverbs have been used and should be used in teaching as didactic tools because of their content of

educational wisdom. Mieder (2005) argues that 'since they belong to the common knowledge of basically all native speakers, they are indeed very effective devices to communicate wisdom and knowledge about human nature and the world at large' (p146). According to Athanasiadis et al (2010), folktales are both traditional and postmodern in the sense that beside their deep historical roots and consistency, they are continually retold, thus creating a playful relationship with their audiences. Folktales usually deal with imaginary world set in the remote past. The tricksters, quest heroes, helpers or donors are embellishing the story. Folktales educate children by acting as a vehicle for cultural propagation and provide an enjoyable escape from reality (Obiweluo, 2011). According to Mazzucco (1998) myths help the individual to realize the mystery of the universe and how awesome it is. They are fruitful accounts of what happened in the past. They were embodiment of dogma and were accepted on faith (Obiweluo, 2011). They were intended to find answers on basic questions about the world. For myths, stories were filled with fantastic adventures, and they provide children insight into other cultures. Campbell (1988) speaks about four functions of myth. He mentions the mystical function, cosmological function, sociological function and the pedagogical function. All these functions help the children to have a better understanding on the cultural world they live in. This kind of folklore presents materials in a direct and simple style that appeal to children. Folktales deal with legends, customs, superstitions and beliefs of ordinary people. Children enjoy actions exhibited by individuals, colorful characters and humor. Riddles are important in folk literature with its witty sayings and entertaining features. Especially with a very simple and common use of words, riddles by saying of such property to the person who listen to it, expose intentionally remote associations. Burford et al (2003) describe riddles as brainteasers used during family or community gathering on moonlit nights. Their main purpose is to test children's intelligence. They also test knowledge of shapes, sizes, logical sequences or cause and effect relationships of what happens. Dilci et al (2012) also support Burford et al (2003), that riddles have a very important role in the development of practical intelligence and skills of the invention. As this skill is enjoyable for children, it can be used as an educational activity at any time of the day. Folklore is the most indigenous way of educating children. According to Wafula (2012) oral literature is essential because of its significant influence in the life of children. Folklore also provides a unique and invaluable insight into the belief, customs, values and aspirations of the traditional society. In most cases, folklore serves as a means of expressing social approval and disapproval. The main purpose of this study is to assess the perception of primary school educators on the use of folklore. Primary school educators are professionally trained individuals. In this regard, the perception of primary educators regarding folklore determines, largely, the frequency of its use in the primary school. Educators are solely responsible for imparting the subject matter on the learners. The perception of educators in this regard is of importance. In the words of Obiweluo (2011), perception is the process in which people's sensory experiences are organised and made meaningful. According to Obiweluo (2011), some people appear to have perceived the profound educational value of the use of oral literature for children. However, while most educators are familiar with small segments of the folklore spectrum, their familiarity with other aspects often is limited. Banda and Morgan (2013) observed that for a fact that many educators are unable to recognize or to make the most profitable use of its potential values for education. In most cases, people regarded folklore as primitive, naïve, mindless and verbatim repetition that were handed down from one generation to another. Other people show lack of interest because illiterate raconteurs in non-literate societies composed them.

1.1. Research questions

The following research questions guided this study:

- a. What are the educators' perceptions in the use of folklore in primary school?
- b. To what extent do primary school educators use folklore in the teaching and learning process?

2. Materials and methods

The aim of the research is to examine the educators' perception on the use of folklore in primary school in the Motheo district. The target population consisted of all intermediate school educators in Botshabelo area. The sample for this study consisted of ninety-six educators from the schools selected and sampled in Botshabelo. The respondents were purposively selected from Grade 4 -6 educators.

The instrument for data collection was a twenty eight (28)-item questionnaire structured on two different four-point rating scales organised in two sections in accordance with the research questions. Section A – sought information on perception of primary school educators on the use of folklore while section B – sought information on the primary school educators' use of folklore in teaching and learning process. Each item was assigned a four-point response scale of Strongly Agree – (SA), Agree – (A), Strongly Disagree – (SD), and Disagree- (D) and Very High Extend – (VHE), High Extend – (HE), Low

Extend – (LE), and Very Low Extend – (VLE) with corresponding value of 4, 3, 2, and 1 respectively. The instrument was validated by three experts: Early Childhood Education, Special Education and Library and Information Technology, respectively. Suggestions and comments from validators were used to modify the instrument. The modified questionnaire was trial tested and computed using Cronbach alpha. The reliability coefficients obtained were 0.89 and 0.86, respectively. The researcher administered the instrument to the respondents with the help of research assistants. On-the-spot collection was also made to ensure a high return. Data collected was analysed using descriptive statistics of mean (X) and standard deviation (SD). A mean of 2.50 and above indicates the benchmark for acceptance while rejection is any mean score below 2.50.

3. Results

Table 1. Mean rating on the perception of educators in the use of folklore

S/N	Item Statement	Mean	SD	Response
1	Recitation of poems indirectly trains the children in the art of effective pronunciation of language sound.	3.64	0.61	A
2	Games poetry provide avenue for socialization and adaptation; development of desirable qualities such as honesty, emotional control, fair play, leadership and unselfishness	3.41	0.52	A
3	Folklore was variously dominated by the idea of magic and by totems.	2.36	1.07	D
4	Folklore possesses vastly more aesthetic, social and personal significance than other literary materials.	2.39	0.01	D
5	Folklore possesses only crude and uninteresting forms not worthy to be used for children's literary learning.	2.02	0.88	D
6	Folklore dilutes or challenges children's belief in the Almighty God	3.41	1.01	A
7	Folklore may lead children to believe that ancestors reincarnate.	2.53	1.09	A
8	Folklore is embedded in the belief in the use of charm and magic powers.	2.30	0.93	D
9	Folklore was handed down word for word from the dim bedtime or far back ages.	2.73	0.89	A
10	Folklore is for the non-literate societies	1.92	0.91	D
11	Folklore is an individual inspired artist.	2.70	0.93	A
12	Folklore creates a leeway for children to believe in the existence of fairy spirits.	3.58	0.99	A
13	Folklore is savage reliance on the magical power of the word.	2.30	0.93	D
14	Folklore is for the non-literate societies.	1.92	0.91	D
15	Folklore broaden children's horizon by getting them to know other people and what happens in other places.	3.19	0.69	A
16	Songs, proverbs and riddles enhance children's learning of their own cultural heritage and that of others.	3.48	0.73	A
17	Folklore enhances children's learning of language and expands their vocabulary.	3.36	0.76	A
18	Children learn language through listening to story telling	3.36	0.79	A
19	Tongue twisters and riddles enhance stimulation of children cognition.	3.06	0.75	A

KEY: A = Agree
D = Disagree

The result on table 1 showed that the educators agree on 12 items out of nineteen (19) items. Items 1, 2, 6, 7, 9, 11, 12, 15, 16, 17, 18 and 19 were agreed on as being in favour of folklore while items 3, 4, 5, 8, 10, 13, 14 were rejected as being against it. The items were accepted since they have the mean rating of 2.50 and above. The only options that they did not agree with are; that oral literature possesses only crude and uninteresting forms not worthy to be used for children's literary learning and oral literature possesses vastly more aesthetic, social and personal significance than other literary materials. They were rejected since they had mean scores below 2.50 the benchmark for acceptance. Some of the items that educators ranked most include; songs, proverbs, among others. Riddles enhance children's learning of their cultural heritage, and that of others; games, poetry provide avenue for socialization and adaptation, development of desirable qualities such as honesty, emotional control, fair, play, leadership and unselfishness, and recitation of poems, and indirectly trains the children in the art of effective pronunciation of language sounds.

Table 2. Mean rating on responses of primary school educators on the use of Folklore in teaching and learning

S/N	Item Statement	Mean	SD	Response
20	Educators prefer Folklore that build children's faith in God and challenge the devil to others.	3.43	0.83	HE
21	Educators discard Crude and uninteresting forms of Folklore and replace with inspiring ones.	3.12	0.96	HE
22	I modify Folklore that involves the use of charm and magic power to depict God's power and victory over evil.	2.84	1.16	HE
23	Educators modify Folklore that portrays belief in existence of fairy spirits to disabuse the children's mind from such.	2.84	1.16	HE
24	Educators give special preference to Game poetry and recitation of poems by children	2.72	0.82	HE
25	I incorporate Myths and folktales in teaching subjects such as social studies	2.83	0.92	HE
26	I employ story telling in delivering lessons to catch children's attention and improve their learning of language.	3.19	0.84	HE
27	Educators create opportunity for competition in the use of songs, proverbs and riddles.	3.06	0.78	HE
28	Educators incorporate tongue twisters and riddles in the teaching and learning of native languages.	3.04	0.59	HE

KEY: HE = 2.50-3.49: High Extent
VHE = 3.50-4.00: Very High Extent

Table 2 presents the responses of primary school educators on the extent of use of folklore in teaching and learning process. The table shows that primary school educators use folklore to a high extent in all the items. This is observed from the mean scores that range from 2.72-3.43.

4. Discussion

The data on table 1 which showed that perceptions of educators' in the use of folklore indicates that the educators perceive them as good for children due to their educational value. This is in line with the findings of Mailybaeva et al (2014) which stated that through story telling children attune their ears to the flow of language, the imagery of words, the rhythm of speech and patterns of reading long before they are capable of meeting these through reading print of poetry, folklores and others, which have positive educational influence on children. For the author, the children can develop sensitivity to language, they learn to use various means and to select the right words, gradually mastering figurative language system through riddles. The data on table 2, on the extent of use of folklore by primary school educators, the findings show that teachers use it to a high extent in teaching and learning in primary schools. The findings corroborates the view of Obiweluo (2011) and Wafula (2012), which advocated the use of storytelling for children's ears to the flow of language and use of games. Poems provide children the avenue for socialization and development of desirable qualities such as honesty, emotional control, among others. By implication, teachers' use of folklore with appropriate modifications of the questionable ones would help meet the basic intellectual, moral, spiritual and emotional needs of children.

5. Conclusion

The study has attempted to highlight the crucial role of use of folklore in the teaching and learning situation in primary schools. Based on the findings of the study, this paper concludes that most educators do understand the importance of folklore in the teaching and learning process. The preservation of folklore as a subject will not be an easy task but the society must be properly oriented towards its acceptance. Educators themselves must cease to regard it as primitive and its practical cause must be enshrined in the syllabus.

6. Recommendations

In light of the above findings, the study recommends that educators should exploit all the genres to allow the learners to gain fully from this strategy. Other genres like songs proverbs, riddles, and tongue twisters are equally valuable sources for teaching and learning. Educators should therefore incorporate tongue twisters and riddles in the teaching and learning of indigenous language. They should learn to employ story telling in delivering lessons to catch children's attention and improve their learning of language.

References

- Abaton, O. 2011. The Folklorist as Teacher: Towards the Use of Story Telling Pedagogy. *Journal of Communication*, 2 (2): 125 – 130.
- Athanasiadis, I., Papantovakis, G., Kaplanoglou, G and Kaplanoglou, M. 2010. Children's Perception of folktales and Narration in Creece: Evidence from a novel Micro-data set: Review of European Studies Vol.2 (2): 67 – 86.
- Banda, D and Morgan W. 2013. Folklore as an instrument of education among the Chewa people of Zambia. *International Review of Education* Vol 59(2): 197-216.
- Burford, G., Ngila, O and Rafiki, Y. 2003. Education Indigenous Knowledge and globalization. *Science in Africa*, 21 [Online]. Accessed 18 April 2015 from <http://www.sciencein africa.co.za/2003/march/ik.htm>.
- Campbell, J. 1988. *The Power of Myth* with Bill Moyers, ed. Betty Sue Flowers. New York. Doubleday.
- Dilci, T., Köksal, O and Sayin, H. 2012. The views of Primary School Students on Use of Riddles in the Process of Education and Training. *Middle-East Journal of Scientific Research* 12(1): 23 – 30.
- Gözpinar, H. 2013. Proverbs about children, Georgian and Turkish culture. *Journal of Education*, Vol 2 (2):31 – 35.
- Mailybaeva, G., Utegulov, D., Guldarhan, S., Aina, R and Gulim, C. 2014. Formation of moral values of school children by means of Kazakh Folklore. *Life Science Journal* 11(5s):292 – 295.
- Mazzucco, R. 1998. *African Myth and what they teach; In cultures and their myth*. Yale. New Haven Teachers Institute Vol II.
- Mieder, W. 2005. *Proverbs are the best Policy. Folklore Wisdom and American Politics*. Utah State University Press, Logan, Utah.
- Obiweluozo, P. 2011. Perception of Primary school Teachers on the use of oral literature. *International Journal of Research in Arts and Social Sciences* Vol3: 202 – 211.
- Owitti, T., Onchera, P and Kulo, S. 2014. Use of oral literature in teaching of English grammar in secondary schools in Bondo district- Kenya. *Educ. Res.* 5(6): 183 – 191.
- Wafula, L. 2012. Teachers'attitudes towards the intergration method of learning Oral literature in secondary schools in Gishn county, Kenya. *Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS)* 3(4): 487 – 494.

HOW STRONG AND WEAK DO PRESCHOOL TEACHERS CONSIDER THEMSELVES IN INTERACTIONS

Hana Navrátilová

Department of School Education, Faculty of Humanities, Tomas Bata University in Zlín (Czech Republic)

Abstract

The interactions among all the subjects of education represent an important component of the professional lives of preschool teachers. Communication enabling interaction between the teacher, parent and child creates and develops relationships, solves pedagogical situations, helps to prevent conflicts or subsequently to manage them, but it can also be perceived as a weakness by any of communicating. This paper presents the results of the research with the respondents who are actually students of preprimary university education, yet the research includes two groups of respondents – full-time students who are just gaining experience during practice, and part-time students who already work as teachers in kindergartens. Answers to the research questions are uncovered through content analysis of students' written statements and subsequent interviews with them, all based on quality research design. What aspects of the interactions are perceived as essential to facilitate everyday communication situations? When is it difficult for them to talk to parents, children or colleagues? What are their own strengths and weaknesses in the interactions? Although interactions between the various participants of the communication in kindergarten are inherently different, and students of preprimary education of the both forms confirm a perceived difference between the ability to communicate with children versus adults in general, we find some relating elements in their statements as the escape from conflicts, building a trust in relationships, stress of the communication under the supervision of another person and mainly reflection of interaction with the child to interact with parents. As the participants are the students of preprimary education, it is also possible to use the results of such research for the individualized and intensive training in their communication skills.

Keywords: *Interaction, communication, preprimary education, preschool children, parents.*

1. Introduction

Preschool as well as other educational institutions is not (and should not be) a kind of glasshouse environment, but a place where interaction as mutual influence of all the participating subjects (Průcha et al., 2009) provides the ground for their development. According to previous research studies about teacher – child interactions, early qualitative interaction affects and predicts children's overall development. (Sakellariou, Rentzou, 2011, p. 414) Pedagogical communication is then essential means for actors in educational environment which is reflected by the participants of the present research. Research on direct interactions between the subjects of preschool education is not a new topic. Analysis of interactions between a teacher and a child occurs the most often, less attention is paid to parents and teacher's colleagues in preschool. We find more frequently the studies based on direct observation and/or analysis of video-recordings with subsequent quantitatively-oriented methods of data analysis. (Suchodoletz et al. 2014, König, 2009, Tompkins et al., 2013) The aim of this paper is to add into the field of interaction researches in the environment of preschool the reflection of interpretation of interactions by their actors themselves.

2. Research Method

The aim of the research was to explore preschool teachers' everyday interactions with the children, parents and their colleagues in the kindergarten. We focused on reflection of the participants about their strengths and weaknesses in interactions with basic three groups of subjects mentioned in conditions of preschool education. The aim was to obtain deep personal statements of respondents reflecting their position from the perspective of perceived facilities and difficulties. Therefore, the

methods of qualitative research appeared to be the most suitable to gain entrance to participants' minds. The research is divided into two phases – thematic writing was the first chosen method of data collection, specifically the written self-reflection with the basic themes defined to which the participants could rely on. The form and scope of the text overall and for the particular themes given in the form of questions were left at participants' discretion so that their statements were not unnecessarily restricted which allowed to obtain appropriate data.

Participants responded in their written reflections on these questions:

What are my strengths/ weaknesses in interaction with children?

What are my strengths/ weaknesses in interaction with parents?

What are my strengths/ weaknesses in interaction with colleagues?

What would I like to improve in my communication with other people?

Obtained statements were then transcribed and analyzed using the open coding in accordance with the principles of thematic text analysis. The resulting themes were then used for the needs of the second phase of research, as they were the basis for the semi-structured interviews with participants, in order to reveal the depth motives and causes of phenomena in the interactions as they were captured in the written reflections.

This phase is still in progress and we bring the results of the data analysis of the first phase for needs of this paper.

Students of the degree course Preschool Teachers' Training, both in full-time and part-time mode of study, were the participants of the research. The reason for engaging the both different groups of participants was to attempt to get the data reflecting the changes in perception of their abilities in interactions on the journey from student to teacher.

A total of 56 respondents (32/24) participated in the study in the first phase and we choose the method of group interviews with 20 participants divided into groups of 4 persons for further interviews.

The participants of the first group, namely full-time students have had dozens of hours of practice in kindergarten, already with their own performances aimed at developing the partial areas of knowledge of preschool children. However they obviously don't have such facilities in the level of awareness of one's strengths and weaknesses as the students of the second group who operate already in the role of directors, teachers or personal assistants of a child in kindergarten. At the time of the research, all the participants have already successfully passed the seminar on pedagogical communication so they acquired basic theoretical view of the examined issues.

3. Results

Data collected from the participants' written reflections produced extensive data material. The content and form of texts differed, the influence of theoretical instruction in the areas of interaction and communication was evident in some cases, sometimes the statements were quite distinctive, immediate, even intimate, without trying to portray the "better me". The style of the particular reflections clearly reflected author's approach to interactions, her way of looking at her performance and solving identified problems. For the purposes of this paper we choose from the data obtained such that serve to compare the two participating groups.

3.1. Identical components of perception of interaction in kindergarten for the both groups of participants

1. Role of communication

When commenting on the interactions, the participants switched directly to the part of communication soon. Their broader concept of interaction was mainly based on building the relationship with all groups of subjects (in terms of trust, respect, getting closer to each other etc.) and on interaction as the basis of the child education by guidance and example. However, the communication is considered as the base of such creation of a relationship or guidance or even as a necessary condition by all the participants. *"Only when a child gains a confidence in me, I believe that only then we can communicate with each other."*

2. Better with a child than with an adult

We find identical statements about notion of love for the children, of feeling themselves to be close to a child's perception of the world around and it's all perceived as a really strong positive aspect of participants' interactions with children. *"I'm able to identify myself with a child and I can return to a childhood."* *"I can establish well the first contact with a child, sometimes even better than with an adult."*

3. Away from conflict

We find individual statements in some participants' reflections which are not consistent with the shared components from their evaluations of strengths and weaknesses. However, almost absolute consensus applies to this and the following two categories in the texts of both groups of students. Conflicts are redoubtable component evaluated as a weakness mainly due to efforts to avoid them at all costs and that causes complications in interactions.

4. Inability to say "no"

On the grounds of that inability to refuse something that the participants disagree internally with when interacting with parents and especially with colleagues appears again in the major part of statements, it is probably a shared weakness within the daily interaction of two preschool teachers in one class. (This is a typical model of preschool classes in Czech Republic - two teachers work together permanently in the same class.) Their discussion about such common perception of difficulties could prevent conflict situations.

5. Weaknesses influences by external context

Pointing to external influences that hinder interactions is a typical element in reflections of weaknesses in interactions with all subjects. *"As for weaknesses in contact with the parents, they're not so much about my failing but rather about their own weaknesses."* In that spirit, "revealing" of weaknesses continues the most often. So the lack of time from the parents, child's bad mood, lack of interest from the other person and embarrassing topic for conversation are the reasons of difficulties in teachers' interactions. We don't find out so much about the participants' real internal difficulties

6. Development and transformation of the strengths from a student to a teacher

Less experience with interaction in kindergarten is evident when presenting the strengths by full-time students. The same experiences are perceived by their colleagues – part-time students being already in practice as their weaknesses because they have undergone these situations several times. An example is *"...my sincerity even it is uncomfortable to speak truth"* versus *"I can't always tell parents the truth openly, I tend to speak well of their child, it's hard to say negative comments."*

3.2. Specifics of perception of interactions in kindergarten by full-time students

1. Anticipating confrontations with parents

These participants describe their interactions with parents as hard to reflect because they don't come into contact with parents yet during their practice in kindergarten. However, they share in advance their fear of managing well interactions with parents, this component brings the strongest doubts of their future work and position in kindergarten.

2. Perceived helplessness of children conflicts

Even though participants can best reflect their interactions with children and they mentioned a number of their strengths as empathy, establishing relationships, active listening and others, they also expressed a perceived lack of control over situations where conflict occurs directly between the children in the classroom. *"I have a problem to meddle with children conflicts because I don't know who's right and wrong and I don't want to treat anyone unjustly."*

3. Interactions under control

The presence of experienced teachers from practice as well as students' university supervisors who help them with getting the feedback on their performance, is one of the specifics of exploring the participants' new role in kindergarten during their training. Students are aware of the impact of such supervision and it's reflected as a barrier for their direct interactions with children.

4. Seeing the practice through theory

The influence of theoretical training of full-time students is evident in supporting their arguments for perceived interaction strengths as they still spend the most of their time in seminars at the university. *"The ability of active listening is my forte. Active listening from teachers to children is also important for establishment and functioning of positive relationships."*

5. Idealization of future interactions

We find the faith in using participants' own strengths in future everyday interactions in kindergarten. However, they are often discrepancies between estimating the future and reflecting the experienced in the same text. *"I dare say that I'm not the kind of person who would step aside from his objective...My colleague necessitated just hers and as I didn't want to start with a conflict, I rather retreated."*

3.3. Specifics of perception of interactions in kindergarten by part-time students

1. Looking for excuses

A form of looking for excuses appears for this group of participants apart from the explanation of perceived weaknesses – rather reflected positives arise from the described weak points. These are

openly presented in participants' reflections in some cases ("... *my abilities are also my weaknesses, depending on the situation, sometimes I'm too buddy with children. On the other hand, I'm too honest with parents.*"). Similar statements are usually not presented in such explicit terms but the result is that we find out a minimum of disabilities reflected by the participants.

2. Role expectations in interacting with parents

The impact of a personal experience in the role of being already a parent belongs to a very strong part of the statements. "*The lack of experience with children, I mean my own children, is my weakness. I don't have my own children yet and it makes me troubles. Parents tend to reduce my working experience because of this fact.*"

3. Interconnection of interactions with all subjects

Participants presented and also often confirmed with described specific examples from their own experience that it's necessary to think about the interconnection of interaction with all the subjects in preschool environment. "*We cooperate well, me and my colleagues, parents and children see and that's amazing.*" Yet, contradictions appeared in terms of their statements and it suggests that they evaluated their abilities in interactions separately. Thus for example we find out from one of the participants that "*I think I'm empathetic*" (in interaction with children) versus "*My weakness is that I hear only what interests me.*" (in interaction with a colleague).

4. Specifics of the role of directress/assistant

Some participants assess their interaction skills not only as teachers but their role is different as they are in the position of a director or an assistant for integrated children. In both cases, they describe the major difficulties in interaction with their colleagues but also with children. "*I'm popular among children for the reason that they see me as a nice aunt who's got more time left for them.*" "*Sometimes I feel that they don't accept me as their rightful colleague and I can't talk to them clearly about it.*"

3.4. What I want to improve

Defining the components of communication as a part of interactions, in which the participants perceive the need to improve, reflects their statements of interactions in practice. They namely expressed their needs but rebound from the previous parts of their text is noticeable. The need to improve the various components of nonverbal communication – how to work with the voice and the body language – appeared the most often. These demands correspond to significant perception of their weaknesses within the interaction context which cannot be modified by participants on their own.

4. Conclusions

The vast majority of participants presented their strengths, but also weaknesses as a reflection of external conditions more than what comes from their internal reflection of current interactions. Although interaction is a mutual process, depending on both sides, it's necessary that at least the pre-service teachers who are so guided, focused more on their own role in interactions to learn to name their real personal weaknesses and all the positives too.

This paper presents analysis of the material which could be a useful tool for the development of pre-service teachers' skills. Searching for the shared components of abilities and needs of the students provides the opportunity to target clearly their preparation for described interactions and to really individualize such preparation. Each of the participants named specifically their own needs for the development of communication at the end of their written reflections. However, a supervising perceptive teacher- researcher is also able to detect the hidden needs existing in participants' reflections and to work successfully with them.

References

- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101.
- König, Anke. (2009) Observed classroom interaction processes between pre-school teachers and children: Results of a video study during free-play time in German pre-schools. *Educational & Child Psychology*. Vol. 26, p. 53 – 65.
- Průcha, Jan, Walterová, Eliška, Mareš, Jiří. (2009) *Pedagogický slovník*. Praha: Portál.
- Sakellariou, Maria, Rentzou, Konstantina. (2012) Cypriot Pre-Service Kindergarten Teachers' Beliefs and Intentions about Importance of Teacher/Child Interactions. *Early Childhood Education Journal*. Vol. 39, p. 413 – 420.

- Suchodoletz, Antje von, Fäsche, Anika, Gunzenhauser, Catherine, Hamre, Bridget K. (2014) A typical morning in preschool: Observations of teacher – child interactions in German preschools. *Early Chidlhood Research Quarterly*. Vol. 29, p. 509 – 519.
- Tompkins, Virginia et al. (2013) Inferential talk during teacher – child interactions in small-group play. *Early Chidlhood Research Quarterly*. Vol.28, p. 424 – 436.

ARTISTS, CURATORS, AND MUSEUM EDUCATORS: CHILDREN AS PART OF AN ARTMAKERS' COMMUNITY

Marta Cabral

Teachers College Columbia University (USA)

Abstract

This paper explores a research study developed around an annual exhibition of artworks by infants, toddlers, and preschoolers in a professional art gallery, relating it to current issues in art education, early childhood, and curatorial studies. During this exhibition, toddlers and preschoolers also serve as tour-guides. The children walk visitors through the gallery to present and explain their processes and explorations with art materials. As an exhibition, this show of young children's artwork aims to be a venue for meaningful experiences for children, families, and community, while having its own identity as an art exhibition in its own right.

This paper also discusses aspects relating to the use of digital media and technology as curatorial tools. Augmented Reality (AR) and Quick Response (QR) codes were used in this exhibition in innovative ways as tools in the curatorial process. They respond to existing challenges in creating a balance between the exhibition's role as a gallery exhibit in its own right as well as an educational space for people of all ages; they also give children's voices a stronger presence throughout the exhibition.

Explaining the processes and decisions involved in developing, curating, and putting together such an exhibit, this paper presents understandings about the importance of exhibiting student work in early childhood contexts. Based on data created in direct observations, journaling, and interviews with students' family and community members, this study discusses how issues of contemporary curating may have their place in early childhood contexts, within a framework of art education.

Conclusions point towards an educational approach that values children as individuals with voices and ideas that should be heard, considered, and valued. Furthermore, this research claims that through the explorations with art materials and processes, young children may identify themselves as part of a community of art makers who take charge of their explorations and their learning; who have a role and a voice in the way they influence the world around them; and who contribute not only to their own personal development but also to their broader community.

Keywords: *early childhood, art education, curating, museum education*

1. Introduction

"Where is my artwork?" Mikel asks as we walk into the gallery, "It was there, right there. Where did my artwork go? I was showing it to our visitors!" Weeks before that, Mikel, the other children, and I had taken a last look around the gallery where our art exhibition was on, talked about things that we liked and wanted to remember about the show, and carried our artworks from the gallery's walls and pedestals back to our school. Still, the memory of having his paintings and sculptures exhibited to the public stayed with Mikel, determining the way he sees that gallery and his role in it: as an artist, and a tour guide, an active voice and presence in the exhibition and the community.

As Artist-in-residence and Research fellow at the Rita Gold Early Childhood Center (RGC), an on-campus lab school at Teachers College Columbia University, I run the Center's art program. In this role, every year I curate an exhibition featuring artworks by the infants, toddlers, and preschoolers I teach. This exhibition is held in the Macy Gallery, which has year-round exhibitions of work by professional and non-professional artists, curated by both the Gallery's curators and others invited from outside. As this Gallery is also on campus, I visit it often with my young students, who over their years at RGC become very used to not only making art, but also looking at and talking about it – both their art and other artists'. Every year when Spring comes, the children and I select the artworks each of them wants to exhibit, work on their artist statements, and put our exhibition together. For three weeks we welcome visitors, give them guided tours, and host a reception open to the community in the gallery, with art activities led by the children.

Every year, as I rethink the exhibition, I ask myself questions that help me giving shape to my ideas and defining my goals. First of all, I ask myself for whom am I designing this exhibition. For the children with whom I work? For their families? For the casual visitor to the gallery? Secondly, I think about the artists whose work is being shown: if it is to be their art exhibition, how can I assist them in gaining ownership over it? In what ways can they be actively involved in the curatorial process individually and as a group? How can their voices be present and their ideas honored, even if shown through my own eyes? How I can put this exhibition at the service of advocacy for early childhood art education? Answering these questions guides me in finding strategies to proceed.

2. The exhibition: for whom?

As the artists, the children are the *raison d'être* of the exhibition, and their work is its core. Being so, it is important to me as the curator that they are offered the opportunities to feel and hold the exhibition as their own, and that they are assured that their experiences, thoughts, and processes are considered relevant and taken seriously. If the tangible results of children's artistic explorations and experimentations are on display, then those children should be the first to enjoy and appreciate the exhibition. It is my job as curator and studio teacher to find strategies to help them make that happen. The older children, taking a more active, knowledgeable, and meticulous part in the entire process of the exhibition, are necessarily more aware of their own role as artists and of the part they play in the curatorial process, making that ownership natural and almost unavoidable. For the younger children that are less aware of their participation, however, it can be more difficult to truly engage with the exhibition individually and in personal ways, and that is an important element to keep in mind throughout the curatorial process.

Personal connections to the exhibition happen in myriad ways and degrees for individual children, and they each express the importance of having their art up in the gallery in different ways. For some children, the exhibition is a prelude to bringing their nicely framed art home "for my Mommy to see it all the time" (Will, 4) or to show friends who visit for play-dates. Other children talk about the importance of having their work not only exhibited, but exhibited in a public space: because "it's real art," San (5) states, and if it is in a gallery "many people can see it" (Daniel, 4).

The conceptualization of the children's art as serious business is emphasized by Daniel, who states that "kids can be artists too, it's not only adults" (Daniel, 4). This recognition may also be based on the knowledge that many 'grown-up artists' regularly show in that very same space, and that many other adults are regular visitors to these exhibitions. The children often comment on and interrogate the artworks in other exhibitions, much as they comment and interrogate the products of their own explorations in the studio. That parallel may help some children identifying themselves as artists in their own right. This personal identification with a community of art-makers (Cabral, 2014) that may come out of studio practices of explorations with materials and critiques of artworks throughout the year, may gain extra emphasis by exhibiting the children's work in the same space and with the same seriousness that they see used for the works of their adult fellow artists.

For families, the art exhibition may be a way to see their children through the eyes of someone else, and through the lens of the seriousness and solemnity of the occasion, necessarily different from a home context. As parents and family members get to know their children as art explorers in circumstances that highlight them as creators and as capable individuals with valid knowledge, they may gain new insights of their children as important and active members of a community of art-makers. In the exhibition, the children have the expertise. They are the ones who know about the processes and the products, and who can guide the adults in making sense of the exhibition through their own eyes. But the role of families and caregivers may go beyond being visitors, and throughout the process of the exhibition (either during the preparation, the reception, or afterwards), spaces are made for families to be involved in different ways, as discussed below.

The art exhibition may also be a way of presenting and opening up activities and components of the school and the classrooms' curricula that might otherwise go unnoticed by parents and families on a daily basis. By presenting some of the children's explorations and their processes, by displaying them in ways that value their individuality and uniqueness, and by presenting them in a gallery setting, the art exhibition may also be a way of presenting the RGC's curriculum and philosophy. Seen in an art gallery, a context different from the school one in which families regularly see their children's work, adults may relate to these artworks differently. The way the exhibition is curated, calling attention to specific aspects of children's processes and explorations within a school/studio context, may nurture the place for families to have a different vantage point from which to look at the RGC's curriculum, and to eventually read it under a different light. Although in the acknowledgment that by illuminating some aspects of the school context others are necessarily left unexamined (Rajchman, 1991), and that this is done through the eyes

and the decisions of the curator, the space may be created for visitors to engage with the artworks and the artists in ways that welcome different and personal interpretations.

This showcase of processes and their interpretations is also important with regard to the general public. The gallery is a public space used by many visitors whom are not necessarily connected in any personal or professional way to the exhibitions on display, to art education, or to early childhood education, so it is particularly important that this exhibition works for the casual visitor as well, for people who are not in any way connected with the children or the RGC, and may not have any particular inclination for children's art in general. If carefully curated with the children, the families, and the community in mind, such an art exhibition may be a tangible image of "children's minds engaged in the arts as makers and appraisers by centering them within their lived experiences of self, world and relationship" (J.M. Burton, 2000, p. 330).

Through the sharing of children's processes and meaning making, some benefits of studio thinking (Hetland, Winner, Veenema, & Sheridan, 2007) may be made more clear to the lay person visiting the gallery, and eventually foster new awareness about the importance of artistic practices in education in general and specifically early childhood. This aspect is particularly important if we think that the average visitor to the gallery may not have any specific knowledge about general and artistic development in early childhood nor about the extent of children's critical thinking and mastery of materials and techniques. In a way, my curating is the "lure" into art mentioned by Smith (2012): I aim to "lure" the artist to the field of early childhood, the teacher to art, and the random visitor to (my) world and (my) fields of early childhood and art education.

3. The exhibition: curatorial process

To exhibit, Smith argues (2012), is "to bring a selection of [...] works of art, into a shared space (which may be a room, a site, a publication, a web portal, or an app) with the aim of demonstrating, primarily through the experiential accumulation of visual connections, a particular constellation of meanings that cannot be made known by any other means" (p. 30). If this idea brings a particular importance to the exhibition as an event of uniqueness, it also confers it with the responsibility of living up to that significance. In this sense, an important part of the curatorial process is deciding what to show, how to show it, and who will be a part of those decisions. The curatorial process is a collaborative one between my students and I, and it is important that children have their voices heard and, are comfortable with the interpretations I make of their processes and their artworks. Although I do determine the final product that is the exhibition, I do so based on the children's input about which works to show and how to display them – I determine the shape or the outline of the product, but not its content. The children, as co-curators, collaborate with me to decide which works to display and how, to write their artist statements and bios if they are old enough to do so, to comment on, and to critique their peers' work, to decide on the name of the exhibition, and to work on so many other aspects.

One example of the roles some children play are the guided tours that they lead: the preschoolers and some toddlers take turns in touring visitors through the gallery, offering their insights and thoughts and engaging the visitors in dialogues with the exhibition. In this way, each tour guide is curating the exhibition for each of the visitors she accompanies, offering her vision and interpretations of the works exhibited and of the exhibition itself. In the particular instance of each tour, the tour guides contribute to determine what the visitors focus on, which works they will see, and how the exhibit is presented to them. For some children, usually the older ones, the fact that visitors will be in their tours may also be an opportunity to understand and gain insights about how people view, perceive, and interact with their work (D. Burton, 2006), and how they can influence the way people see it. Tad is clear when he talks about his "Batgirl" piece: "I painted it all black so people won't see that it is made out of wood. I want them to think that this is the real batmobile." (Tad, 5). In this way, by crafting for themselves a role that is somewhere within the sphere of the curator, the tour-guide, and the museum-educator, some children may find the place to put themselves in the shoes of others, and exercise their understandings of how different people perceive different things and how these perceptions may be more or less openly influenced by others.

Different exhibitions may have different purposes, and the ways they are planned should serve those objectives. Being so, if one of the objectives of this exhibition is to showcase the children's artistic explorations and processes, that goal should be a guiding thought in the planning of what and how to show. In this documentation of experiences and processes, my curatorial focus is on each child and her or his explorations, as opposed to being on the piece produced regardless of its context. My attention rests mostly on the maker, instead of the product. Although the products – the artworks – are the *objects* that are being displayed, the processes are the *experiences* that are being shown. In this sense, the importance of the artworks is not only as a stand-alone object, but also as the outcome of processes and explorations

that may have been meaningful to their makers. In this context, my curatorial thinking goes in the direction of finding ways to make this goal clear, while crafting an art exhibition that holds its own identity as such. How can the exhibition be a way of documentation that focuses on my interpretations of the children and their explorations, taking however the products of those explorations into serious consideration and exhibiting them in a carefully gallery-appropriate way? In a way that is meaningful to the casual visitor but, as or more importantly than that, in way that honors children's work?

The design of the exhibition is decided alongside the selection of artworks to be displayed. The older children often have more of a conscious choice, whereas the younger ones tend to be more driven by the circumstances of the moment. As they make their selection, children often verbalize different reasons for their choices, making one or other piece more meaningful: "because I made it. I remember making this one" (Neeta); "because it's blue, and blue is my favorite color" (Anabela); "because my mommy will like it" (Will); "because it's very well done, very well curated" (San); "because it's football art and I love football" (Daniel); "because it's pretty" (Lili); "because it's an owl and it makes me think of my grandpa because he loves owls and I listen to owls with him" (Nepa). These ideas may be tied up to larger arguments and larger lines of reasoning and decision-making that are specific to each child and often representative of the ways children are making sense of the world through their choices and artistic explorations. For the very young children, like the infants and some toddlers, the process of experimenting with the materials is mostly just that, a process, and the final product is often forgotten, not necessarily recognized as theirs. Even so, they are given the opportunity to choose or show their preferences if they wish to do so, by holding, pointing, crawling to one piece instead of the other, or just by saying "this," or "mine," or in other way showing their interest. Sometimes, they do participate in the process, other times they choose not to. But always we try to find ways for every child to have some possibilities of finding ways to feel the exhibition as theirs.

The children's voices are also presented in the exhibition through their artist statements - both about themselves as artists and relating to each individual artwork they chose to exhibit. These statements are often long, and sometimes expressed in ways other than words - with movement or sound, for example - making it challenging to present in the gallery without cluttering the exhibition and overwhelming the visitor with written text and images that may be excessive or too didactic. Quick Response (QR) codes and Augmented Reality (AR) were two elements I used as curatorial tools to address these issues in recent exhibitions at RGC. Next to each artwork we put a QR code (a small square image similar to a barcode) that, when scanned by visitors with any smartphone or tablet using a free app, led the viewer to a statement about the piece. This could be a photo or video of the artist working on it, or a verbal statement in text or video. In this way the exhibition was kept uncluttered of too much text that could have dimmed the value of the artworks themselves, but should they choose to, visitors still had access to contextual information that could facilitate their engagement with the artworks. Visitors were also invited to use their phones to scan a photo of each child next to each the child's biographical statement (written by me). In doing so, while holding their phone up to the photo, visitors could see a video of each child talking about themselves as artists or, in the case of younger children, a video of them engaging with art materials.

4. Involving the community

Welcoming the community is an important part of exhibiting the children's work in a public space. We strive to do this in many ways, including artist statements, daily tours, the guest book, and, in a very special way, the reception. The artist statements that the older children make about their work and about themselves as artists are an important step in the acknowledgment of an audience, and may play a role in the children's understandings of what it means to "go public": as they decide what they want visitors to know about the artworks or about themselves as the art makers, the children make use of communication strategies with their audience that frequently turn into dialogues during guided tours or as comments in the guest book.

Showing visitors around the gallery can also provide opportunities for children to not only share their thoughts, but also to hear first hand the visitors' thoughts and questions and eventually understand that things can be read in many ways. These guided tours are not scripted, and depend very much on the guide's individual approach. As a group, the preschoolers decide on some things that should be said (that generally include welcoming the visitors, thanking them for coming, and pointing out the guest book where they can leave us a comment) and talk about what the guided tours can look like. Many questions are considered: should each tour guide show only their own work, or their friends' as well? Should we just tell people about the works, or should we also ask them what they think? What if visitors want to touch things? What if we don't know who made one artwork or can't remember anything about it? What if we forget about the visitors and just play on our own?

Tad, 5, a very enthusiastic and verbal tour guide, makes clear the importance of engaging people: “we have to be nice, because if people don’t come, we have no business!” And how will we be nice? How will we address all these questions and concerns? In the light of our own gallery explorations of many different art exhibitions, the children talk about not only ‘giving out’ information about the pieces, but of listening to each visitor and considering their voices as well, and in acknowledging that even if the information they possess as tour guides is most valuable and cherished, it is their own interpretation and take on someone’s artwork and that other people may see it differently. This is particularly poignant when older children talk about their works and those of others, interpreting it for, and with, visitors. As they engage in variations of “interpretive dialogue” (Hubard, 2010, p. 41) with the visitors, the children balance their own version of what is “contextual information” (Hubard, 2007, p. 17) – the things they know about the artwork – and what they ask of visitors’ thoughts and interpretations. In this way, the children’s role may become that of ‘gallery educator,’ aiming to help visitors engage in meaningful dialogues with the works exhibited.

Another major instance of welcoming the community is during the exhibition’s reception. This is a very special event in which families, friends, and casual visitors are invited to come to the gallery to see the exhibition, meet the artists, and interact with other visitors. If “engaging the public is the crux of the [...] event” (D. Burton, 2006, p. 4), I try to offer artistic explorations that actively involve visitors not only with the works exhibited, but in their own artistic explorations. These activities are experiences with materials that result in a community piece that is then hung at RGC as a reminder of not only a joyful shared occasion, but also of the year long processes of art making that the exhibition represents.

5. Conclusion: giving other artists their turn

“I could look at it forever,” Tad (5) utters, looking at his friend’s work. And I could too. The art show is a special occasion in that way, and no matter how many times we step into the gallery the joy of being greeted by our work does not get old. But as much as we like having our work on display, the gallery is a shared space, and as with many of the shared things in our school the children know we have to take turns. And so when time comes to give other artists a turn to show their work, most children are able to understand and explain why. Some children do it with sadness, others, like Will (4), with the joy of bringing their work home for “mommy to see it all the time.” Before we take down the exhibition, the preschoolers visit the gallery one last time, and we read the comments that visitors left on our guest book. As happened when we first installed the exhibition, children participate in demounting the artworks and carrying them back to the classroom. It is not always easy to actively put an end to your exhibition, but participating in the de-installation is a way through which the children may take responsibility for another necessary part of the exhibition, and gain an increased awareness of the process and the situation. Sometimes, when we visit the following exhibition the week after, we still talk about how it felt to have our art exhibited, and why we had to take it down. And we get inspired, and go back to our little studio, our materials, our tools, and our explorations – there will be another art show next year, and we can’t wait to get started. “I’m gonna make more paintings, and then they will be in the art show again,” Mikel finally decides, looking at me with resolution. “Yes they will,” I smile back.

References

- Burton, D. (2006). Exhibiting student art: the essential guide for teachers. New York: Teachers College Press.
- Burton, J. M. (2000). The configuration of meaning: learner-centered art education revisited *Studies in Art Education*, 41(4), 330-345.
- Cabral, M. (2014). *Broken things can be beautiful things: early childhood explorations in play and art*. New York: Vast Playground.
- Hetland, L., Winner, E., Veenema, S., & Sheridan, K. M. (2007). *Studio thinking: the real benefits of visual arts education*. New York: Teachers College Press.
- Hubard, O. (2007). Productive information. Contextual knowledge in art Museum Education. *Art Education*(July), 17-23.
- Hubard, O. (2010). Three modes of dialogue about works of art. *Art Education*(May), 40-45.
- Rajchman, J. (1991). *Philosophical events : essays of the '80's*. New York: Columbia University Press.
- Smith, T. (2012). *Thinking contemporary curating*. New York, NY: Independent Curators International.

DEVELOPING DIGITAL COMPETENCE IN NON-TRADITIONAL PROGRAMMING ENVIRONMENTS

Maria Csernoch & Piroska Biro

Faculty of Informatics, University of Debrecen (Hungary)

Abstract

We argue and provide examples that developing computational thinking is not the privilege of traditional programming environments. Digital competence requires high level of computational thinking, however, recently developed digital tools – hardware and software –, support surface approach computer solving methods, disguised as “user-friendly” environments. We have invented a deep approach problem solving method in spreadsheet, entitled Sprego. The method takes advantage of the traditional programming methods, the functional language in the background, and the convenient handling of spreadsheets. The combination of the traditional and the recently emerged e-tools would lead us to powerful methods for developing high level computational thinking and digital competence.

Keywords: *Sprego, algorithmic skills, programming in spreadsheets, deep approach problem solving*

1. Introduction

Recent reports have found and suggested that Computer Sciences and Informatics follow and should follow different tracks. In the most extreme opinions only traditional programming environments would serve as tools for developing algorithmic skills, computational thinking (Wing, 2006), digital competence. However, we argue, in accordance with several previously published opinions, that for developing digital competence not exclusively traditional programming tools can be applied.

We have recognized that there is a tight bond between traditional and non-traditional programming tools and such as both would serve as background for developing digital competence (Biró & Csernoch, 2013, 2014; Csernoch, 2014; Csernoch & Biró, 2013, 2014, 2015; Sestoft, 2011), and the well developed and effective methods of teaching programming languages in traditional environment can be adapted (Mayer, 1981). Based on these premises we have introduced deep approach metacognitive methods to computer related problem solving in non-traditional software environments (Csernoch & Biró, 2014).

Students of the University of Debrecen have been tested in the last four academic years in pre-, post, and delayed post-tests (one year later than the post-test) to compare the effectiveness of our novel approach (Csernoch & Biró, 2013, 2014). The statistical analyses proved that compared to the ineffective and error prone surface approach methods, our deep approach methods are able to improve the level of the students' algorithmic skills significantly and this knowledge is stored in long-term memory. These findings proved that deep approach computer related problem solving is not the privilege of traditional programming environments, but it is also available for non-professional end-users. The ultimate goal of the developing of the end-users' algorithmic skills is to lessen the number of error prone documents and the time, the human and computer resources required to solve computer related problems (Panko, 2008).

2. Sprego programming

In spreadsheet environment we developed a method entitled Sprego programming. The main language oriented characteristics of Sprego language are the following (Csernoch & Biró, 2015):

- We use as simple and as few general purpose functions of the spreadsheet language as possible, a dozen functions altogether (Sprego functions).
- Based on these functions we build multilevel functions and formulas.
- We build array formulas.

The Sprego functions are the following: MIN(), MAX(), SUM(), AVERAGE(), LEFT(), RIGHT(), LEN(), SEARCH(), IF(), INDEX(), MATCH() AND ISERROR() (Csernoch & Biró, 2015). With these characteristics

Sprego fulfills all the requirements of a first language. Consequently, spreadsheet languages can be used as introductory language for programmers and as the ultimate language for end-users.

Beyond these language oriented advantages, Sprego has further remarkable characteristics:

– In spreadsheet environment real world problems can be solved, and such as the tables carry real content, instead of the artificial and semi-authentic programming problems, frequently used in teaching high level programming languages.

– The multilevel formulas along with the tools of the spreadsheet programs allow and support debugging.

– The phenomenon of function known from Mathematics is strengthened, and a bridge is built between these approaches of function (Sestoft, 2011).

Considering all these characteristics of Sprego, it is clear that we found a deep approach metacognitive method in a non-traditional software environment which fulfills the requirement both of concept-based and CAAD-based (Computer Algorithmic and Debugging based) approaches (Csernoch & Biró, 2014). In the following, we demonstrate how Sprego can be used for developing algorithmic skills and programming abilities.

3. Sprego examples

The process of programming in Sprego happens exactly the same way as in traditional programming languages. Based on the available input to reach the planned output we build algorithm, carry out the coding and finally the debugging. In spreadsheet programming the input is the table, the output is the result of information retrieval, which appears in the table as the output of formulas.

We simulate a spreadsheet environment, whose table is presented in *Figure 1* (Tallest Buildings, 2015), while the problems to be solved in Tasks 1–7. The coding is carried out with array formulas, whose advantage is over copying simple formulas is that we can make the formulas less error-prone and fasten up the coding process.

3.1. Analyzing the table

The table has seven columns and the field names of the columns explain their content. Columns A, D, E, and G are simple, with correctly recognized data in each column. However, Columns B and C contain two data in each cell with additional characters marking the measurement unit, consequently recognized as text (Task 1 and Task 2). Column C is even more complicated than B, since not all items of the array has value (Task 5). In column F, hardly recognizable, but there is leading Space character just before the name of the countries (Task 3).

Figure 1. Sample table of the tallest buildings under construction (retrieved February 3, 2015)

	A	B	C	D	E	F	G
	Building	Planned pinnacle height	Planned roof height	Floors	Planned completion	Country	City
1	Kingdom Tower	1,008 m (3,307 ft)	1,000 m (3,300 ft)	214	2019	Saudi Arabia	Jeddah
2	Suzhou Zhongnan Center	729 m (2,392 ft)		144	2020	China	Suzhou
4	Ping'an International Finance Center	660 m (2,170 ft)	555 m (1,821 ft)	115	2016	China	Shenzhen
5	Wuhan Greenland Center	636 m (2,087 ft)	600 m (2,000 ft)	124	2017	China	Wuhan
6	Rama IX Super Tower	615 m (2,018 ft)		125	2019	Thailand	Bangkok
7	Warisan Merdeka	601 m (1,972 ft)		128	2021	Malaysia	Kuala Lumpur
8	Goldin Finance 117	597 m (1,959 ft)	597 m (1,959 ft)	117	2018	China	Tianjin
9	Tianjin Chow Tai Fook Binhai Center	588 m (1,929 ft)	580 m (1,900 ft)	106	2015	China	Tianjin
104	Landmark Waterfront	298 m (978 ft)		83	2018	Thailand	Bangkok
109	Sahria Icon Tower	260 m (850 ft)		67	2016	Pakistan	Karachi
106	Kempinski Hotel	260 m (850 ft)		69	2017	Saudi Arabia	Jeddah

3.2. Separating data

We have to create two columns for the two data, originally entered in column B. We have two options: (1) we cut out one of the fake numbers, convert it to a real number, and then calculate the other or (2) we cut out both fake numbers and then convert them to numbers. If we carry out both of the solutions we have the opportunity to check the correctness of the original data.

Task 1. Write out in a separate column the “Planned pinnacle height” in meter.

The characteristics of Task 1

- The output should be number, while the input is text.
- These characters are positioned on the left side of the cell.
- The numbers contain different number of digits.
- They are left to the opening parenthesis.
- The number of digits is four characters less than the position of the parenthesis.

The algorithm of Task 1

- Calculating the position of the opening parenthesis (S1).
- Calculating the length of the number (S2).
- Cutting out the left side of the original string, the number (S3).

The coding of Task 1

S1 {=SEARCH("(",B2:B106)}
 S2 {=LEFT(B2:B106,SEARCH("(",B2:B106)-4)}
 S3 {=LEFT(B2:B106,SEARCH("(",B2:B106)-4)*1}

Task 2. Write out in a separate column the “Planned pinnacle height” in foot.

The characteristics of Task 2

- The output should be number, while the input is text.
- These characters, fake numbers are positioned on the right side of the cell.
- Followed by four characters.
- They contain different number of digits.
- They are between the opening parenthesis and the end of the string.
- The number of digits can be calculated from the length of the string and the position of the opening parenthesis.

The algorithm of Task 2

- Calculating the length of the string (S4).
- Calculating the position of the opening parenthesis (S1).
- Calculating the difference of these two numbers (S5).
- Cutting out the right side of the original string: the number, a space, “ft”, and the closing parenthesis (S6).
- Calculating the length of this string (S7).
- Calculating the length of the number, the number of digits (S8).
- Cutting out the left side of this string (S9).
- Converting the text into a number (S10).

The coding of Task 2

S4 {=LEN(B2:B106)}
 S5 {=LEN(B2:B106)-SEARCH("(",B2:B106)}
 S6 {=RIGHT(B2:B106,LEN(B2:B106)-SEARCH("(",B2:B106))}
 S7 {=LEN(RIGHT(B2:B106,LEN(B2:B106)-SEARCH("(",B2:B106)))}
 S8 {=LEN(RIGHT(B2:B106,LEN(B2:B106)-SEARCH("(",B2:B106)))-4}
 S9 {=LEFT(RIGHT(B2:B106,LEN(B2:B106)-SEARCH("(",B2:B106)),
 LEN(RIGHT(B2:B106,LEN(B2:B106)-SEARCH("(",B2:B106)))-4)}
 S10 {=LEFT(RIGHT(B2:B106,LEN(B2:B106)-SEARCH("(",B2:B106)),
 LEN(RIGHT(B2:B106,LEN(B2:B106)-SEARCH("(",B2:B106)))-4)*1}

To write out the “Planned roof height” one has to use the very same algorithm and apply minor changes to the codes (S11 and S12). However, in column C we have to take care of the empty cells (Task 5, S18 and S19).

S11 {=LEFT(C2:C106,SEARCH("(",C2:C106)-4)*1}
 S12 {=LEFT(RIGHT(C2:C106,LEN(C2:C106)-SEARCH("(",C2:C106)),
 LEN(RIGHT(C2:C106,LEN(C2:C106)-SEARCH("(",C2:C106)))-4)*1}

Task 3. Remove the leading Space character from the name of the countries.

The characteristics of Task 3

- Left to the name of the countries there is an extra Space.
- The right side of string should be kept.
- The name of the country one character shorter than the length of the text in the cell.

The algorithm of Task 3

- Calculating the length of the text (S13).
- Calculating the length of the name of the countries (S14).
- Cutting out the name of the country, the right side of the original string (S15).

The coding of Task 3

S13 {=LEN(F2:F106)}
 S14 {=LEN(F2:F106)-1}
 S15 {=RIGHT(F2:F106,LEN(F2:F106)-1)}

After removing the extra Space character from the strings we can replace the original array of cities with array holding the correct names of the cities.

3.3. Conditional Sprego formulas

Task 4. Write out of the cities of the country entered in F108. If the building is not in the given country then leave the city empty.

The characteristics of Task 4

- The country of the building is stored in column F.
- The countries of column F should be distinguished based on the country entered in F108.

The algorithm of Task 4

- We ask the question whether the countries match the country entered in F108 or not. in one formula we ask as many questions as the number of the buildings, 105 (S16).
 - If the country is matched the output is a city (S17).
 - If the country is not matched the output is "", the empty string (S17).
- The result of these questions is an array with cities and the empty strings ("").

The coding of Task 4

S16 {=I2:I106=F108}

S17 {=IF(F2:F106=F108,G2:G106, "")}

Task 5. Handle the empty cells of column D during the separation of the numbers.

The characteristics of Task 5

- There are buildings whose “Planned roof height” is unknown. These cells are empty.

The algorithm of Task 5

- Separating the empty cells from the real data cells. We ask the question whether the cells of the array are empty or not. We create one formula with as many questions as the number of the buildings, 105.
- If the cell is found empty we write out the "" string (empty string).
- If the cell is not empty we separate the two numbers with the known formulas of S11 and S12.

The coding of Task 5

S18 {=IF(C2:C106="", "", LEFT(C2:C106, SEARCH("(", C2:C106)-4)*1)}

S19 {=IF(C2:C106="", "", LEFT(RIGHT(C2:C106, LEN(C2:C106)-SEARCH("(", C2:C106)), LEN(RIGHT(C2:C106, LEN(C2:C106)-SEARCH("(", C2:C106))-4)*1)}

The restrictions on the built-in conditional spreadsheet functions generate so many problems that neglecting them and find solutions which would overrule them is most welcomed. With the use of Sprego functions we can avoid the use of the built-in conditional functions, and we have the opportunity to solve problems for which there is no built-in function.

Task 6. Type a country in F108. Tell the number of those buildings in this country.

The characteristics of Task 6 are exactly the same as of Task 4, consequently, the algorithms are very similar.

The algorithm of Task 6

- We ask the question whether the countries match the country entered in F108 or not (S20).
- If the country is matched the output is 1 (S20).
- If the country is not matched we leave the output to the default FALSE (S20).
- The result of these questions is an array with 1s and FALSEs. However, we are not interested in all the components of this array, consequently, we use only one cell for the output.
- We sum the components of the array, which is the number of the 1s, the number of those buildings whose country matches the country in F108 (S21).

The coding of Task 6

S20 {=IF(F2:F106=F108,1)}

Since only one cell is facilitated to display the output, the first component of the array appears.

S21 {=SUM(IF(F2:F106=F108,1))}

The number of the buildings in the country given in F108 appears.

Task 7. Type a year in E108. Tell the average number of floors in those buildings which are planned to be finished before or in this year.

The algorithm of Task 7 (solving Task 6 and Task 7 we use the same algorithm)

- We ask the question whether the years are less than E108 (S22).
- If the answer is yes, the output is the number of the floors (S22).
- If the answer is no, the output is left to the default FALSE (S22).
- We calculate the average of this array (S23).

The coding of Task 7

```
S22  {=IF(E2:E106<=E108,D2:D106)}
S23  {=AVERAGE(IF(E2:E106<=E108,D2:D106))}
```

4. Conclusions

We have presented examples how spreadsheets can be used as a programming language. The method, Sprego programming, is a deep approach metacognitive problem solving method. The effective methods and solutions of traditional programming languages are adapted into a non-traditional, user-friendly environment. The key concept of Sprego is that we use as simple and as few general purpose functions as possible, and based on these functions we build multilevel formulas, and whenever it is possible array formulas. Beyond the language specialties of the method, we heavily rely on the content of the documents, so the users get interested and highly involved in the data and information retrieval process. They find it usable in real life.

We have tested the effectiveness of the method in the last couple of years with freshmen students of Informatics by administering a sequence of tests: a pre-test, before Sprego – after studying spreadsheet for years with the “classical” method –, a post-test, just right after covering Sprego, and a delayed post-test, one year later. With these tests we were able to prove that Sprego is much more effective than the popular, almost exclusively used surface approach methods. We can lessen the error prone spreadsheet documents and improve the level of computational thinking of our students.

Acknowledgement

The research was supported partly by the TÁMOP-4.1.2.B.2-13/1-2013-0009, SZAKTÁRNET projects, supported by the European Union, co-financed by the European Social Fund. The research was supported partly by the Hungarian Scientific Research Fund under Grant No. OTKA K-105262.

References

- Biró, P. & Csernoch, M. (2014). Deep and surface metacognitive processes in non-traditional programming tasks. In: *5th IEEE International Conference on Cognitive Infocommunications CogInfoCom 2014 Proceedings*. IEEE Catalog Number: CFP1426R-USB, Italy, pp. 49-54.
- Biró, P. & Csernoch, M. (2013). Deep and surface structural metacognitive abilities of the first year students of Informatics. In: *4th IEEE International Conference on Cognitive Infocommunications. 2013 Proceedings*. IEEE, Budapest, pp. 521-526.
- Csernoch, M. (2014). *Programozás táblázatkezelő függvényekkel: Sprego*. Ed. Bosznai Gábor, Budapest, Műszaki Könyvkiadó, 2014. 96 p.
- Csernoch, M & Biro, P. (2015). Sprego Programming. *Spreadsheets in Education. Vol. 8. Iss. 1*. Retrieved February 8, 2015, from <http://epublications.bond.edu.au/ejsie/vol8/iss1/4/>.
- Csernoch, M. & Biró, P. (2014). Spreadsheet misconceptions, spreadsheet errors. *Oktatáskutatás határon innen and túl. HERA Évkönyvek I.*, ed. Juhász Erika, Kozma Tamás, Publisher: Belvedere Meridionale, Szeged, 2014, pp. 370–395.
- Csernoch, M. & Biró, P. (2013). Teachers' Assessment and Students' Self-Assessment on The Students' Spreadsheet Knowledge. *EDULEARN13 Proceedings 5th International Conference on Education and New Learning Technologies*, Barcelona, Spain. pp. 949–956.
- Mayer, R. E. (1981). The Psychology of How Novices Learn Computer Programming. *ACM Computing Surveys*, vol. 13 (1), pp. 121–141.
- Panko, R. R. (2008). What We Know About Spreadsheet Errors. *Journal of End User Computing's. Special issue on Scaling Up End User Development*. (10)2, pp. 15–21.
- Sestoft, P. (2011). Spreadsheet technology. Version 0.12 of 2012-01-31. IT University Technical Report ITU-TR-2011-142. IT University of Copenhagen, December 2011.
- Wing, J. M. (2006). Computational Thinking. March 2006/Vol. 49, No. 3 *Communications of the ACM*. *Tallest buildings*. (Latest Update: February 2, 2015) List of tallest buildings in the world. Retrieved February 3, 2015, from http://en.wikipedia.org/wiki/List_of_tallest_buildings_in_the_world.

AN INVESTIGATION OF SELF-REGULATED STRATEGY DEVELOPMENT AS A FRAMEWORK TO ENHANCE STUDENT WRITING IN AN AUSTRALIAN MAINSTREAM CLASSROOM

Robin Smith

Faculty of Education & Social Work, The University of Sydney (Australia)

Abstract

There is consensus across research that writing is a complex and challenging task. Relative to maths and reading, however, research into writing is limited. The Neglected R (2003) stressed the need for a more proactive approach to examining and supporting the writing ability of all students so they can write at a level expected in today's literate society.

One approach to scaffolding the development of writing skills is self regulated strategy development (SRSD). This framework aims to integrate successful writing strategies with critical strategies for self-regulation of the writing process. The ultimate goal of SRSD is to teach students to become independent users of the cognitive and meta-cognitive strategies used by successful writers. The focus of most of the research of SRSD has been with students with learning difficulties however there are indications that this approach can be of benefit to all students.

This paper will examine research aimed to investigate SRSD within the context of an Australian mainstream class. The study used a mixed method quasi-experimental approach with a treatment and a comparison group of two Year 5 mainstream classes (59 students).

Writing outcomes were examined through four dependent variables: writing improvement, selfregulatory behaviours, writing understandings and writing confidence. Data used was both quantitative (writing samples and surveys) and qualitative (interviews) and collected at three points (i.e., pre-test, posttest, maintenance). An analysis of results was undertaken to establish differences both within and between the two groups over the three time periods of the study.

Reference National Commission on Writing (2003). The neglected R: The need for a writing revolution. Retrieved 13/5/10, from www.collegeboard.com.

Keywords: *Student writing difficulties, self regulation.*

SELF-REFLECTING LOG AS A METHOD IN INTERVENING STUDIES

André Rondestvedt

Department of Education, UiT Arctic University of Norway (Norway)

Abstract

The focus in this paper is how one can systemize the researcher's ethical reflection by using a log in intervening studies. A field that not much light has been shed on, particularly through practical examples. The intention is to describe how one can develop a log, test it in practice, and through this, show the possibilities that exist in using a structured log. The prepared problem is: how can a log contribute to systemizing the researcher's ethical reflection in intervening studies? Literature studies on the topic and practical experiments are used as methods. My own PhD study has been an arena for developing and testing the log. Selected examples from this will be used as data. The results show that the log managed to systemize my own ethical reflection, of how I have behaved towards others, how I have affected the field, what one had access to and what one did not have access to, and how the log has allowed others to understand the researcher's choices during the process. The conclusion is that the log was an important method in order to systematize the researcher's ethical reflection. But the choice of content and structure in the log has governed the focus. One's eyes have been directed towards these choices. By making other choices the same results or others could have been achieved.

Keywords: *Log, ethical reflection, intentions, self-reflecting, intervening study*

1. Introduction – Why focus on systematic ethical reflection?

Research morals are a part of all research. The proximity of the participants leads to several moral challenges for researchers in intervening studies. There are, amongst other things, demands on how one acts. *If we are to live and work together with other people, we cannot do what we want (Kversøy 2005, p.14).* It is not guaranteed that one will have access or will be able to have continual access during the process and the field work. When researchers carry out an action such as having conversations with respondents before, during and after observations and interviews, this is done in accordance with what we believe is right, wrong and good as regards the situation we are in (Kversøy 2005). But what does a good action mean? Kversøy (2005) is inspired by Aristotle and Plato when he explains that good actions consist of a passable mixture of feelings, sensibility and courage. The process is described from having good intentions (wanting the best for everyone), using your sensibility consisting of knowledge and experience in a wise way. In addition, use your feelings and mix them with sensibility so that they do not run wild, or are cold and absent. Finally dare to act, but avoid being foolhardy. Don't let it remain a thought, or chicken out. Kversøy (2005) goes on to describe that even after mobilising wisdom, moderation and courage, and combining them with the best intentions, it can still go wrong. One must reflect over the events. *Subsequent reflection is therefore required over whether what one did was actually of benefit to the long term health of the inter-human relationship (Kversøy 2005, p.80).* To reflect is to think again. In this case about research morals. Kversøy (2005) writes that to reflect is to blow the dust of habitual thinking. We can challenge our habitual thinking by reading a book on the topic, having conversations with others or, as I will add, by writing a log that leads to a conversation with oneself. If one chooses a log, the researcher's pre-understanding of his own values when meeting the field will be an important starting point. Our values as humans are central for clarifying some intentions that one can reflect over during the process. In addition having an overview of all the reflections by systemizing them will contribute to one being more conscious of oneself. In my research within social sciences and the choice of an intervening study, it is interesting to be consciously aware during the research process. Study the different situations and events in the process by writing a self-reflecting log.

2. Method – How was the study carried out?

The chosen methods shall contribute to solving the problem: how can a log contribute to systemizing the researcher's ethical reflection in intervening studies? The methods are a technique for promoting new knowledge on the topic. *Method is a technique, a means to solve problems and come upon new knowledge. Any method that serves this purpose belongs in the arsenal of methods (Hellevik 1991 in Bjørndal 2011, p. 29).* At first the desire is to search in literature on the topics, type of log, structure of the log and in accordance with intentions that can suit my own values. Information on reflection logs and intentions can mostly only be found in books on the topic guidance/guidance education or interaction. A provisional selection has been made here and limited to Kversøy (2005, 2008) and Bjørndal (2011). The intentions are described through Kversøy's (2005, 2008) terms; wanting the best for everyone, openness of mind and phenomenological respect. Furthermore, the log is structured as a meta-cognitive log. This type of log is described in more detail through Bjørndal's (2011) descriptions of the development and structure of logs.

The experimental testing of the chosen log was carried out for my field work for my own PhD thesis. The study has an intervening approach (Kalleberg 1992, 1996, Kemmis 1998, Postholm 2009, Brekke and Tiller 2013, Hiim 2013) based on searching for answers to the problem; What can schools do to integrate "making theoretical subjects more practical" in vocational education? The intention is to show didactic possibilities that can facilitate an increased desire to learn and learning in the more general theoretical subjects for practically orientated students. This can be done by the theoretical subjects being a part of the practical subjects' proficiency learning process. The implementation of "making theoretical subjects more practical" in technological school classes within mechanical subjects, electro subjects and transport subjects was studied in the field work. The methods that were used to obtain findings were group interviews of teachers (Halkier 2010), observations (Bjørndal 2011) of the classes when they were working on different projects and interviews (Holstein & Gubrium 1995, Kvale 2009, Tjora 2012, Nilssen 2012) with pupils and teachers. The log was written during the field work, which was carried out in periods of the school years 2013/2014 and 2014/2015. It was done after important meetings, group interviews, pupil/teacher interviews and observation.

3. Results – How are the log's structure and own intentions described in the literature?

3.1. The structure

The choice of having a structured log was the desire to capture some concrete conditions that shall contribute to ensuring the good intentions in my own consciousness. According to Bjørndal (2011), unstructured and open logs can quickly be difficult to process and analyse afterwards. There can be a lot of text and it can be labour intensive to process the log. This is avoided with a structured log. At the same time, however, I can lose something that is not immediately at the forefront of my consciousness. The log design can be done in many ways. My choice is to make it clearly set out and simple, so that the log is clear and easy to use. The log is based on the meta-cognitive. I.e. the knowledge and insight we have on our own thought processes. The aim here is to reflect over one's actions and learn from them. One starts with the researcher's description of what happened, then how the researcher experienced it and finally what it would be wise for the researcher to do next time. I used the log in figure 1 in the start-up phase of the field work. It was then that the need to describe what I felt about some chosen intentions was discovered. The intentions are described below. The log was therefore further developed to that shown in figure no. 2.

Figure 1. Reflecting log

Reflecting log date/time
What happened?
How did I experience it?
What can it be wise to do next time?

Figure 2. Self-reflecting log

Selv-reflecting log date/time
What happened?
How did I experience it?
What did I feel as regards my own intentions?
What can it be wise to do next time?

A self-reflecting log is a reflection of my own experiences when encountering the participants in the field work. It is about how well I see and assess myself in given events and situations. In order to assess oneself, one must first ascertain what parts were in the situation. Bjørndal (2011) writes that the assessment builds on ascertainment. One must obtain information through, for example, descriptions in a log. The more thorough the ascertainment process is, the more sure you can be that the assessment of the situation is correct. In my log, the ascertainment process was done through descriptions of researcher

situations encountering the field. The assessment was made through interpretation and reflection starting with the good intentions. The good intentions of wanting the best for everyone, openness of mind and phenomenological respect must be seen here as my assessment criteria.

3.2. The intentions

An interpretation of Kversøy's (2005) description of good actions tells me that the researcher's good actions are based on the intentions one has and what one manages to show in practice. For me, the intentions of *wanting the best for everyone, openness of mind and phenomenological respect* are important. Managers, teachers and pupils should feel and experience that I want to make everyone happy. To me this means that when I was challenged to give input from teachers or pupils during the research process, I should have contributed or shared my knowledge and previous experience from work as a vocational educationalist and specialist educationalist. If the participants did not want contributions, I should have also respected this. I therefore opened the possibility to influence the field with my presence. With the intention of doing what is best for everyone. It is a case of the participants experiencing fairness in the interaction between me as a researcher and them. Such as, for example, when a teacher needed to discuss special educational measures in an interview. Or when a pupil asks me about how he can become an engineer and how it was for me to work as one. I took the time to discuss this. Talked about the topic and tried to contribute. Even if it took the focus away from the interview. In practice it shows that I care and wanting the best for everyone.

A researcher's pre-understanding of, or belief in a theory means that one can act with direction. *One knows that something works and can act accordingly* (Kversøy 2008, p.195). But at the same time it has the potential to be confining for one's thoughts. Kversøy (2008) describes that when theories are seen as absolute and immovable truths, they can prevent openness of mind. Openness of mind is about being open to new ideas. *Openness of mind means accessibility of mind to any and every consideration that will throw light upon the situation that needs to be cleared up, and that will help determine the consequences of acting this way or that* (Dewey 2009, s.129). The researchers' proximity to the participants in intervening studies challenges us to have an open mind to new things that can throw light over situations that can lead to improvements. A prerequisite is that one must be willing to put habits to one side in order to discover new things. *Discovery can often mean that I have to change my perception, i.e. give up what I previously believed in favour of something I am now finding out* (Grendstad 1986, p.31). Most of us have the ability to be both open and closed according to different situations. In my study, where the focus is to allow for an increased desire to learn and learning, openness of mind will be important when faced with the teachers and pupils' opinions on actions and experiences within the topic.

As a researcher one gets an insight into other people's opinions of experiences they have had. We will most likely get different meanings from different teachers and pupils. *We comprehend and experience reality through our own filter of understanding and our own glasses* (Kversøy 2008, p. 197). Respecting different opinions is therefore important. The researcher must show the different descriptions. Kversøy (2008) describes this as phenomenological respect. Phenomenology is the theory that my experiences are something that I know best myself. No one else can say what I think and feel about an experience. This can be a challenge during research interviews. For example, when pupils describe their experiences differently. The researcher will then have the opportunity to request more detailed questions in order to seek an understanding of the differences through dialogue. At the same time the researcher must ensure the interview's phenomenological respect. This is something that can often prove to be difficult. One can quickly influence the pupils and get them to mean something different than what they originally had thought.

4. Results – How did the log function in practice?

Chose to divide the finds into three different phases. Start-up – during and completion phases. A greater need to put more focus on being conscious of my own good intentions and how they are ensured in practice is experienced during the start-up phase. The new self-reflecting log (see figure no. 2 p. 2) was therefore used in the during and completion phases. Out of consideration to relevance and limited space, an extract from the logs in the study will be shown in the presentation of the finds. The logs will not be presented in their entirety, but summarized in the different phases.

4.1. The start-up phase – establishing contact with the field

Finds from the log in this phase show that it was difficult at the start to get access to the field. The ambition to have an action research project that was too large was the reason. Contact with other schools led to restricted access in the field. Not all the teachers were equally enthusiastic about the topic. Some teachers wanted me to carry out research on their development work, but they did not want to carry

out an action research project. They did not want to spend more time on planning and in meetings. But they invited me to carry out research about the work they were doing and their development efforts. Observe and interview pupils during the study when they worked on various projects. The logs show that I had real access to the field then. I had access to the implementation. Not the planning. New agreements were made. Next time it would be wise to consider changing the project from an action research project to an intervening qualitative approach. Even if there are major similarities here, there are also differences. Furthermore, I must consider changing the log. Proximity to the teachers and pupils will challenge me as a researcher.

4.2. During the study phase – An intervening research and development project

The finds from the log in this phase show that I gradually became clearer in using the new logs. Used the logs more concretely for individual events that were interesting and relevant. Such as when a teacher asked me to talk with a pupil who had been admitted on special educational terms. The teacher wanted some educational input. This was something I agreed to do. Even if I was there to observe pupils' actions. Finds from this log show that I was thinking that it was the correct decision to make, when seen in relation to my intentions. I ensured that I was wanting the best for everyone and I took the teacher seriously. One find shows that a pupil asked me during an interview what it takes to become an engineer, and whether I had worked as an engineer. I thought that this was important for him, so I took the time to have a dialogue with him on the topic. Another find from the logs was uncertainty of how well I managed to explain the changes that were made during the study to the teachers. Changes that occurred through the field work and reading theories. I tried to correct this, but did not manage to fulfil all of my intentions in this case. Other finds show the challenge when different pupils from the same class have different opinions on actions and experiences. Was uncertain here as to how much influence I had. As I had followed up with questions in order to find an explanation for the differences. How good was I at ensuring the pupils' phenomenological respect.

4.3. Completion phase – good relations

Finds from the completion phase show that good relations were created between me as a researcher and the teacher. I was always welcomed and well received. The teachers wanted a summary and feedback after the interviews with the pupils. A last group interview was agreed with all the teachers and in this I gave an account of the pupils' opinions and proposals to improvements of the projects. This find shows that I had access to the teachers' assessment of the implementation of the development efforts. The finds show that the teachers described the period as informative for them and they felt that they were left with something.

5. Conclusion – What can one conclude from the results?

Both the literature study and the practical experiment from my own PhD study show how a log can contribute to systemizing the researcher's ethical reflection in intervening studies. The literature study shows how one can build up a log and the starting point for the reflections can be got from some chosen intentions. The experimental testing of the chosen log was carried out during the field work for my PhD thesis and this shows how one can use a log in practice to systemize the researcher's ethical reflections in a good way.

The advantage of writing down events and reflections from the field work in a self-reflecting log is that one discovers solutions to challenges along the way. It is as Kversøy (2005) writes that to reflect is to blow the dust of habitual thinking. One challenges habitual thoughts through a conversation with oneself. The solutions that appear contribute to ensuring better interaction between me as a researcher and the different teachers and pupils. The log's focus on individual events and how they were handled in relation to the selected intentions, made me more conscious as a researcher over how I act towards others, how I have influenced the field, what I had access to and what I did not have access to. In addition the log has made it easier for others to understand my choices as a researcher during the process. Alver and Øyen's (2007) description that an ethical reflection is an integrated part of everyday work during the research work was only reinforced during my own study. The intentions of wanting the best for everyone, openness of mind and phenomenological respect have been important as regards my pre-understanding that has been influenced by many years as a vocational educationalist and special educationalist. Being a part of a new and unknown working environment has given me the possibility to challenge my own understanding. In this respect the log has also been very important. My choices of the intentions have governed my focus on my research morals. My eyes have been directed towards these choices. One could have achieved the same results or better by making other choices. But the intention was to create good relationships and good interaction for all the parties through reflection over one's research morals.

References

- Alver, B. og Øyen, Ø. (2007) *Challenges of Research Ethics*. Norway: University of Bergen.
- Brekke, M & Tiller T. (2013) *Læreren som forsker*. Oslo: Universitetsforlaget
- Bjørndal, C.R.P. (2011) *Det vurderende øye*. Oslo: Gyldendal Akademiske
- Dewey, J. (2007) *Democracy and Education*. Teddington: The Echo Library
- Grendstad, N. (2007) *Å lære er å oppdage*. Oslo: Didakta Norsk Forlag as.
- Halkier, B. (2010) *Fokusgrupper*. Oslo: Gyldendal Akademiske
- Hartviksen, M. & Kversøy, K. (2008) *Samarbeid og konflikt*. Bergen: Fagbokforlaget
- Hiim, H. (2013) *Praksisbasert yrkesutdanning*. Oslo: Gyldendal Akademiske
- Holstein, J. & Gubrium, J. (1995) *The active interview*. London: SAGE Publications
- Kalleberg, R. (2009) *Samfunnsvitenskapenes oppgaver, arbeidsmåter og grunnlagsproblemer*. Oslo: Gyldendal Akademiske
- Kemmis, S. (1998) *Action Research in Practice*. New York: Routledge
- Kvale, S. og Brinkmann, S. (2009). *Det kvalitative forskningsintervju*. Oslo: Gyldendal Norsk Forlag a.s.
- Kversøy, K. (2005). *Etikk – en praktisk vinkling*. Bergen: Fagbokforlaget
- Postholm, M. & Moen, T. (2009). *Forsknings- og utviklingsarbeid i skolen*. Oslo: Universitetsforlaget a.s.
- Tjora, A (2012) *Kvalitative forskningsmetoder i praksis*. Oslo: Gyldendal Akademiske
- Tranøy, K.E. (1986). *Vitenskapen – samfunnsmakt og livsform*. Oslo: Universitetsforlaget a.s.
- Tranøy, K.E. (2001). *Det åpne sinn*. Oslo: Universitetsforlaget a.s.
- www.etikkom.no/no/Forskningsetikk 2009

FLIPP STATISTIC COURSES!

Andrea Breitenbach

Institute of Sociology, Goethe University Frankfurt (Germany)

Abstract

Statistics is a branch of mathematics which plays a central role in many fields of study, including the social sciences. However, many students attend statistic courses filled more with horror than with joy. In addition, failing the (these) course often leads to dropping out. This concept attempts, with a combination of different teaching methods, to constantly improve the statistics courses and to increase the quality of its teaching at the Faculty of Social Sciences at the Goethe University. A key component is the analysis of didactic concepts and expert interviews.

An expert in the Didactics of Mathematics Prof. Dr. Spannagel is known in Germany as a pioneer of Flipped Classrooms. In an interview with him, he explained the Flipped Classroom method, and sparked my interest. Now that new teaching methods and e-learning elements, such as “active plenum”, have proved for some time to be successful, it seemed time to test the Flipped Classroom.

Instead of frontal teaching, learning interface videos are made available as preparation for the course. The seminars give students the chance to work with others to, for example, solve tasks, discuss, etc. In addition, the learning platform records the meetings, the numerous exercises and self-tests.

The experience from sessions held to date shows that seminar participants arrive well prepared, having learnt the main course content independently through the video. In the seminar, the material is more intensely practised with further examples and exercises. Qualitative interviews and repeated evaluations including before and after testing are used to evaluate the effectiveness of the concept.

Keywords: *Didactics of Statistics, innovative teaching methods, Flipped Classroom, Improvement of teaching, Inverted Classroom.s*

1. Introduction

Courses about methods of quantitative social research, especially statistics, are visited by students with a feeling of fear rather than joy. In addition, non-attendance leads to the breaking up of the studies; at the same time it is known that the increasing the quality of teaching can contribute to a decrease in the dropout rate. (Baumert & Kunter, 2006: 492 f; Schiefele, Streblow, & Brinkmann, 2007:129, 135ff). In order to improve the statistics lectures, make them more demonstrative, and to improve the teaching quality, this work aims to create an experience-orientated course. The main focus of this work is to develop a new concept for the lecture “descriptive statistic” through educational concepts, based on the mathematics, ‘eLearning-Didactic’ and expert interviews. It will aim to implement new teaching methods and create additional learning opportunities.

In a conversation with Professor Spannagel, one of the flipped classroom pioneers in Germany, he explained a concept which caught my interest. Instead of holding lectures through teacher-centred, ‘frontal’ teaching, students can find videos to prepare for the course or as homework, for all seminar topics. In the attendance phase, students are able to meet up with the lecturer in order to ask questions regarding the videos, discuss and compile the exercises.

But why is this method more useful than lecture-style teaching, and what are its advantages? Mr Spannagel explains this question clearly. “When I hold a lecture, then everybody has to follow me at the same pace. At this stage, there is no such thing as individual learning pace, personalisation and internal differentiation etc. Noo! Everybody has to follow submissively at the same pace. If anybody steps out in between: that is his own loss! This means that he basically has to get over it and try to understand it at home. Would it not be better if the student is able to remind or pause the lecture of the professor in case he needs more time to rethink matters” (Spannagel, 2011b).

In past semesters, eLearning components and the new didactics elements were successfully implemented. In order to take the next step forward and to get away from lecture-style teaching, it was about time to try out the flipped classroom.

2. Methods

For the development of new teaching concepts, a few steps are undertaken: to begin with, the didactic concepts are analysed, which include the opinions of experts. Based on this, new teaching concepts can be developed, which need to be continually evaluated thereafter, on many levels.

2.1. Didactic concepts und expert interviews

To create a theoretical foundation, didactic concepts from mathematics didactics, university didactics and eLearning didactics, are being reviewed and verified as to whether they can be transferred to the statistics lectures. As in this report, the focus is on the flipped classroom concept, and not all didactic concepts can be included at this stage. Only the main elements are reviewed, which can then be applied in lectures.

One of the central aims of the didactic concept, is to create an additional benefit, in comparison to the traditional teaching methods. In the statistic lectures, major events are common, which are hardly accomplishable without the lecture-style teaching. However, through this type of learning, students can only learn factual knowledge, whilst social skills and personal organisation of learning is neglected.

The authority of the lecturer is foremost, and a democratic teaching style becomes less of a priority. Moreover, the individuality of each attendee and his individual learning pace is not taken into account, despite there being numerous types of learners. “No educational comprehension is focused on autonomy, self-determination, majority, the ability to self-reflect and identity winning, rather it is focused on the measured shift of status quo.” (Aschersleben, 2002: 40ff; Gudjons, 2011: 32). At this point exactly, the flipped classroom comes into play, which according to Reinmann aims to change and dissolve the internal systematic structure within the lectures (Reinmann, 2011: 7); different forms of knowledge can be generated, because, instead of pure and absolute lecture-style teaching, there is time for several learning methods that mobilizes students, which leads to a re-evaluation of quality in the initial period, and an increase in value in this attendance phase (for more information see: (Handke & Schäfer, 2012)).

Studying with videos brings several benefits: the recordings are available at any time at any given place; one can pause and take note; one can watch parts several times etc. Moreover, studying with videos promotes self-directed and autonomous learning, which is necessary in later life, particularly in careers. Even though the benefits outweigh the disadvantages, they should not be neglected; watching videos is also frontal, without the opportunity for immediate feedback or critical questions. In addition, the attendees require the availability of a fast internet connection, and need to motivate themselves to watch the videos. Some disadvantages can, to a certain extent, be compensated for with appropriate methods, such as exercises to accompany the videos or question sheets. (Bergmann & Sams, 2012b: 20ff; Handke & Schäfer, 2012: 13ff, 26ff).

Other elements which are applicable to be used the seminars, are exercises and the active plenum. Exercises are an important element, for example, in the form of group work or exercise tutorials, as well as small projects, for both independent studies, and conceptual and procedural knowledge. Furthermore, exercises in statistics are central to success in learning, a fact illustrated by various outcomes. According to Bales [10], practical exercises led to an effectiveness in learning to 75 % – only working something out by themselves (implementation of own scientific research projects for example) led to a higher effectiveness (80%) ((Bales, 1996) cited from (Wildt, 2009)). Exercises should therefore play a central role, especially in the fields of research methods and statistics (Bales, 1996; Borneleit, 2013; Storz, 2009; Weigand, 2013; Zech, 1996)

In the active plenary method, targets are solved by the students together (at lecture hall): The lecturer sets a target, which is to be solved by the students in the course. One to three students go up to the board to act as moderators and the lecturer goes, for example, up the lecture hall. The moderators receive suggestions from the other students and write them as solutions on the board. The advantage over phases, which are moderated by the lecturer, is that students often dare to express and discuss together their understanding of problems and ambiguities. “It is assumed that for the purposes of the process-oriented teaching-learning situations in particular processes such as reasoning, communication and problem solving are promoted here. The lecturer stays in the background and only intervenes in critical situations or when needed. This method is particularly dealt productively with errors ... and that students gain with a low mathematical sense of competence (self-efficacy) more confidence in their own abilities” Essential for this approach is the assumption of networked and process-oriented learning, which is represented by the methodologists of “learning by teaching” (Spannagel, 2011a, 2014).

To guarantee the quality of the videos, obtain suggestions for seminar design and improve teaching, expert interviews were conducted with two Mathematics lecturers, in advance. In addition, there is a continuous discussion with users of this concept.

2.2. Didactic scenario: videos and plenary session

The statistic course is designed as a "Flipped Classroom": Bergmann and Sams described the concept of flipped classrooms as follows: „Flipped learning is when educators actively transfer the responsibility and ownership of learning to their students. It happens when the teacher's lecture is delivered to students via video outside of the classroom. Then traditional class time is used for active problem solving and one-to-one or small group tutoring with the teacher. The flipped class allows teachers to have more face-to-face time with students, fosters real differentiated or personalized learning, challenges students to take responsibility for their learning, and allows students to master material at their own pace” (Bergmann & Sams, 2012a).

The statistic course is designed as a "Flipped Classroom": Bergmann and Sams described the concept of flipped classrooms as follows: „Flipped learning is when educators actively transfer the responsibility and ownership of learning to their students. It happens when the teacher's lecture is delivered to students via video outside of the classroom. Then traditional class time is used for active problem solving and one-to-one or small group tutoring with the teacher. The flipped class allows teachers to have more face-to-face time with students, fosters real differentiated or personalized learning, challenges students to take responsibility for their learning, and allows students to master material at their own pace” (Bergmann & Sams, 2012a).

Instead of performing the statistics course in the form of frontal teaching, videos (30 minutes per subject) are available on the e-learning platform, to prepare and have ready all the seminar topics for the course or as homework. In the upcoming week, students have to prepare for the plenary/assembly session by watching the videos. In the subsequent attendance phase, students meet in the conference room as an plenum, with the teacher, ask questions about the videos, discuss and work together on exercises. Further issues are resolved in group work and then discussed together. The active plenary is established simultaneously; this method has already been implemented successfully in other courses.

Due to this diversity of methods and relocation of the lecture-style teaching into a plenum, complex content can be discussed and developed within the group. Valuable time that is not used extensively enough in lectures, can then be used for exercises and discussion. Studying and discussions done together promotes acquisition of knowledge and involves the students more intensively.

In subsequent meetings, the application of what is learned is practiced in small-scale research projects (secondary data analysis) on the computer, and as a voluntary offer, tutors are available to help with the project work and additional lectures. Furthermore, the attendance lecture is complemented by material and links to the e-Learning platform, tutorials and exercises with solutions and sample solutions. In addition, the tutor collects questions relating to the video or the meeting, which are then discussed afterwards via email or in the next seminar. tutor collects by to and during the course, which will be discussed by mail or in the seminar. In summary, the variety of methods are suitable for different learning types.

2.3. Questionnaire design and evaluation

To evaluate of the concept, a separate questionnaire has been developed, to collect the opinions of the attendees, at three different time points. It will determine the motivation, expectations of the courses (including e-learning offers) and knowledge of students. At the end of the semester, the teaching methods and the e-learning offers are going to be evaluated. This knowledge serves for the test and improvement of teaching and the e-learning offer. Furthermore the seminar will be evaluated by the university once in the semester.

In order to question the growth of knowledge, four calculational tasks have been compiled, measured at two times, with a logic test serving as a control, where the answers should not be better in the second measurement. Furthermore, self-efficiency, high school mathematics grade, exam grades, complexity of the material and fear of statistics were available as third variable controls. Using various analytic methods such as non-parametric tests and the panel regression, analysis of the data is performed. In addition, qualitative interviews with participants are undertaken alongside evaluation of continual improvement of the system and the videos.

3. Results and Discussion

The experiences from the meetings and self-assessment shows that the seminar attendees come well prepared in the course and the major content can be independently learned through the videos. In the

lectures, the content becomes more intense, based on several examples and increased calculation exercises. Exercises are now more expected. In order to review whether successful learning has been improved, panel analysis is carried out, the results of which are not yet known. However, if you compare the last two winter semesters, there is a marked improvement of grades shown through non-parametric tests, as one can see that the grade point average increases from 2,8 to 2,4 and the median grade increases from 2,7 to 2,3. The groups can be compared in both the written examination requirements as well as feedback from research projects.

The analysis of the videos indicates that the videos are watched in a balanced way. These are signs that the topics are being studied and only a few students give up their studies, therefore it can be said that the quality can be evaluated as good. This assumption is reflected in the feedback of the videos, which are rated from very good till good (grade point average 1,52, median and mode 1, standard deviation 0,79).

In order to test an experimental design, the research projects of only one group of students was asked to be made available, and was compared for evaluation together. The two show important results, at a significance level of 10%, that the video group was 1,5 points better than the comparison group.

Based on qualitative interviews and the analysis of the open questionnaires, a very positive response was received: "I like the seminar concept for statistics very much"; "So I think that it is very positive simply for the reason that one has to function through the media establishment, that you wait - depending on - one can see the points again, that is to say, this really is for everyone...and it cannot be too fast, so to speak"; "I think it is really good and I find it very comfortable"; "Flipped Classroom is a super model!"

4. Conclusion

Based on the results of the evaluation, and also by self-assessment, it seems that statistics courses can be made more clear and effective. A combination of different social forms and new, activating teaching methods helps in that students learn more and achieve better results. In particular, exercise elements and practical work (MiFos) promote effective learning and application of what has been learned. Evaluations and scoring during the semester also promote continuous work and curb only learning facts for the end-of-semester exams.

F.E. the active plenum helps in making even less motivated and weaker students to speak up. A major advantage of this method is to thereby obtain the perspective of the students. Different methods are in turn used to improve the design course. Overall, it is clear that a combination of different methods represent a profit for both the learner and for the teacher and thus help to improve the statistics courses.

References

- Aschersleben, K. (2002). Lob des Frontalunterrichts? In G. Brinek & A. Schirlbauer (Eds.), *Lob der Schule* (pp. 37-49). Wien: WUV-Univ.-Verl.
- Bales, E. (1996). Corporate Universities Versus Traditional Universities. Keynote at the Conference on innovative practices in Business Education. . Orlando, Florida. .
- Baumert, J., & Kunter, M. (2006). Professionelle Kompetenz von Lehrkräften. *Zeitschrift für Erziehungswissenschaften*, 4, 469-520.
- Bergmann, J., & Sams, A. (2012a). ASCD Webinars - Flipped Classroom Webinar Series Retrieved 24.03.2015, from <http://www.scoop.it/t/teaching-innovation>
- Bergmann, J., & Sams, A. (2012b). *Flip Your Classroom: Reach Every Student in Every Class Every Day*. Eugene, Washington: ASCD Alexandria.
- Borneleit, P. (Producer). (2013). Skript: Didaktik der Mathematik. Retrieved from <http://absolutmarcus.de/Downloads/Didaktik%20Mathematik/Skript%20Didaktik%20der%20Mathematik.pdf> 19.07.2013
- Gudjons, H. (2011). *Frontalunterricht – neu entdeckt. Integration in offene Unterrichtsformen*. Bad Heilbrunn: Klinkhardt Verlag.
- Handke, J., & Schäfer, A. M. (2012). *E-Learning, E-Teaching und E-Assesment in der Hochschullehre. Eine Anleitung*. München: Oldenbourg Verlag.
- Reinmann, G. (2011). *Vorlesungen: Abschaffen oder besser verpacken?* Redemanuskript Nov. Frankfurt. Vortrag auf dem Symposium zur Lehre: Zukunft von Großveranstaltungen. Frankfurt.
- Schiefele, U., Streblow, L., & Brinkmann, J. (2007). Aussteigen oder Durchhalten. Was unterscheidet Studienabbrecher von anderen Studierenden? *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie*, 39(3), 127–140.

- Spannagel, C. (2011a). Das aktive Plenum. Neue didaktische Potentiale einer klassischen Sozialform. In L. Berger, J. Grzega & C. Spannagel (Eds.), Lernen durch Lehren im Fokus - Berichte von LdL-Einsteigern und LdL-Experten. (pp. 97-106). Berlin: epubli.
- Spannagel, C. (2011b). Die umgedrehte Mathematikvorlesung Retrieved 23.03.2015, from <https://cspannagel.wordpress.com/category/hochschuldidaktik/>
- Spannagel, C. (2014). Thema für eine Wissenschaftliche Hausarbeit. Das Aktive Plenum im Mathematikunterricht. http://www.ph-heidelberg.de/wp/spannagel/wiha/03_AktivesPlenum_Unterricht.pdf
- Storz, R. (2009). Fachdidaktik-Seminar Mathematik. Berlin: Pro Business.
- Weigand, H.-G. (Producer). (2013). Didaktische Prinzipien. Retrieved from http://www.didaktik.mathematik.uni-wuerzburg.de/fileadmin/10040500/dokumente/Texte_zu_Grundfragen/weigand_didaktische_prinzipien.pdf 19.07.2013
- Wildt, J. (2009). Aktives Lernen in Veranstaltungen mit größerer Teilnehmerzahl. Vortrag an der Universität Greifswald, 26.10.2009.
- Zech, F. (1996). Grundkurs Mathematikdidaktik: Theoretische und praktische Anleitungen für das Lehren und Lernen von Mathematik. Weinheim: Beltz.

INTERACTIVE FRENCH LANGUAGE TEACHING THROUGH FILMS

Canan Aydınbek

French Language Teaching Department, Anadolu University/Eskişehir (Turkey)

Abstract

In Foreign/Second Language Teaching field, instructors need a media that can represent the target language and its culture. Films as authentic and audio-visual materials present many advantages when teachers are able to design activities in terms of the objectives of instruction. According to communicative approach, the main goal of the instruction is to teach to communicate with others in L2. Therefore the interaction between learners is a key concept that allows learners to negotiate the meaning. Since French films provide to learners the social context in which the L2 is used, they facilitate access to the meaning of dialogues. The aim of this study is to raise awareness about the usage of films in teaching French language and to give some ideas about the integration of films in the language classroom.

Keywords: *authentic materials, using French films, teaching interaction through films*

1. Introduction

Communicative language teaching is a meaning-based and learner-centered approach that emphasizes the comprehension and production of messages. In this approach, fluency is more important than language forms and accuracy. As traditional classroom practices have proved, learning solely syntactic and grammatical rules of foreign language (L2) doesn't allow learners to use them in order to communicate outside the classroom. Therefore, teaching how to use the language effectively and appropriately is considered as a vital part of L2 instruction. According to communicative approach (CA), one of the most important concepts is "communicative competence" that consists of some combination of four components: linguistic, sociolinguistic, discourse, and strategic. "Consequently, the concern for teaching linguistic competence has widened to include **communicative competence**, the socially appropriate use of language, and the methods reflect this shift from form to function" (Paulston, 1992).

2. The use of authentic materials in L2 instruction

A written or oral text is usually considered as an authentic material if it is used in a real-life communication and if it is not produced only for language teaching-learning purposes. Nunan (1999) defines authentic materials as "samples of spoken and written language that have not been specifically written for the purposes of teaching language".

Authentic language teaching materials are valuable sources that offer many advantages to the learners. First of all, they give different opportunities for exposure to L2. Learners might discover various dialects of L2 and the different aspects of target culture at the same time because this kind of materials provides information on the life and habits of the people speaking L2. Moreover, authentic materials motivate learners inasmuch as they can connect the real use of L2 with outside the classroom settings. Thus, "regularly providing students at all levels with this kind of opportunity as a supplement to the usual class routine would be an incredible motivator" (Melvin, Stout, 1987: 45).

Exposure to all types of authentic materials provides also a context within which the target language can be situated, and maximizes the chances that learners will encounter items in different contexts. Consequently, learners might realize the differences between formal and informal language. "Fully exploited authentic texts give students direct access to the culture, and help them use the new language authentically themselves and communicate meaning in meaningful situations rather than for demonstrating knowledge of a grammar point or a lexical item" (Melvin, Staout, 1987: 44). However it should be noted that, authentic materials do not replace the course, but it must be integrated into a teaching method. As Nunan says, "learners should be fed as rich a diet of authentic data as possible,

because, ultimately, if they only encounter contrived dialogs and listening texts, their task will be made more difficult” (Nunan, 1999: 27).

Today authentic materials are easy to access for L2 teachers and they can be extracted from many different technological sources such as TV, radio, CDs, and usually via the Internet. But as a raw document, this kind of materials does not have a didactic structure itself. “Taking full advantage of the potential benefits of authentic materials may, however, require both a change of perspective and the adoption of some new approaches” (Melvin, Stout, 1987: 44). As a result, teachers must learn to select materials appropriate to the specific needs of learners and the objectives of the course.

3. The use of French films in French language teaching

In the digital age, films are such valuable and rich resources for teaching language, because they present the use of L2 in real life contexts rather than artificial classroom settings. The abundant exposure to L2 not only facilitates learners' listening training, but also raises awareness of pragmatics as an essential component of communicative competence. The use of films provides many advantages for L2 teachers and learners. A study carried out by Chapple and Curtis (2000), emphasized the motivating feature of using films in content-based EFL instruction. In addition to their communicative and motivating values, films provide to learners a rich linguistic and cultural content that offer linguistic diversities and paralinguistic information. Some studies conducted by Ryan (1998), Heffernan (2005), and Gebhardt (2004) (cited in Bahrani & Tam, 2012), focus on enhancing motivation through the use of films in language classrooms. Unlike the previous studies, the findings of the study conducted by Bahrani and Tam (2012) have supported the empirical evidence pointing the positive pedagogical effect of exposure to films on language proficiency.

Sturm (2012) noted that “film in target language is an efficient and effective link to the target culture(s) in that it is highly visual; it is authentic in that it is made for the target culture audience; it is readily available; and it is attractive to students accustomed to a multimedia environment”.

4. Interactive Language Teaching

The acquisition of communicative competence is the main goal of communicative approach. As we all know, interaction is the essential part of communication. “Interaction is the collaborative exchange of thoughts, feelings, or ideas between two or more people resulting in a reciprocal effect on each other” (Brown, 1994: 159). Therefore, one of the best ways of teaching/learning communicative competence seems to be to teach/learn to interact with others in L2.

Linguistic interaction involves conveying and receiving messages in a context of situation. The meaning of messages is interpreted by participants through the interaction “in a context, physical or experiential, with nonverbal cues adding aspects of meaning beyond the verbal. All of these factors should be present as students learn to communicate: listening to others, talking with others, negotiating meaning in a shared context” (Rivers, 1987: 4).

To encourage learners to express and understand original messages, classroom activities must be designed to that end. From this perspective, films give learners some topics to discuss and communicate about. “Only during interaction with the model- reflecting, verifying, clarifying, asking questions, consulting classmates about it- does the language begin to make sense” (Price, 1987: 157). Moreover, the fact that films provide a great amount of linguistic, non-verbal and cross-cultural information facilitate the acquisition of L2 as it is used in real life context.

5. Learning Activities Based on Films

5.1. The selection of materials

Teachers have sometimes hesitations about film selection as to “Should they show a feature-length film or an excerpt or a film with or without subtitles? Which way will benefit their students most?” The answer is that each one makes his/her decision depending on the teaching objectives and the properties of the group of learners. Films become enjoyable learning materials only when teachers provide well-structured tasks and activities that stimulate learners to use L2 in similar conditions of real communication.

The most important criterion for selection of film is content. The story told in the film must interest learners in order to bring the topic to life and please the majority of the class. The comprehensibility is another important criterion for selection. Linguistic complexity of the dialogs must be more or less close to the level of the students. It is important to choose scenes that present dialogues

with appropriate speech samples and comprehensible accent, and with abundant visual support, clear picture and sound.

It is also important to choose a film that illustrates the linguistic concepts or cultural themes to be studied. Movies that contain scenes of violence, nudity or negative images from a pedagogical point of view must be avoided. In addition, the time available in the classroom should be sufficient for viewing the film and for doing learning activities.

5.2. Some examples of film based activities

1- The whole film approach: after watching a film, learners discuss about the topic in the classroom. This way of exploitation of feature movies is very usual in L2 instruction and it is more feasible in advanced classes than with beginner level learners. However, for the comprehension of events presented in the film, it is better to do some pre-watching and post-watching activities before discussion. The discussion might be organized in form of TV debates. Learners are divided into two or three groups and each group defends his opinions. Some learners should lead the debate. At the end, learners must agree on some issues and explain the conclusions of the debate.

2- Using excerpts or a single scene: film excerpts might be used for oral expression and/or comprehension. Teacher view the sequence without sound and ask learners to imagine the dialogs. Before this activity, teacher should give the information about the characters, their relation with each other and other factors of the situation of communication such as the time, place and the content of the dialogues. In another version of this activity, the teacher plays only the sound of the excerpt with a black screen and asks learners to imagine what might be happening. This type of activities allows learners to understand the relation between the linguistic content (sentences) and the elements of the situation of communication. (The interlocutors: who is talking to who? When? Why? About what? For which purposes?)

3- Completing the story: The teacher views only the half of the film and asks learners to guess what might happen at the end. It is also possible to view only the end of the film and the beginning is to be imagined by learners. Other version of this activity is to view the beginning and the end of the film and to ask learners to fill the missing parts. The teacher could also choose a scene and ask learners to imagine what will happen in the next scene. Learners work in pair or small groups and each group explains his hypotheses about the next scene. Finally, they decide together the group that has found the events that are similar to those of the next scene.

4- Work on intonation and stress: the teacher chooses a sequence that contains conversations with different intonations. He/she gives the transcription of the dialogues to the learners and explains in detail the mood in which the characters speak (are they angry, anxious, happy, upset? etc.) Each learner plays the role of a character, reads and repeats his/her utterances for fifteen minutes in order to speak with appropriate intonation and stress. Next, the teacher views the scene and asks learners to compare the performance of a learner with the speech of the relevant character. After peer critiques, learners play again their roles with the most similar intonation to the original.

5- Simulation: Learners play the role of journalists who ask questions to the actors and actresses. Some learners play the role of artists and that of director, some others play the role of journalists. Everyone should get some information about the character in order to prepare for his/her role. As long as everyone is well prepared, the communication will be so realistic.

6. Conclusion

Films could be motivational teaching materials when used appropriately. The use of films allows learners to identify the elements of situation of communication and to explore the social and cultural aspects of L2. Through films, learners might share their reactions and opinions, talk about many topics, interact among themselves using authentic language. It can be concluded that the use of films in French Language Teaching is beneficial both for teachers and learners in order to acquire competence of communication.

References

- Aydınbeğ, C. (2011). *Le Cinéma: Document Authentique dans l'Enseignement du Français Oral*. Sarrebruck: Editions Universitaires Européennes.
- Bahrani, T., & Tam, S. S. (2012). Informal language learning setting: technology or social interaction? *The Turkish Online Journal of Educational Technology*, 11 (2), 142-149.

- Bahrani, T., Tam, S.S.. (2012). Audiovisual News, Cartoons, and Films as sources of Authentic Language Input and Language Proficiency Enhancement, *TOJET*, 11 (4), 56-64.
- Brown, H. D. (1994). *Teaching by Principles. An Interactive Approach to Language Pedagogy*. New Jersey: Printice-Hall Inc.
- Chapple, L., & Curtis, A. (2000). Content based instruction in Hong Kong: Students responses to films. *System*, 28, 419-433.
- Çakır, İ. (2006). The use of video as an audio-visual material in foreign language teaching classroom. *TOJET*, 5, (4).
- Paulston, C.P. (1992). Introduction: English teaching as a foreign or second language. *Linguistic and Communicative Competence*. Multilingual Matters.
- Price, C. (1987). The use of technology: varying the medium in language teaching. In W. Rivers (ed.) *Interactive Language Teaching*. New York: Cambridge University Press, 155-169.
- King, J. (2002). Using DVD feature films in the EFL classroom. *The Weekly Column*. Article 88. Retrieved 06.05.2015 from <http://www.eltnewsletter.com/back/February2002/art882002.htm>.
- Nunan, D. (1999). *Second Language Teaching and Learning*. Boston: Heinle and Heinle Publishers.
- Melvin, B. S., & Stout, D. F. (1987). Motivating language learners through authentic materials. In W. Rivers (ed.) *Interactive Language Teaching*. New York: Cambridge University Press, 44-56.
- Rivers, W.M. (1987). Interaction as the key to teaching language for communication. In W. Rivers (ed.) *Interactive Language Teaching*. New York: Cambridge University Press, 2-16.
- Sturm, J. L. (2012). Using film in the L2 classroom: A graduate course in film pedagogy. *Foreign Language Annals*, 45, (2), 246-259. DOI: 10.1111/j.1944-9720.2012.01187.x.
- Tuncay, H. (2014). An integrated skills approach using feature movies in EFL at tertiary level. *TOJET*, 13, (1), 56-63.

USING CORPORA TO RAISE HONG KONG STUDENTS' AWARENESS OF APPOPRIATE WORD CHOICE

Adrian Ting

English Language Centre, The Hong Kong Polytechnic University (Hong Kong)

Abstract

When using English, Hong Kong students often make collocation mistakes, for instance, misusing verbs such as to eat drugs rather than to take drugs, and in the case of forming existential clauses, using there have instead of there are. Although Hong Kong students who are proficient in English are more likely to consult a bilingual dictionary (Fan, 2000), their less proficient counterparts tend to rely on direct translations. While first language interference is often the reason why Hong Kong learners make those aforementioned fossilized errors, it is felt that increase use of web based translation devices is partly to blame, as words are often translated literally without providing much explanation on their proper usage in different contexts. Not only do such errors cause confusion at lexical level, they also have an impact on the overall comprehension of written and spoken texts students produce.

This paper reports on the use of corpora in an English language classroom to help raise students' awareness of appropriate word choice. Students who took the Workplace English module were given training on how to use the British National Corpus (BNC). After a series of exercises, students were put in groups to analyse their own texts using the BNC, to check against how words and expressions are commonly used in different situations. The paper concludes that, while the learning curve is steep and that the whole process is time consuming, the use of BNC can be tremendously beneficial to ESL/EFL learners.

Keywords: *Collocation, corpora, language learning, error correction*

CONVERSION OF A WEB APPLICATION FOR GRADUATE SCHOOL ADMINISTRATION INTO A MOBILE WEB APP

David Edelman

The Graduate School, North Carolina State University (United States)

Abstract

North Carolina State University in the United States uses a web application named GSOARS to assist in mentoring masters and doctoral students. The application, which was written to be used on a desktop PC or a laptop, allows an advisor or Directors of Graduate Programs to view the programs, plans, graduate student support plan (tuition and insurance assistance) and the academic progress of the student in completing the student's plan of work. The application also allows the student to enter information in categories such as Publications and Meetings Attended so that the student can produce a CV and the student's department can track statistics for its students in these areas. Finally, the student can submit structured progress reports to which the advisor can respond.

To encourage the usage of this system by both departments and students, it was decided to produce a mobile-friendly version of the application. The mobile web app version of GSOARS was designed to be compatible with any device: desktop, laptop, tablet or smart phone. This required rethinking how information about the student was displayed, since the type of full-page displays that would be acceptable on a desktop system would be unwieldy and discouraging to use on a tablet or cell phone. So, starting from the principle that the display should be not only user-friendly but encouraging to use on any device, the design of the overall application was restructured so that information was organized into smaller, "bite-sized" blocks with self-explanatory and flexible navigation controls.

In this presentation, the design principles used to restructure GSOARS will be discussed. In addition, details on the server (LAMP) and programming language (PHP augmented with jQuery Mobile, an HTML5-based user interface), including the rationale for selecting them, will be discussed. Finally a comparison of the GSOARS web application display with the GSOARS mobile web app display will be shown, illustrating how the design principles were implemented. Also, feedback from the users of the mobile web app currently in production will be discussed, including suggestions for additional features and improvements.

Keywords: *Graduate, administration, mobile, web application.*

1. Introduction

One of the challenges in designing an on-line mentoring system allowing students and advisors to interact is making it user-friendly enough so that both students and advisors will want to use it as opposed to more traditional methods such as office visits, phone calls and email. This especially becomes an issue for graduate schools as the student to advisor ratio increases and the number of distance education students increases.

The Graduate School of North Carolina State University (NC State), located in Raleigh, North Carolina in the United States, first implemented for optional use an on-line advising web application named GSOARS (Graduate Student On-line Advising and Reporting System) which was developed from a system created at the University of Missouri, in 2008 (1). The system as developed at NC State, had three features intended to encourage its use by students and advisors: a method for students to respond to preset questions by their advisors which the advisors could then respond to, a method for students to input data to produce a CV, and a method for advisors and graduate programs to display the full academic history and other information such as publications and research papers presented, both for a single student and for all the students in the program over a requested time period.

To encourage increased usage of the system by both advisors and students, it was decided to migrate GSOARS to work as a mobile web application, so that it could be used on desktop and laptop

systems as well as mobile devices such as tablets and smart phones. This paper discusses issues related to the migration, the current progress of the system and plans for the future.

2. Original Web Design of GSOARS

GSOARS was originally designed to be used on a desktop or laptop PC and consists of three modules which allow information from different sources to appear on a single page. The purpose is to support mentoring of graduate students by providing feedback in both directions between a student and the student's advisors. The program can also provide statistical reports on the students in the program in categories such as publications and conferences attended.

The first module is the student search system, which allows advisors and administrators to search for a student by name or University login ID (Unity ID) to obtain comprehensive information about the student: contact information, demographics, program and plan, plan of work, courses taken at NC State, and the student's eligibility for the Graduate Student Support Plan (GSSP) which provides tuition assistance and medical insurance for graduate students. The module accesses information stored in the PeopleSoft Student Information System, an Oracle database.

The second module is student information entry, which allows student to enter and store information about activities related to their academic program. These include (based upon major program) categories including art/design, awards/honors, clinic & lab experience, conferences, current research, education (outside of NC State), employment, fellowships, grants, license/certification, presentations, professional organizations, publications, research interests, service/internship, stipend support, student organizations, teaching experience and other skills not covered by the previous categories. The data from this module can be output as a personalized Curriculum Vitae (CV) or in an overview form which could be used as part of a resume.

The third module, the progress report workflow, allows the student to submit a formatted progress report to the advisor, members of the student's Plan of Work Committee, and the Director of Graduate Program for the student's program. The advisor or committee members can then reply to the student's progress report to discuss pertinent issues. This workflow is stored so that there is a permanent record of all communication in GSOARS between students and advisors that is available to both parties.

3. Objectives for Migration to a Mobile Web App

Since the use of GSOARS by graduate programs is optional, we wish to enhance its features to increase usage by the programs. One way to do this is to migrate to a mobile web application. The mobile web application will work equally well on a desktop, laptop or mobile system, sensing the type of device being used and modifying the output page accordingly. One of the principles we have developed during the design phase was "One Idea per Page", or OIPP, for mobile devices. An idea can be defined as a group of interrelated attributes of an object that optimally should be presented together. For example, the idea "program description" for a student would include the student's degree, program name, plan name, plan type, subplan (if any) and program status. All of the attributes of one idea would appear on a single mobile app page along with a navigation menu.

Figure 1 shows a section of the GSOARS output for the student search module for a desktop device. The output appears on one page which can be scrolled vertically. The amount of information displayed is so extensive that it is not ideal for the smaller screen used in tablets and smartphones. By using OIPP, we can break down the information displayed on the page into separate "ideas", each of which would appear on a separate page easily reached by choosing from a navigation bar which can either be reduced to icon or displayed in full along the left side of the mobile device. Table 1 shows the OIPP diagram which illustrates how each module can be synthesized into "ideas" each of which become individual entry/view pages or summary pages in the application. Figure 2 shows a screen capture from a section of a tablet screen for the student search module, displaying the navigation menu on the left and Plan of Work information on a particular student in the body of the page.

4. Technical features of the Web App

The web application is hosted on a LAMP server, using PHP augmented with jQuery Mobile, an HTML5-based user interface. This configuration was used because PHP is a flexible language suitable for mobile development and is especially useful for rapid prototype development. jQuery Mobile is a popular interface which has proven quick and reliable on many mobile web applications.

5. Current Status and Plans for the Future

The student search module is now available as a mobile web app and has been used by advisors and administrators since early 2015. The feedback has been very positive with many of the users preferring the mobile output format to the original desktop format. We have found that face-to-face meetings with the stakeholders (students and advisors) are useful to encourage use of the system. We now plan to complete the migration of the other two modules by the fall semester of 2016.

Figure 1. GSOARS desktop screen view

NC STATE UNIVERSITY **GSOARS - The Graduate Student Online Advising and Reporting System** [Logout](#)

David Edelman
Faculty/Staff | Graduate School

Students **My Information** **Summary Reports** **Settings**

Student Search & My Advisees

- Accounting - MR
- Adult & Community College Educ - EDD
- Adult & Community College Educ - MS
- Aerospace Engineering - MS
- Aerospace Engineering - PHD
- Agricultural & Extension Educ - EDD
- Art and Design - MR
- Biochemistry - MR
- Biological & Agri Engineering - MR
- Biological & Agri Engineering - MS
- Biological & Agri Engineering - PHD
- Biomathematics - MR
- Biomathematics - MS
- Biomathematics - PHD
- Business Administration - MR
- Business Administration - MR
- Chemical Engineering - MR
- Chemical Engineering - MS
- Chemical Engineering - PHD
- Chemistry - MR
- Chemistry - MS
- Chemistry - PHD
- Civil Engineering - MR
- Civil Engineering - MS
- Civil Engineering - PHD

Christina Kamon Hester
Unity ID: ckhester
Emplid: 000117133

Campus Community

Email and Phone		Citizenship and Visa	
Email	ckhester@ncsu.edu	Country of Citizenship	United States
Phone	919/513-0571	Citizenship Status	N/A
Local Address		Visa Permit Type	N/A
Line 1	121 Colleton Rd	Visa Effective Date	N/A
City, State, Zip	Raleigh, NC, 27610, USA	Visa Permit Status	N/A
Gender and Ethnicity			
Gender	Female		
Ethnicity	White Asian		

[View Comments](#)

Academic Program/Plan/Subplan

Degree	Program Descr	Plan	Plan Descr	Plan Type	Subplan	Program Status
CTG	Graduate Certificate	13CEDCTG	Counselor Education-CTG			Active
MED	College Couns & Student Devel	13CESMED	Coll Couns & Student Dev-MED	Major		Active

Advisors

Name	Emplid	Role
Ting Siu-Man	000010366	Advisor

SIS Milestones

Milestone	Status	Date	Level
MR Option B Requirements			
Phi Kappa Phi	Completed		

SIS Checklists

Table 1. OIPP Map for Creation of Individual Mobile Web App Pages

GSOARS Module	Individual Mobile Web App Page
Student Information Entry	Art/Design
	Award/Honors
	Clinic & Lab Experience
	Conferences
	Current Research
	Education (Outside of NC State)
	Employment
	Fellowship
	Grants
	License/Certificate
	Other Skills
	Presentations
	Professional Organizations
	Publications
	Research Interests
	Service/Internship
	Stipend Support
	Student Organizations
	Teaching Experience
	CV Creator
	Overview Creator
	Student Capability Overview (for advisors)
Student Search	Contact Information & Demographics
	Program, Plan and Subplan
	Plan of Work
	Courses Taken at NC State
	Graduate Student Support Plan (GSSP)
	Comprehensive Report Creator
Progress Report Workflow	Student Response Interface
	Advisor Response Interface
	Response Template Creator
	Progress Report Status (for advisors)

Figure 2. GSOARS mobile screen view

New Search

Campus Community

Academic Program

Advisors

Milestones

Plan of Work

Course History

Academic Load

GSSP

Program Requirements

Menu

Christina Kamon Hester

Plan of Work and Committee Members for ACAD PLAN = 13CESMED

Course Description	Course Prefix	Course Nbr	Units	Term
Research Applications in C&I			0	
Stat Behavio Sci I	ST	507	3	2010 Fall Term
Theories & Techniques Counsel	ECD	530	4	2011 Spring Ter
Cross Cultural Counseling	ECD	525	3	2011 Summer T
Student Dev. in Higher Educ.	ECD	535	4	2011 Fall Term
Group Counseling	ECD	539	3	2012 Fall Term
Spec Problems: Substance Abuse	ECD	590	3	2012 Fall Term
Electives	ECD	540	3	2013 Spring Ter
Spec Problems Clinical Assessm	ECD	560	3	2013 Summer T
Career Counseling & Development	ECD	524	3	2013 Fall Term
Tests & Measurement	PSY	535	3	2013 Fall Term
American College Student	ECD	543	3	2014 Spring Ter
MultiCulti Life Span Dev	EDP	575	3	2014 Summer T
Electives	EAC	559	3	2014 Fall Term
Tech in Counseling	ECD	562	4	2015 Spring Ter
Practicum in Counseling	ECD	642	6	2015 Fall Term
Intern College Stud. Dev	ECD	652	9	2016 Spring Ter

Total Number of Units for this GPOW

Member Name	Program Represented	Emplid	Committee Role	Committee Role Accepted

NC STATE UNIVERSITY

References

- (1) Edelman, D. (2011). GSOARS: Structured On-Line Advising for Graduate Students. *ICERI2011 Proceedings*, 2058-2064.

CREATING INCLUSIVE WORKPLACES FOR PERSONS WITH DISABILITIES AS AN INTEGRAL ELEMENT OF DIVERSITY MANAGEMENT

Marzena Wójcik-Augustyniak

*Department of Management and Marketing, Faculty of Economic and Legal Sciences,
Siedlce University of Natural Sciences and Humanities (Poland)*

Abstract

According to the European Disability Strategy (2010-2020), which is based on an effective implementation of the United Nations Convention on the Rights of Persons with Disabilities and the Europe 2020 Strategy, the European Charter of Fundamental Rights, the Lisbon Treaty, one should take actions which help to increase participation of persons with disabilities in the society and economy, and enable them to fully exercise their rights. In order to foster the inclusion of persons with disabilities, the Commission identified eight areas for a joint action of the EU and the Member States (Accessibility, Participation, Equality, Employment, Education and training, Social protection, Health, External action). Nevertheless, actions taken at the Union's or national level must be supported and implemented at the level of organizations and companies. Company managers must be interested in and aware of the possibilities of employing persons with disabilities. Not only should they know how to manage and help them fully realize their potential, but also be confident that creating workplaces for people with disabilities (PWDs) can be an opportunity both for employees and the whole organization. Due to the fact that managers of organizations are those who make final decisions regarding employment or non-employment of persons with disabilities, their lack of interest and understanding of the benefits of exploiting the potential of PWDs prevents implementation of solutions and improvements in the workplace.

That is why, the main purpose of this paper is not only to propose solutions of creating inclusive workplaces for people with different types of disabilities, but also to present basic assumptions of Diversity Management.

The ERGO WORK Project is presented here as an example of combining theoretical declarations of Persons With Disabilities' (PWDs) inclusion in the workplace with real actions. The Project, which involves a collaboration of 10 partners across 6 European countries (Poland, Slovenia, the UK, Spain, Italy, Belgium), seeks to improve the ergonomic design of jobs and workplaces for persons with disabilities.

The ERGO WORK's 3 main pillars are: HEI-B cooperation ("Knowledge Triangle"), improvement of learning and teaching methods and contents within Ergonomics for more competent, skilled students in the field ("New Skills for New Jobs"), and equal employment opportunities, universal design and quality working environment for all employees, including persons with disabilities ("Social Cohesion").

Finally, the study presents the results of actions undertaken as part of the Project.

Keywords: *Diversity management, inclusive workplaces, PWDs, ERGO WORK Project.*

1. Introduction

The article presents general principles of Diversity Management, the essence of which is the promotion of respect for the variety and specific characteristics of different groups of workers, including but not limited to: employees of different origins (countries, cultures), disabled workers, elderly workers, or employees of other sexual orientation. Said respect is manifested through the creation of working environment and implementing tools (of recruitment, motivation, training) which favor the inclusion and integration, and at the same time, more effectively use the potential of those who have until recently had a smaller chance of active participation in social life.

The article focuses primarily on activities aimed at the inclusion of one of the above groups by creating inclusive workplaces for persons with disabilities.

2. Key principles of Diversity Management

Diversity Management, whereby diversity of the members of organizations is perceived as a valuable chance that ought to be used in management more consciously, has gained popularity over the last decade (Csikszentmihalyi, 1990). Many authors find differences between various groups of workers to be precious management resources, as diversity promotes productivity and creativity. Hence, organizations started to seek recruitment and selection methods that would harmonize with diversity. Consequently, they began to implement training courses oriented at respecting and using differences between particular employee groups. (...) G. Kartón i A.-M. Greene (2000/2007) underline that contemporary Diversity Management is an approach more orientated to organizational benefits resulting from diversity because it assumes that "business interest lies in diversity". The purpose of diversity management is to identify the characteristic features of various groups of workers and treating them as valuable representatives of similar groups in our environment (Kostera, Śliwa, 2010, pp. 309-310).

Some indisputable benefits of diversity management from the point of view of organizations which create an inclusive and harmonious environment is an improvement of their reputation among job seekers, which allows them to attract the best workers on the market. Employees who feel included, valued, and rewarded become more engaged and motivated. In a worldwide survey of 3 million employees on diversity, employee satisfaction and organizational performance, it was found that creating an inclusive and harmonious environment was a key stimulus behind employee engagement and commitment (Pollitt, 2005). Greater employee engagement leads to reduced turnover. A 2008 study by Gallup Management Group in the United States revealed that engaged employees had 51% lower turnover on average (Dernovsek, 2008, p. 42).

3. Inclusive design of workplaces as an element of Diversity Management

It is assumed here that effective Diversity Management with regards to the disabled, the main focus of the author, is possible thanks to, amongst other things, proper workplace design and streamlining. Subject literature also uses another term, Disability Management, which according to the author of this study constitutes an integral part of Diversity Management. If an organization employs disabled persons, it needs to create adequate working conditions in the workplace, which is an object of interest of inclusive design.

In order to understand the relationship between Diversity Management and Inclusive Design, basic definitions of diversity and inclusion will be presented below.

T. Hudson Jordan states that "Anything that makes us unique is part of the definition of diversity in general understanding. Some of differences we are born with and cannot change" but some we acquire in the educational process, when functioning within a society, or, as in the case of disability, as a result of various unfortunate events, or simply of the aging process. Inclusion involves bringing together and harnessing these diverse forces and resources in a way that is beneficial. Inclusion puts the concept and practice of diversity into action by creating an environment of involvement, respect, and connection—where the abundance of ideas, backgrounds, and perspectives are harnessed to create a business value. Organizations need both diversity and inclusion to be successful (Hudson Jordan).

An inclusive environment requires both individual diversity awareness skills and effective organizational systems that support diversity and inclusion. *Inclusive Design* is sometimes used interchangeably with other terms such as: *Universal Design* and *Design for All*, *Co-design*, *People-centered Design*, *User-focused Design* and *Trans-generational Design* (Inclusive Design). Inclusive Design is about making places (workplaces) everyone can use. The way places (workplaces) are designed affects personal ability to move, see, hear, communicate and work effectively. Inclusive design aims at removing barriers that require undue effort and cause separation. It enables everyone to participate equally, confidently, and independently in everyday activities, including work (Fletcher, 2006).

In the context of creating inclusive workplaces, some of assistive technologies, which are the tools for meeting the special needs of employees, should be mentioned here. The most common: glasses, hearing aids, walking frames, wheelchairs, prostheses, such as artificial limbs, augmentative and alternative communication, Braille, screen-reading software, customized telephones, Braille's screen, lowered curbs or wheelchair accessible transportation, allow persons with disabilities to be more effective in the workplace.

Figure 1. Example of Assistive Technology



Nowadays, 3D virtual worlds can also be recognized as inclusive technology thanks to which persons with disabilities can feel more at ease, to be "freed from the constraints of their physicality, even free in various senses of the word" (Topol, 2014, p. 82). According to WHO (WHO, 2014, p. 31) assistive technologies are evolving quickly and include any item, piece of equipment or product, whether it is acquired commercially, modified or customized, that is used to increase, maintain or improve functional capabilities of individuals with disabilities.

4. Basic data on persons with disabilities in Poland

According to the Central Statistical Office of Poland (GUS, 2011), there is one, commonly acknowledged definition of disability. The definition employed by WHO holds that the disabled are persons with long-term decrease in physical, mental, intellectual or sensory fitness, which may limit their full and effective participation in the social life on equal terms when coming across various barriers. In Poland, at least two definitions of the disabled are in common use. The first one stems from legal regulations and corresponds to the legal basis of qualifying an individual as a disabled person. The second one, far more extensive, is applied by GUS for statistical purposes because the statistical definition includes not only legally disabled persons, but also those who declare to have limitations when performing certain actions (the so-called biological disability), even though they do not hold an official certificate of disability.

Table 1. The distribution of the biologically disabled by age, number and groups of conditions/impairments in the year 2011

Details	Total	One condition/impairment							Two conditions/impairments	Three conditions/impairments
		Total	involving movement	involving hearing	involving vision	involving the circulatory system	involving the neurological system	Other		
Total	4217596	2733979	1101781	98981	155433	399298	375299	603188	788326	417155
Economic age groups										
Pre-working age	187026	149636	21689	8856	11541	8232	31699	67619	18195	7508
Working age	1997171	1410829	551447	43978	84336	173130	225353	332585	312914	116784
Mobile	547139	419402	139650	18479	31860	19848	88549	121016	62096	17698
Non-mobile	1450033	991427	411797	25499	52475	153282	136805	211569	250818	99085
Post-working age	2033399	1173514	528646	46147	59556	217936	118246	202983	457217	292863

On the basis of the studies conducted as part of the ERGO WORK Project, it may be concluded that accepted terminology regarding "disability/impairment" used in various countries is different. A stakeholder survey revealed that the term "a disabled person" is considered to be politically incorrect in the United Kingdom, as numerous groups (including the disabled) prefer the "social model" of disability, and thus would rather be called "disabled people". The social model in the other partner states was not known so well; therefore, a "person with disabilities" (PWD) was used to designate the whole project in this bulletin as a term of choice as the best understood expression in all six countries considered (www.ergo-work.eu).

5. ERGO WORK Project - Joining academia and business for new opportunities in creating ERGOnomic WORKplaces

ERGO WORK is a European project seeking to improve the ergonomic design of jobs and workplaces for persons with disabilities. It involves a collaboration of 10 partners across 6 European countries – Poland, Slovenia, the UK, Spain, Italy, and Belgium. It is focused specifically on developing and testing new teaching material around the design of jobs and workplaces for those with disabilities.

The ERGO WORK Project focuses on understanding the barriers of inclusion of persons with disabilities (PWDs) in the workplace and on combating those barriers through education and cooperation between academia and the industry (www.ergo-work.eu).

The initial phase of the ERGO WORK Project was to analyse the needs of the interested parties, including both the fully-fit and the disabled natural persons, enterprises, and schools of higher education, in the field of knowledge about and improvement of workplaces in view of the disabled and the current state of affairs in each of the partner states with respect to the teaching of ergonomics in designing workplaces for disabled workers.

The study was conducted by online questionnaires in 6 partner states (Slovenia, Poland, the UK, Italy, Spain, and Belgium) and a more detailed analysis of the teaching curricula involving Ergonomics, focusing on the teaching curricula in the UK, Slovenia, and Poland, and additional entry data from the remaining three states. The study was a summary of the teaching of Ergonomics in 13 universities, 17 faculties and 6 countries. The programs of courses offered in these institutions were investigated by direct and over-the-phone interviews. We attempted to understand what is needed in order to improve the training of ergonomists with regards to addressing the needs of the disabled in the workplace.

One of the supplementary targets of the Project was to sensitize university students and entrepreneurs participating in Pilot Project (2 in Slovenia and 4 in Poland) to the needs of the disabled, both from the technological (design of tools and machines which would account for their specific needs) and organizational and managerial points of view (designing new workplaces/adapting existing workplaces to the needs of disabled employees).

The investigations identified an additional content that is specifically targeted at understanding and designing for PWD needs and includes:

- Inclusive design – ageing, different abilities, range of capabilities
- Empathic methods of design to raise awareness of students
- Some understanding of an organizational behavior
- Knowledge concerning assistive technology
- Knowledge concerning accessible environments
- Share knowledge about tools for inclusive design
- Include more knowledge about mental health needs – generally, this area is neglected
- Focus on workplace interventions and PWD needs
- Incorporate knowledge from the ‘Occupational Health’ field and/or consider interdisciplinary cooperation

In 2015, Pilot Projects continue to be implemented. The activities which will follow include, inter alia, a design of new workplaces and an introduction to New Work Places for PWDs. As a result of the Project, the ERGO WORK Final International Conference “Ergonomics – opportunity for new human jobs” will be organized by the Faculty of Economic and Legal Sciences of the Siedlce University, with cooperation with Łuksja and Medical and Diagnostic Centre, on 16th September 2015 in Siedlce, Poland.

6. Methods

The article uses the method of a review of internet literature, available either in English or in Polish, in the field of Diversity Management, inclusive design and persons with disabilities. It is also based on information from thematic monographs, journals, and newsletters published under the ERGO WORK Project.

7. Suggestions and Conclusions

Diversity Management is certainly a serious challenge for company management. This is because it is easier and cheaper to manage uniform groups of people than persons of various approaches to work, typically resulting from cultural differences, various worldviews, and often requiring specific improvements or technologies enabling them to work effectively. Thus, we ought to ponder over the benefits of Diversity Management, and these include the following: increased productivity and creativity,

better reputation among job seekers, searching for talents, increased involvement and motivation to work, decreased turnover rate, and consequently, reduced costs of recruitment and training of new employees replacing the old ones.

Now, therefore, it seems obvious that it is desirable that environment (including workplaces) adapts to the varied needs of employees, including disabled workers.

However, to persuade company managers to manage by taking into consideration, or rather using, diversity, a number of different actions must be undertaken. Undoubtedly, one of them is to popularize knowledge about available assistive technologies enabling people with disabilities carry out their duties effectively amongst those in charge of hiring employees, by means of which their potential may be used for the benefit of an organization at a relatively low cost. Furthermore, one should support organization's efforts made for the benefit of adaptation of existing workplaces, by indicating sources of finance necessary for such investment. Another important aspect involves training courses offered to managers or future managers, aiming at sensitizing them to specific needs of various groups of employees and preparing them to manage and use diversity for the good of an organization and employees. Since meeting the needs of persons with disabilities (not just physical, but above all, mental and social), the European Commission in Strategy Europe 2020 has set records, including Social Protection & Social Inclusion, in which "the EU Promotes the active inclusion and full participation of disabled people in society, in line with the EU human rights approach that disability issues. It further emphasizes that "disability is a rights issue and not a matter of discretion. This approach is also at the core of the UN Convention on the Rights of Persons with Disabilities (UNCRPD), to which the EU is a signatory" (ec.europa.eu).

References

- Kostera M., Śliwa M., (2010). *Zarządzanie w XXI wieku. Jakość. Twórczość. Kultura*. Warszawa: Wyd. Akademickie i Profesjonalne.
- Csikszentmihalyi M. (1990). *Flow: The psychology of optima experience*. New York: Harper and Row.
- Kirton G., Greene A.-M. (2000/2007). *The dynamics of managing diversity: A critical approach*. Elsevier.
- Topol P. (2014). Problematyka niepełnosprawności w przestrzeni światów wirtualnych. *Człowiek. Niepełnosprawność. Społeczeństwo*, No 2 (24), pp. 77-89.
- WHO. (2014). Draft WHO global disability action plan 2014-2021: Belter Heath for all people with disability. *Disability – issues, problems, solutions*, No IV (13), pp. 15-41.
- Pollitt D. (2005). *Diversity is About More Than Observing the Letter of the Law: A Climate of Inclusion Benefits Business Performance Human Resource Management International Digest*, Vol. 13.
- Dernovsek D. (2008). Engaged Employees. *Credit Union Magazine*, No 74(5) p. 42,
- Hudson Jordan T. Moving From Diversity to Inclusion. *Profile in Diversity Journal*. April 26, 2015, from: <http://www.diversityjournal.com/1471-moving-from-diversity-to-inclusion/>
- (n.d.). Inclusive Design - a people centered strategy for innovation. April 23, 2015, from: www.inclusivedesign.no/practical-tools/definitions-article56-127.html#sthash.mzm5DODp.dpuf
- Fletcher H. (2006). The principles of inclusive design. (They include you). April 25, 2015, from: <http://webarchive.nationalarchives.gov.uk/20110118095356/http://www.cabe.org.uk/files/the-principles-of-inclusive-design.pdf>
- (n.d.). Persons with disabilities. April 22, 2015, from: <http://ec.europa.eu/social/main.jsp?catId=1137&langId=en>
- GUS (2011). Stan Zdrowia Ludności Polski w 2009 r. April 25, 2015, from: www.stat.gov.pl/gus/5840_658_PLK_HTML.htm;
file:///C:/Documents%20and%20Settings/PC/Moje%20dokumenty/Downloads/definicje_niepelnosprawnosci_prawnej_i_biologicznej.pdf
- www.ergo-work.eu

LINGUISTIC AND CULTURAL CAPITAL AT AN AMERICAN UNIVERSITY IN THE UNITED ARAB EMIRATES: A NARRATIVE CASE STUDY

Dr. Zsuzsanna Mikecz Munday

Department of Writing Studies, American University of Sharjah (United Arab Emirates)

Abstract

This paper investigates the relationship between linguistic and cultural capital and the career opportunities in a globalized professional environment of business graduates of an American University in the United Arab Emirates. This study is original as it addresses an untapped area in education in the UAE. The case studies include the personal narratives of young expatriate Arab business people working in multinational companies. The study was guided by Pierre Bourdieu's cultural reproduction theory (1997, 1983, 1988, 1992, 2001) and examined the respondents' cultural capital in its embodied, objectified, social and institutional form. Cultural capital theory (Bourdieu, Passeron, 1990) demonstrates how culture and education interact and argues that not only students' socioeconomic status, but also their cultural knowledge and behavior have strong influence on their academic and career success. In spite of the rapid economic development in the UAE and the Arabian Gulf countries, there are few studies investigating cultural capital (Beckett-McInroy, 2006; Russell, 1994). In fact, most research has been done in Western countries (The United States, France, the Netherlands, Denmark) and very little research has been focused on minorities and different ethnic groups (DiMaggio, 1982; Pascarella, and Terenzini, 2005; Blackledge, 2001).

Data were gathered through in-depth interviews that focused on respondents' narratives, in particular their educational experiences relating to their employment opportunities and their careers. The study identified cross-cultural applicability to the Bourdieu's cultural reproduction theory; however, some aspects of it had to be redefined due to the UAE's different socio-cultural context. English language and intercultural communication skills were found to be important forms of cultural capital, and there is evidence that English has negatively affected the respondents' Arabic language skills. In addition, there are also differences in terms of objectified and institutionalized cultural capital.

The paper shows the importance of an American university degree as symbolic cultural capital. Not only English language, but also the recognized qualification offers benefits to the holders. Bourdieu claimed that cultural capital that is acquired at home is the most natural and valuable, but evidence shows that cultural capital acquired through education can be equally important to the holders.

Keywords: *Cultural capital, intercultural communication, higher education*

1. Introduction

This paper investigates the relationship between linguistic and cultural capital and the career opportunities in a globalized professional environment of business graduates of an American University in the United Arab Emirates. This study is original as it addresses an untapped area in education in the UAE. The case studies include the personal narratives of young expatriate Arab business people working in multinational companies. The study was guided by Bourdieu's cultural reproduction theory (Bourdieu, 1986, 1992). I examined my respondents' cultural capital in its embodied, objectified, social and institutional form. I also investigated whether English language and a degree from an American university act as cultural capital. My theoretical aim was to build on the existing theory about understanding cultural and linguistic capital as conceptualized within the Bourdieusian tradition. Most of the students enrolled at American universities in the UAE come from affluent families and through their families' socioeconomic standing they enjoy various forms of cultural capital. Since very little research has been done on cultural capital in the Gulf region (Beckett-McInroy, 2006) I wanted to study the relationship between these graduates' cultural capital and their careers, and whether English language and their degrees function as cultural capital.

American higher education has been spreading across the Gulf countries since the 1990's as the United States is widely considered as center of knowledge and producer of research. During the past

decade, the greatest demand in the area of private higher education has been for Western universities with campuses in the UAE catering for all nationalities. The American University of Sharjah is a non-profit, independent, coeducational institution formed on an American model. It receives full accreditation from the Ministry of Higher Education in the UAE and is also independently accredited in the United States. The university offers authentic American education in the Gulf by offering American curriculum, American standard of instruction with an emphasis on individual initiative, active learning and the application of knowledge.

2. Cultural reproduction theory

The most influential proponent of cultural reproduction theory is French sociologist and researcher Pierre Bourdieu. His ideas provide popular framework in understanding inequality in education. Cultural capital theory (Bourdieu, Passeron, 1990) demonstrates how culture and education interact and argues that not only students' socioeconomic status, but also their cultural knowledge and behaviour have strong influence on academic success. Cultural capital is a mechanism where class advantage is passed down from one generation to another. In Bourdieu's cultural reproduction theory, capital is considered far more than material and financial resources. Capital is "defined implicitly as attributes, possessions or qualities of a person or a position exchangeable for goods, services or esteem, exists in many forms: symbolic, cultural, social, or linguistic as well as economic" (DiMaggio, 1979:1463). Although there are different forms of capital, in education cultural capital is most valued. Cultural capital includes styles, tastes, academic credentials, cultural goods, behaviour, language and over time these can be exchanged for social and economic capital. Cultural capital theory is three-fold. It includes parents' stock of cultural capital, their action in transferring cultural capital and children's ability to absorb cultural capital of the home environment and apply it in the "academic market" (Bourdieu, 1977). Since children from different social classes do not have equal access to cultural capital, it contributes to the preservation of power relations across generations.

The values of cultural capital for its demonstration must be internalized by the individual. Bourdieu called this concept *habitus* which is a "system of lasting, transposable dispositions which, integrating past experiences, functions at every moment as a matrix of perceptions, appreciations, and actions" (1977:82). The internalization of the social structure takes place in childhood, thus it is unconscious. Thus, *habitus* is one's disposition influencing the actions one takes as well as future aspirations. Based on the class a person is born into, he/she develops expectations. The internalized beliefs are "then externalized into actions that lead to the reproduction of the class structure" (Dumais, 2002:46). Children from higher social class obtain high level of cultural capital at home and this becomes part of their habitus, thus they will be able to display familiarity with high-status cultural codes that are rewarded by the school system (Bourdieu and Passeron, 1990). According to Bourdieu (1986) people's habitus is affected by their cultural capital, hence a person from a lower social class possesses less cultural capital and he/she is less likely to succeed.

Cultural capital contributes to children's scholastic achievement. Middle-class and wealthy parents can passively or with deliberate effort transmit their cultural capital to their children who can transform this into educational success. According to Bourdieu, embodied cultural capital is perhaps the most important as it becomes a part of children's habitus. The embodied form of cultural capital is increasing since it is passed down from one generation to another. Parents are paramount sources of acquisition of knowledge and attitudes that make children familiar with the school systems and their requirements. Parents with higher social status and educational levels contribute to their children's academic achievements. In addition, Bourdieu argued that objectified cultural capital such as various educational resources like books, magazines, pictures in the home is "symbolically and materially active, effective capital insofar as it is appropriated by agents and implemented and invested as a weapon and a stake in the struggles which go on in the fields of cultural production..." (1986:247). Objectified cultural capital can be acquired through material means such as expenditure on educational resources like elite schools, private tutors. They also can be operationalised through extracurricular activities, such as sports, ballet, music lessons, arts (DeGraaf, 1986; Kaufman and Gabler, 2004). Bourdieu (1986) argues that parental participation in highbrow cultural activities such as visiting galleries, museums, classical concerts are important elements of cultural capital in France.

In the institutionalized state, cultural capital is represented in the form of academic qualifications that cannot be passed down and will disappear when the holder dies. Institutional recognition "makes it possible to establish conversion rates between cultural capital and economic capital by guaranteeing the monetary value of a given academic capital" (Bourdieu, 1986:51). Students in elite universities benefit from institutionalized cultural capital by earning a valued academic credential that acts as an "officially recognized guaranteed competence" (Bourdieu, 2001:102). The value of such cultural capital depends on

its transferability to economic worth and that varies over time and on the labour market. Years spent in university do not only lead to a student's academic development, but they also provide an accumulation of social capital. Social capital refers to resources one gains through a "network of institutionalized relationships of mutual acquaintance and recognition" (Bourdieu, 1986:51). Having interpersonal connections with the right people who can help advancing one's career is indispensable. Bourdieu (2001) describes social capital as essential resources within social networks and may include the name of a family, a class, a party, a school or a tribe. Social capital can be accumulated from both families and schools and these are 'distinct constructs'

Although Bourdieu is often characterized as nation-bound focusing only on the French higher education system, there are many similarities found by researchers in other parts of the Western world. Nevertheless, others disagree with Bourdieu and argue that children from lower and working class family backgrounds can also benefit from cultural capital and can overcome their disadvantages. Although research regarding cultural reproduction theory has sparked a lot of debate (Kingston, 2001; Di Maggio, 1982; Lareau and Weininger, 2003; Jaeger, 2011), Bourdieu's work is seminal in understanding how social class advantage is maintained through the educational field.

The widespread use of English has numerous benefits in terms of economic development, access to higher education and technological developments (Crystal, 1997; Graddol, 1997). English has become "a global commodity that seems to have no sell-by date attached to it" (Pakir, 1999:104). Not only the majority of international organizations, such as the UN, IMF makes use of English, but it has also become the language of international tourism and modern technology (Graddol, 1997; Altbach, 2004). Although English has been the language of technology since the Industrial Revolution, the rapid technological development and the growth of the financial sector in the United States gave English a new 'linguistic power' (Crystal, 2003). Hence, access to knowledge is perhaps the main benefit of English language and English has become the medium of instructions in many higher educational institutions across the world.

3. Research design and methodology

In this study I followed a qualitative interpretive approach. Quantitative research would not fit my investigation because I wanted to gain a detailed understanding of the issues and that could only be done by talking directly to participants. I used a case study research because it is an effective way of gathering qualitative data about individuals' practices and experiences. By conducting in-depth interviews I was aiming to get rich data from a sample of 6 to 8 participants. As my research project is driven by a theoretical interest, I selected participants according to set criteria, if their experience was central to my research problem. I chose to interview 6-8 males and females who graduated from the School of Business and Management. They were Arab or part-Arab expatriates living in the UAE with four to seven year's work experience in the UAE since graduation. I also had to make sure that none of the participants were undertaking postgraduate or other professional degrees.

I used thematic content analysis where I analysed and coded the transcripts, identified categories and themes from the data. In order to ensure validity and reliability, I made sure that my interview technique was consistent across the sample, that I focused on the same areas and the interviewees' answers were treated with equal importance and used member checking to ensure credibility.

4. Discussion

The results showed some cross-cultural applicability of Bourdieu's cultural reproduction theory in the UAE context. There was evidence that my respondents achieved social mobility and there was a link between their parents' social status and the respondents' academic success. Their parents were able to choose good quality schools for their children and provide them with educational resources. They also had strong influence on their children's educational decision making process. My participants were privileged to pursue full-time higher education as their parents did not only pay their university fees but supported them through years of extended education. The findings show that the concept of what constitutes objectified cultural capital is different in the context of the study from Bourdieu's views in France.

Although Bourdieu (1986) finds participation in beaux art activities, attending classical music events and visiting museums and galleries important, in the UAE, music lessons, museum visits and other cultural activities were not important to the participants in my study. Instead, their main source of objectified cultural capital was their extensive travel around the world. In addition, there is a similarity between findings in the West and in this study in terms of educational resources in the home. All participants had an extensive collection of books, computer technology and satellite television in their homes and they were able to absorb this capital from an early age.

Social capital is accumulated both from the family and from school. Obligations, connections and norms that are associated through social ties positively affect children's educational outcomes (as discussed chapter 2.1.4). There is evidence that the participants in the study enjoyed social capital through family ties and through years of education in elite schools. Active participation in extracurricular activities, like being the president of the Student Council, was important in promoting academic achievement for some of them (Bernstein, 1975). However, not all of them were active in sports or other extracurricular activities. Although alumni networks are often considered very useful forums for social interaction and networking, there was no evidence that my participants benefitted from this form of social capital.

Although Bourdieu (1986) claims that the embodied cultural capital that is passed down from one generation to another is the most important one, my participants gained a significant amount of embodied cultural capital through English language and their American university degree. There was no evidence that their excellent English language knowledge, business and multicultural communication skills were not as natural as the cultural capital that they acquired at home. First, their English language skills represented an important form of cultural and linguistic capital. Although Arabic is the official language in the UAE, English has become the language of business and is the lingua franca (Randall and Samimi, 2010) (as discussed in chapter 4.1). Because English has become the sign of modernity and economic development, many parents in the UAE send their children to English medium schools. In higher education in the UAE, development and modernization have been linked to English language. Four of my respondents attended English medium schools and they all completed their higher education in an American university where the language of instruction was English. Therefore, in addition to embodied cultural capital that was acquired at home, participants also gained knowledge that they accumulated through years of education.

Perhaps the most important form of cultural capital was in the institutionalized form. American universities have been established in the UAE since the 1990's. A degree from AUS acts as an "officially recognized guaranteed competence" (Bourdieu, 2001:102). My participants strongly believed that their degree enabled them to find good jobs easily upon graduation. An American university is a "brand" that provides excellent benefits to a graduate. There was evidence that their employers seek graduates from American universities. In addition to the dual accreditation in the UAE and in the US, AUS is considered to have good standards. The value of institutionalized cultural capital depends on its transferability to economic worth (ibid). Therefore, based on the respondents' experience, an American degree offered them a clear form of institutionalized cultural capital when they found jobs easily and quickly progressed in their chosen careers.

My participants' views supported the idea that English language is celebrated as the most important language, and Arabic is losing its importance. Although they all knew Arabic, only those two that attended Arab medium schools claimed to be fluent and highly competent in the language. The others believed that English language negatively affected their other language skills and it made them lazy. Whether they were bilingual or trilingual, they only used Arabic or a third language with family and friends, and they used English only in their careers or in their studies. Their views supported the idea that English has had a negative effect on other languages (Phillipson, 1986).

5. Conclusions

I have analysed how cultural capital affected the professional careers of six Arab business graduates who completed their degree at an American university in the UAE. I was unable to find research on cultural capital or business communication in the UAE and my study has contributed to the knowledge of these fields. The study offered an insight into the experiences and stories of these young business people and the relationship between their cultural capital, educational backgrounds and their professional careers. The work has tested Bourdieu's cultural capital theory and various similarities were found, however, there are clear cross-cultural differences as well. The research shows that an American degree is an important form of symbolic capital in the UAE.

References

- Altbach, P. G., 2004. The Costs and Benefits of World-Class Universities. *Academe*, 90. (1) pp.20-23.
 Beckett-McInroy, E., 2006. *Bahraini Muslim women and higher education achievement*. Thesis (EdD). University of Bath, Bath.
 Bourdieu, P., 1977. *Outline of a theory of practice*. Cambridge: Cambridge University Press.

- Bourdieu, P., 1986. The forms of capital, in G.R. Richardson, eds. *Handbook of theory and research for sociology of education*. New York: Greenwood Press.
- Bourdieu, P., 1992. *The rules of art: genesis and structure of the literary field*. Cambridge: Policy Press.
- Bourdieu, P. and Passeron, J.C., 1990. *Reproduction in education, society and culture*. London: Sage.
- Crystal, D., 1997. *English as a global language*. Cambridge: Cambridge University Press.
- Crystal, D., 2003. *English as a global language*. 2nd ed. Cambridge: Cambridge University Press.
- DeGraaf, P.M., 1986. The impact of financial and cultural resources on educational attainment in the Netherlands. *European sociological review*, 4 (3) pp.209-221.
- DiMaggio, P., 1979. Review essay: on Pierre Bourdieu. *American journal of sociology*. 84 (6) pp.1460-1474.
- DiMaggio, P., 1982. Cultural capital and social success: the impact of status culture participation on the grades of high school students. *American sociological review*. 47 (1) pp.189-201.
- Dumais, S.A., 2002. Cultural capital, gender and school success: the role of habitus. *Sociology of Education*. 75 (1) pp. 44-68.
- Graddol, D., 1997. *The future of English*. The British Council
- Kaufman, J. and Gabler, J., 2004. Cultural capital and the extracurricular activities of girls and boys in the college attainment process. *Poetics*, 32 (2) pp.145-168.
- Pakir, A. 1999. Connecting with English in the context of internationalization. *TESOL quarterly*, 33 (1) pp.103-115.

NEW DEVELOPMENT AND INNOVATION OF FINANCIAL EDUCATION IN JAPAN

Suguru Yanata¹, Kaori Ishibashi² & Takao Nomakuchi¹

¹*Faculty of Economics, Wakayama University (Japan)*

²*Wakayama Shin-ai Junior and Senior High School (Japan)*

Abstract

Some developed countries conduct financial education in primary education. OECD aims to promote financial education. This is because financial products which an individual can access increase, it becomes more important to promote possession of individual financial assets and the importance of consumer protection is increasing. That is to say, the importance of financial education is increasing to improve financial literacy from young age. However, the international standards about educational contents and educational methods haven't been established yet, and differ from countries. By the way, financial education has been conducted in Japan, and it shows great result these days.

This study shows problems that financial education in Japan has had, and what is financial educational innovation that shows great result by international comparison. The result of this study can be a good example for countries which will conduct financial education in the future.

This study surveys financial education policy in Japanese government, then, previous studies, investigation reports and interviews about financial education cases which are done in Japanese educational institutions. Specifically, this study surveys financial education in U.S., U.K., Australia, and compares Japanese one with them. Also, this study surveys examples of financial education by public institutions and international institutions such as financial education project by OECD..

This study shows as below.

- Financial education in Japan has problems about teacher's financial acknowledgement, educational materials and lack of relationship between actual life and financial economy.
- The collaboration between government and educational institution to solve problems above may cause financial educational innovation.
- The development of financial education in Japan can be a good example for countries which need financial education in the future.

Keywords: *Financial Education, Educational Innovation, Educational Institution, Educational Policy, Industry-Academia-Government Collaboration.*

1. Introduction

The importance of financial education has been increasing in modern economic society. Financial education in this thesis refers to the report [OECD(2012)] issued by OECD/INFE(International Network on Financial Education) on Aug, 2012. The report defined it as *"the process by which financial consumers/investors improve their understanding of financial products, concepts and risks and, through information, instruction and/or objective advice develop the skills and confidence to become more aware of (financial) risks and opportunities to make informed choices, to know where to go for help, and take other effective actions to improve their financial well-being"*. [OECD(2012)p.7.] These days, we can see many developed countries have been doing financial education positively.

Japan, which has the second highest volume of household financial assets thinks financial education important similar to United States of America, which has the highest volume. In the 2000s, government mentioned about the importance of financial education and had been doing many kinds of actions in Japan. However, in an early stage of financial education in Japan, they can't evaluate educational effect positively, because the financial education method wasn't established. However, the method of financial education has caused in Japan, educational effect and reputation are increasing. The development and innovation in financial education in Japan can be a good model for other countries which are going to set about it.

Therefore, this theses introduces new perspective and innovation of financial education in Japan, and conducts international comparison.

2. Significance and purpose of financial education in Japan

There are many factors promoting financial education. For example, it is required to improve financial literacy and financial actions for the better after the latist financial crisis, it is required to form financial assets individually in global economic capitalization and financial liberalization, individual can access many kinds of financial products such as stock, investment trust, foreign exchange, money management fund, and many developed countries can't guarantee a pension in the future because cost of social security is increasing. Besides, the number of financial crime targeting individual is increasing, so it is required to develop individual financial literacy to protect consumers. Thus, financial education is one of the most important social policy not only for elderly people who tend to invest excess cash but also for young people.

In the 1990s, developed countries started to conduct financial education, but there is no global standard financial education method by for now, and every country tries to find better methods. Rather financial education might have to be different from economic characters in each country mentioned OECD(2012).[OECD(2012)p.7]

By the way, what is the aim of financial education in Japan? There was no guide to show the necessity of financial education, but a study group on Financial Education (Study Group of Financial Economy Education) formed by Japanese Financial Services Agency showed an official guide. According to this guide, the aim of financial education is summarized as below. (Figure 1)

Figure 1. Significance/purpose of financial education

●	Financial literacy as a life skill
➤	No one in modern society can avoid involvement with financial matters.
➤	It is important to make life planning a habit and acquire the knowledge and judgment needed to appropriately select/use financial products in order to achieve financial independence and lead a better life as a member of society.
●	Financial literacy to encourage the provision of sound, high-quality financial products
➤	Government regulations alone can only go so far in achieving user protection; moreover, excessive regulation could hinder innovation by financial institutions.
➤	As users improve their acumen in selecting financial products, better financial products can be expected to become prevalent.
●	Financial literacy encouraging the effective use of household financial assets in Japan
➤	The majority of Japan's approximately 1500 trillion yen in household financial assets is held in cash and savings. One reason for this is inadequate understanding of the benefits of diversified, long-term investment.
➤	If households are encouraged to engage in diversified, medium to long-term investment, the effect would be to help make available to growth sectors a sustained supply of funds.
(Source)Financial Services Agency(2013b)p.1.	

As you can read, the aim of financial education is to give individual profit as well as to develop economy of country and local area by "Financial Literacy". This way of thinking evokes the idea of "Social Common Capital" by Hirofumi Uzawa, who has taught in the University of Tokyo, the University of Stanford, the University of California at Berkeley and the University of Chicago. In Japan, it is sometimes treated with negative image to study about financial transaction and asset formation and to make a profit from investing financial products in Japan even now. However the system of finance is public good in civilized society and to invest unemployed capital in capital market temporarily can develop people seeking funds and society. Investors give society funds to make new value so that getting return as an equivalent for their investment should not be had a guilty.(Speculation should be apart from this matter.) although we think as such, the Financial Services Agency in Japan defined the aim and value of financial education as above and promoted financial education in many kinds of means and support. After that new development of financial education in Japan has begun and has formed an innovative financial education system.

3. New development and innovation of financial educational in Japan

We can say that financial education has been conducted since the 1960s, the period of rapid economic growth, as a view from just protecting consumers. It was after 2000, when the Financial Services Agency thought financial education of an important policy, and after 2005, when they declared

items to be done soon, that modern financial education was conducted. After that, a government, schools, local governments and financial institutions have developed and conducted many kinds of financial education independently. However Study Group on the Promotion of Financial and Economic Education (2014) found that 95 percent teachers who have conducted financial education in junior and senior high school had some difficulties in their financial education. Main difficulties are shown as below.

- The focus on understanding terminology or systems makes it difficult for students to relate lessons to their actual lives.
- Students learned the information, but found it difficult to pick up abilities or attitudes.
- Lack of expertise among teachers makes it difficult for students to understand the relationship between risk and return in investment.
- The main features of financial products were not necessary to teach until after high school.

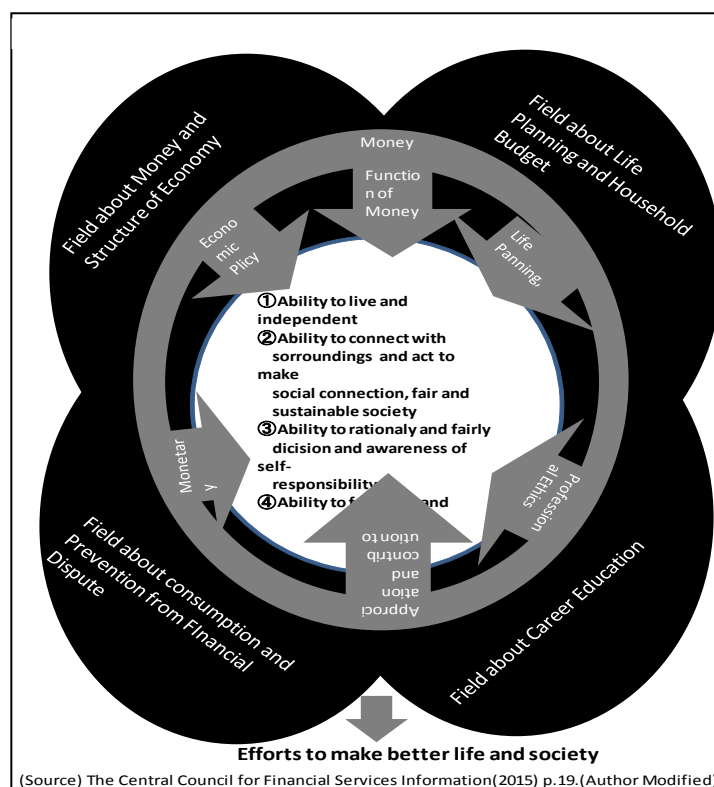
Such kind of indication causes the dramatic change of financial education in Japan. For example, Japanese government showed the aim of financial education (Figure 2) and the way to achieve it and industry-academia collaboration has been promoted. For example, Tokyo Gakugei University, University of Tsukuba and KAGOSHIMA University develop programs of financial education and conduct them collaborating with financial institutions in the suburbs (Some of them started it before 2013). This kind of industry-academia collaboration conducts required education and gets great results in each local area.

The efforts of industry groups also cause this kind of innovation and improve education effect significantly. For example, Japan Banker's Association which most of Japanese banks belong to distributes Web contents, CD-ROMs and pamphlets for free to tell people the roles of banks and promote people to use them appropriately. They make separate educational materials for elementary school, junior high school and senior high school and offer special educational programs for teachers for free. Japan Specialists from Banker's Association have classes at school, sometimes.

Furthermore, the most effective system which Japan Banker's Association offers is the school designation system of financial education. This system designates mainly high schools to concentrate on financial education and offers various education programs for students for free. This system has just started, but they had taught more than 20 schools by last year.

In addition, Bank of Japan and Japan Securities Dealers Association contribute financial education positively. Anyway, financial education in Japan is solving problems by industry-academia collaboration and industry groups and making effective educational methods. New development and innovation of financial education in Japan will be meaningful precedents for other Asian countries having similar sense of values as well as other countries exclude Asia to develop financial education system in the future.

Figure 2. Purpose of Japanese Financial Educational System



4. Other countries's case

Anglo-Saxon countries such as United States of America and England are the birthplace of financial education. So we would like to introduce examples of representative countries shortly. We mainly refer to Kurihara et al(2014) in this chapter.

First, United States of America has financial education programs in each State or school, though these are not public program. Especially the representative is an NPO corporation, Jump\$tart which more than 150 institutions interested in financial education invested and established. Jump\$tart conducts financial education investigations and financial literacy investigations of university students. [Kitano et al.(2014)p.299.] In detail, they prepare more than 800 educational materials and offer the system to learn knowledge about finance through SNS and Internet games. VISA also offers educational materials for free, which enables from children to adults to learn finance through games and textbooks. In United States of America, Financial Literacy and Education Commission was established in 2013 and started to develop public financial education. In England, financial education is part of official educational curriculums called Personal, Social, health, and Economic Education. According to the formal document by Department for Education which is in charge of educational policy, financial education is conducted for from 11 to 16 years old students connected with mathematic. [Department for Education (2013)p.103.] In Australia, after Melbourne Declaration on Educational Goals for Young Australians in 2008, national curriculum has been made. Financial education plans to be done about personal finance in Business and Economics curriculum for 5th grade students in elementary school though this is still draft curriculum in May 2015. [Miyahara(2014)p.18.] The other countries such as Germany and French become to conduct financial education positively.

Every countries which started financial education earlier than Japan have different systems. However, to think about United States of America is highly expected to introduce public financial education systems, we can say that government will play important roles and companies and industry groups will support it.(Government plays important roles in Germany and French.) Unfortunately, there are not so many results of study which show financial education system works effectively. To compare with Japanese case, industry-academia collaboration and collaboration with industry group improve financial education greatly in Japan. Therefore Japan is required to make financial education system as social policy to be a good model to such countries.

5. Conclusion

This theses shows the meaning of financial education and new development and innovation, also surveys about United States of America, United Kingdom and Australia and refers to the different points with Japan. This study shows as below.

- Financial education in Japan has problems about teacher's financial acknowledgement, educational materials and lack of relationship between actual life and financial economy.
- The collaboration between government and educational institution to solve problems above may cause financial educational innovation.
- The development of financial education in Japan can be a good example for countries which need financial education in the future.

This thesis shows that new development of Japanese financial education and innovation, but it will take a few years to get a full scale result. The importance of financial education is increasing in present society, so it is required to conduct better conducts in schools by trial and error. To improve financial education, it can be great support the view from not only economics but also education policy, teaching methodology.

References

- Department for Education(2013), *The national curriculum in England*, England : Department for Education.
- Financial Services Agency(2013a), *Report of Study Group on Financial Education*, Japan : Financial Services Agency.
- Financial Services Agency(2013b), *Study Group on Financial Education-Report Summary*, Japan : Financial Services Agency.

- Kitano,Y, Nishio, K, Ujikane, Y, Osanai,K(2014), Deference of the Financial Education in Japan from the Jump\$start in the U.S., *Annals of Society for the Economic Studies of Securities*, No.49, pp298-pp304.
- Kurihara,H, Yamane,E, Hotate,M, Miyahara,S, Inose, T, Hattori, S(2014), *Kaigai ni okeru kinyu keizai kyouiku no chousa ·kenkyu houkokusyo*, Japan:Japan Securities Dealers Association.
- Kusumoto,M(2014), Financial education and teaching materials the foreign currency deposits, *Manabiya Journal of teaching course*, No9, pp1.-pp12.
- Miyahara, S(2014), Australia ni okeru kinyu keizai kyouiku, H,Kurihara, *Kaigai ni okeru kinyu keizai kyouiku no chousa ·kenkyu houkokusyo*(pp.16.-pp.28.), Japan : Japan Securities Dealers Association.
- OECD(2012), *OECD/INFE High-Level Principles on National Strategies for Financial Education*, France:OECD.
- Study Group on the Promotion of Financial and Economic Education(2014), *Comprehensive Survey of Financial and Economic Education in Japan's JuniorHigh and High Schools*, Japan:Japan Securities Dealers Association.
- The Central Council for Financial Services Information(2015), *Financia Education Program(2015 Edited Version)* , Japan: The Central Council for Financial Services Information.
- Uzawa,h(2008), *Economic Analysis of Social Common Capital*, United Kingdom:Cambridge University Press.

EDUCATION AND TRANSITION TO WORK: PROMOTING PRACTICAL INTELLIGENCE

Giuditta Alessandrini

Department of Education Sciences, Rome TRE University (Italy)

Abstract

Pedagogy sets itself as an important component of the “culture of development”. In this connection, ascertaining whether certain aspects concerning changes in the way people work –either at a conceptual and practical level – and the manner today’s work culture can be supported and addressed by pedagogy is crucial in the present analysis. This is particularly the case when devising strategies to further professional and social development.

Work thus plays a major role in human development while gaining civil and educational values, which are dependent upon cultural and geographical factors in one’s social history.

This paper considers a number of questions in the current discussion on the transition to work, most notably the definition of the pedagogical approach by which the issues at hand are investigated, the review of the relationship between education and development in reference to employability, and the interpretation of the right to education in light of the precarious nature of the productive processes. This contribution also points to the relevance of the notion of “human development” as explored by Martha Nussbaum, professor of Politics and Philosophy at the University of Chicago, and Amartya Sen, who was awarded the Nobel Prize in Economics. It ends with a reflection on a welfare model supported by people empowerment that enhances individual capability. The argument put forward is that major shortcomings can be found in welfare systems in terms of employability. Against this background, the author welcomes a system which enables the full development of one’s capability.

The key aspect of development as freedom – which also recalls the title of Sen’s volume – lies in the idea of economic growth combined as democratic development arising out of everyone’s participation – thus not of the elite on an exclusive basis – to opportunities in terms of people’s capabilities, for they improve themselves through education and training.

The issue of development calls to mind the needs to promote the wealth of practical skills which are somehow related to the notion of “practical intelligence”. Simply put, drawing on the concept of *homo faber* becomes pivotal to devise policies in education which help to boost employability while increasing individual potential.

Keywords: *Competence, Human Development, Practical Intelligence, Capability, Liberty and New Welfare.*

1. Introductory Remarks

Pedagogy sets itself as an important component of the “culture of development”. In this connection, ascertaining whether certain aspects concerning changes in the way people work—either at a conceptual and practical level—and the manner today’s work culture can be supported and addressed by pedagogy is crucial in the present analysis. This is particularly the case when devising strategies to further professional and social development. Work thus plays a major role in human development while gaining civil and educational values, which are dependent upon cultural and geographical factors in one’s social history. Work lies at the heart of the “social question” which currently has been given momentum. This is particularly the case if one considers factors such as business relocation and the supremacy of finance over economics, which set the conditions for ongoing inequalities worldwide, to the extent that in some countries rights such as freedom and democracy are jeopardized. In this connection, reference has frequently been made in the West to the concept of the “erosion” of social capital, with the middle-class which now face hardship and social imbalance which might endanger civil coexistence. If one were to reconstruct, yet ideally, the historical and semantic characteristics through which the concept of “work”

has been referred to as a source of humanization over the years, mention should be made of figures such as Augustine of Hippo, Benedict of Nursia, Comenio, as well as Rousseau, Locke, Froebel and Hensen.

In the last thirty years, a number of significant changes in the regulation of the employment relationship – e.g. de-standardisation – led to the establishment of certain “drivers”: the gradual decline of the Fordist system of production, the emergence of the networking system, and the consolidation of information and the knowledge economy. Accordingly, changes in the notion of “subordination” and a review of work hierarchies – particularly in large-sized enterprises and the public sector – have been key components in today’s world of work. Another main element which is worth mentioning is the rise of numerous contractual arrangements, the growing relevance of self-employment, as well as the increase in precarious work, which can be found particularly in those sectors marked by low levels of protection.

The pedagogy of work – also in consideration of the range of interpretations conveyed by new meanings over time – questions the merely functionalistic approach of the existing relation between work and individuals. The pedagogical notion of “work” can be looked through a dualistic approach, which serves to promote an educational dimension and to prepare the individual to social commitment (Here “social commitment” refers to both the idealistic perspective related to the ethical State and the more active engagement to democratic participation to public life).

Evidently, the latter echoes Dewey, as he argued that “the educational process is one with the moral process”, adding that “according to this novel approach gaining skills and possessing knowledge and education is not to be intended as the final goal, but as an indication of growth and a reason to carry on”. Dewey also maintained that “Democracy has different meanings, yet its moral meaning lies in deciding that the supreme evaluation of political institutions and productive assets draws on the contribution provided by every member of society to steady growth”.

2. The Notion of “Competence”

According to the relevant literature, what is meant by “competence” is “a combination of proficiencies” where a range of skills comes into play, e.g. technical, theoretical, methodological skills, procedural and operational abilities and relationship skills allowing people to operate in ever-changing contexts. When it comes to education and training, investing in someone’s competencies might be seen as an attempt to help adults further develop their skills. In this sense, gaining competencies becomes even more important for it exemplifies the way individuals behave and express their potential in a given organization. The essence of “competence” lays in the individual ability to combine different proficiencies – hence the evolutionary dimension – taking as its starting point already existing cognitive, emotional and valuable experiences, not only to produce controlled performances, but to promote the willingness to develop planning capacity so as to take concrete action. As such, the idea of “competence” thus refers to a process marked by dynamic and evolutionary aspects.

One must certainly agree with the argument that work must be investigated considering the concept of “competence”, particularly at the time of planning training activities. Yet it must be acknowledged that the skills evaluation for certification purposes necessarily needs to take a wider approach than that examining the production process. Such analysis necessitates an inclusion of ‘transversal’ competence, and emphasis on the role of those emotional and cognitive components which act as a catalyst for individuals to contribute to their own learning.

According to OECD, taking into account learning outcomes in formal education only, thus disregarding the effects of informal learning, would compromise the evaluation of human capital.

3. Human Development

Human development can be examined from perspectives other than those including quantitative analysis – based on a merely functional approach which considers economic growth – which might also investigate the issue referring to aspects such as social life as a whole. According to Martha Nussbaum, profit is the means intended to support human existence, yet “the aim of global development, as well as that of effective national politics, is to allow people to live a purposeful and creative life, developing their potential and organizing a meaningful life in line with their dignity”.

In this sense, there is common consensus that it is necessary to investigate the pathways to human development in a more detailed way, thus beyond merely calculating the GDP. Here, it might be worth recalling the Human Development Index (HDI), according to which national development should be measured not only on the basis of national income – although this was common practice in the past – but also taking account of such aspects as life expectancy, literacy rates, multidimensional inequality, gender imbalance and extreme poverty.

The Human Development Index appeared for the first time in 1990 in a report published by the United Nations Development Programme. As already pointed out, the premise behind the establishment of this index was that – apart from national income – the development of a country should be measured also controlling for such elements as life expectancy and literacy rates, for which data were already available in other countries for comparative purposes. The human development perspective affected a whole generation of policy-makers and social development experts, also those within the United Nations.

Economic growth in its own right does not improve the quality of life, especially if one considers sectors such as health care and education. In a recent publication, Martha Nussbaum has shown that an increase in GDP does not impact on political liberty. China and India are suitable examples of this trend. In a similar vein, the US gained 1st place in GDP rankings, yet placing 12th on the Human Development Index. Overall, average HDI rose by 18% since 1990 and 41% by 1970.

This year, the HDI Report provides three new criteria to measure the development rate: multidimensional poverty, gender inequality and extreme poverty. HDI is measured for the majority of world countries, providing valuable insights to both economists and experts of social science.

4. Development and Practical Intelligence

The issue of development calls to mind the needs to promote the wealth of practical skills which are somehow related to the notion of “practical intelligence”. Simply put, drawing on the concept of *homo faber* becomes pivotal to devise policies in education which help to boost employability while increasing individual potential. Here it might be fitting to make mention of The Craftsman, the first of three volumes by Richard Sennett, who praises craftsmanship as a necessary skill to face everyday life, the result of the interconnection of technical proficiencies and human thought. According to Sennett, workshops are places of culture where social rituals—or solidarity of a ritualized kind—have been established with time. The idea of autonomous work underpinning the concept of “citizen/craftsman” have existed since Ancient Greece, and further developed in China, Italian Renaissance and the *Encyclopedie* movement.

According to Sennett, technical expertise means “narration”, ongoing reflection which can also turn into “obsession” with quality. It is embedded in the community and translates into criteria, rituals, and rules. It means re-elaborating through language and, finally, challenging entrenched dogma.

It is the education system which should prioritize issues such as practical, cooperative and collaborative learning, providing the fundamentals to run projects and developing entrepreneurial skills also related to practical intelligence. In Sen and Nussbaum’s terminology, capability is the real potential upon which “human flourishing” is built.

People’s wellbeing goes far beyond their wealth, for it involves the opportunity to develop their life plan in accordance with their capability. Hence the reference to a new economy, concerning human development, which should promote either personal growth or wellbeing and support the setting-up of active policies intended to further such development. One might dare to talk of “hermeneutics of practice”. Practice does not rest upon theories worked out beforehand, but it is dependent on the ability to interpret ever-changing reality, a task which is possible only through everyday experience.

Far from being granted at once, such capability is the result of ongoing interpretation and “contextualisation”; this is the main essence of thinking, which thus starts from experiencing.

In Italy, the relationship between practical knowledge, learning and employability is a thorny issue which has been the subject of a number of proposals put forward by relevant authorities at a regional and company level. However, major shortcomings exist, particularly in terms of skills certification gained through on-the-job learning. The apprenticeship system—which has been devised by the Legislator to favour the matching of labour demand and supply, is still regarded merely as a contractual arrangement to reduce the labour costs and make this working scheme a temporary one.

5. Capability and Empowerment

By developing “educational capital”, people empowerment is the first step towards “substantial freedom” that is – to use Sen’s words – “a kind of freedom which involves the capability to convert available goods and resources into freedom to pursue one’s objectives and goals, conduct alternative lifestyles and develop one’s life plan according to individual values”. Capabilities are thus essential rights that, yet differently, need to be safeguarded and granted to all citizens. The theoretical framework underlying the capability approach was already formulated by Sen in the mid-1980s. Recently, the original frame of reference was expanded by a number of authors to consider such aspects as public policy and to investigate issues such as law and ethics from different perspectives (among others, Robeyns in 2005).

Protecting human dignity calls for high levels of capabilities on the part of citizens. According to Nussbaum, ten capabilities are necessary to accomplish social justice, which can be classed in internal capabilities (personal traits, intellectual and emotional capabilities, capabilities in terms of perception and movement) and combined capabilities (resulting from interaction with environmental factors) and might result in certain “functionings”.

“Agency” is another important concept in Nussbaum’s capability approach, for it clarifies the process intended to change values and objectives.

A just society should be accomplished throughout the realization of equality concerning the capabilities of its members. Consequently, it is not utility that should be pursued – e.g. to redistribute primary goods – but to develop capabilities to utilize such goods, in order to convert them into standards of living. As discussed earlier, Nussbaum talks of ten capabilities, most notably:

1. *Life*. Being able to live to the end of a human life of normal length; not dying prematurely, or before one’s life is so reduced as to be not worth living.

2. *Bodily Health*. Being able to have good health, including reproductive health; to be adequately nourished; to have adequate shelter.

3. *Bodily Integrity*. Being able to move freely from place to place; having one’s bodily boundaries treated as sovereign, i.e. being able to be secure against assault, including sexual assault, child sexual abuse, and domestic violence; having opportunities for sexual satisfaction and for choice in matters of reproduction.

4. *Senses, Imagination, Thought*. Being able to use the senses, to imagine, think, and reason, and to do these things in a “truly human” way, a way informed and cultivated by an adequate education, including, but by no means limited to, literacy and basic mathematical and scientific training. Being able to use imagination and thought in connection with experiencing and producing self-expressive works and events of one’s own choice, religious, literary, musical, and so forth. Being able to use one’s mind in ways protected by guarantees of freedom of expression with respect to both political and artistic speech, and freedom of religious exercise. Being able to search for the ultimate meaning of life in one’s own way. Being able to have pleasurable experiences, and to avoid non-necessary pain.

5. *Emotions*. Being able to have attachments to things and persons outside ourselves. Supporting this capability means supporting forms of human association.

6. *Practical Reason*. Being able to form a conception of the good and to engage in critical reflection about the planning of one’s own life. This entails protection for the liberty of conscience.

7. *Affiliation*. Being able to live for and toward others, to recognize and show concern for other human beings, to engage in various forms of social interaction; to be able to imagine the situation of another and to have compassion for that situation; to have the capability for both justice and friendship. (Protecting this capability means protecting institutions that constitute and nourish such forms of affiliation, and also protecting the freedoms of assembly and political speech.). Having the social bases of self-respect and non-humiliation; being able to be treated as a dignified being whose worth is equal to that of others. This entails, at a minimum, protections against discrimination on the basis of race, sex, religion, caste, ethnicity, or national origin.

8. *Other Species*. Being able to live with concern for and in relation to animals, plants, and the world of nature.

9. *Play*. Being able to laugh, to play, to enjoy recreational activities.

10. *Control over one’s Environment*. Being able to participate effectively in political choices that govern one’s life; having the right of political participation, protections of free speech and association. Being able to hold property in terms of real opportunity; having the right to seek employment on an equal basis with others; having the freedom from unwarranted search and seizure. Being able to enjoy the right of property.

6. Summary: Capability, Liberty and New Welfare

According to Sen, three elements need to be considered in order to appreciate the role of capabilities: the direct relationship with human wellbeing and freedom, the indirect impact of capabilities on social changes, and the indirect effect that capabilities have on economic production. In Sen’s terminology “the welfare of capabilities” allows individuals to demand the exercise of their own rights, first of all learning.

This right is a lifetime one and relates in important respects to the right to citizenship. The validity and forward-thinking which characterize “lifelong learning” – a concept which has been circulating since the 1990s – should be given more significance and form the basis of new welfare. There is a need of developing political awareness of the issue. This includes widening the right to education through life, devising a system of skills certification and validation to ensure full active participation to

social life. To do so, people should be helped to familiarize themselves with such an evolutionary approach, focusing on capability through “lifelong guidance”.

The key aspect of development as freedom – which also recalls the title of Sen’s volume – lies in the idea of economic growth combined as democratic development arising out of everyone’s participation – thus not of the elite on an exclusive basis – to opportunities in terms of people’s capabilities, for they improve themselves through education and training.

The issues discussed above pose a number of questions for academic research, two of which are particularly relevant: to what extent can the capability approach translate into an education theory on which it can be experimented in practice?; which educational strategies – either at a local, national, international level – can be devised to safeguard the capability right of those facing problems in terms of the school-to-work transition?

By way of conclusion, one might quote Sen, who has argued that “Development is a great adventure to live through freedom”. This passage is significant, for the development Sen is making reference to is far from being accomplished.

References

- Alessandrini, G. (2013). *La formazione al centro dello sviluppo umano. Crescita, lavoro, innovazione*. Milano: Giuffrè.
- Alessandrini, G. (2014a). *La “pedagogia” di Martha Nussbaum. Approccio alle capacità e sfide educative*. Milano: Franco Angeli.
- Alessandrini, G. (2014b). *Apprendistato, Competenze e prospettive di Occupabilità*. Lecce-Brescia: Pensa Multimedia.
- Alessandrini, G., Pignalberi, C. (2012). *Le sfide dell’educazione oggi. Nuovi habitat tecnologici, reti e comunità*. Lecce: Pensa Multimedia.
- Boam, R., Sparrow, P. (1996). *Come disegnare e realizzare le competenze organizzative*. Milano: Franco Angeli.
- Cipollone, P., Sestito, P. (2010). *Il capitale umano*. Bologna: Il Mulino.
- Dewey, J. (1916). *Democrazia e educazione*. Firenze: La Nuova Italia.
- European Commission (2011a). *EUROPA 2020. Una strategia per una crescita intelligente, sostenibile e inclusiva*. Brussels: European Commission.
- European Commission (2011b). *Conclusions on a strategic framework for European cooperation in education and training (ET 2020)*. Brussels: European Commission.
- Lave, J., and Wenger, E. (1991). *Situated Learning. Legitimate Peripheral Participation*. Cambridge (MA): Cambridge University Press.
- Mezirow, J. (2000). *Learning as Transformation: Critical Perspectives on a Theory in Progress*. San Francisco: Jossey Bass.
- Mortari, L. (2003). *Apprendere dall’esperienza. Il pensare riflessivo nella formazione*. Roma: Carocci.
- Nussbaum, M.C. (2001). *Diventare persone. Donne e universalità dei diritti*. Bologna: Il Mulino.
- Nussbaum, M.C. (2002). *Giustizia sociale e dignità umana. Da individui a persone*. Bologna: Il Mulino.
- Nussbaum, M.C. (2010). *Non per profitto. Perché le democrazie hanno bisogno della cultura umanistica*. Bologna: Il Mulino.
- Nussbaum, M.C. (2012). *Creare capacità. Liberarsi dalla dittatura del Pil*. Bologna: Il Mulino.
- OECD (2014). *Education at a Glance. OECD Indicators*. Paris: OECD.
- UNDP (2013). *Rapporto sullo Sviluppo Umano 2013. L’ascesa del Sud: il progresso umano in un mondo in evoluzione*. 20th Anniversary Edition: UNDP.
- Sen, A. (2000). *Lo sviluppo è libertà. Perché non c’è crescita senza democrazia*. Milano: Mondadori.
- Sennett, R. (2006). *La cultura del nuovo capitalismo*. Bologna: Il Mulino.
- Sennett, R. (2008). *L’uomo artigiano*. Milano: Feltrinelli.
- Wenger, E. (2006). *Comunità di pratica. Apprendimento, significato e identità*. Milano: Raffaello Cortina.

A COMPARATIVE LOOK AT SOCIAL JUSTICE IN SOUTH AFRICAN EDUCATION AND NORWEGIAN INTRODUCTION PROGRAMME FOR REFUGEES

Anne Grethe Sønsthagen

Sogn og Fjordane University College (Norway)

Abstract

The theory of justice as fairness together with aspects such as economic, social, and cultural capital and the issue of Western hegemonic discourse in education underlie this paper. The objective of the study is to look at connections between the findings collected from five high schools with diverse socioeconomic, cultural, and racial backgrounds in South Africa and the experiences from the work with refugees with a Norway residence permit, who attended the obligatory two-year long “introduction programme”. By looking at these different contexts, the author opts to find similarities between a well-resourced country, where the culture and knowledge systems of the majority are hegemonic, and a country with an emerging economy, where the minorities’ culture and knowledge systems are hegemonic. The research employed a mixed-method research strategy, integrating both qualitative and quantitative methods. The methods of this paper were based on the initial research, adding observations and conversations from work with refugees, together with the Directorate of Integration and Diversity report from 2014. The study showed that there are several differences between the South African and Norwegian contexts. However, when focusing on social justice, similarities can be found, and this is the focus of this paper. The research about the South African education system indicated that the current approach to social justice and redress was limited by a narrow interpretation of the country’s social inequalities, failing to consider that Western knowledge was hegemonic in the education system. This paper argues that the current situation of training and preparation of refugees in Norway share some of the same limitations, and calls for a wider and democratic approach to social justice.

Keywords: *South Africa, Norway, social justice, adult education, hegemonic discourse.*

1. Introduction

The Norwegian government has begun the work on developing a new holistic policy, focusing on adults who have been left behind in the work market. One of the target groups are immigrants with deficient language skills or educational level, or with unacknowledged competence (Kunnskapsdepartementet, 2014). This shows that even though Norway is a well-resourced society, some of the country’s inhabitants are struggling to benefit from the society. In 2012, I had conducted a research in South Africa to examine the extent to which five South African high schools with various socioeconomic and cultural backgrounds addressed the issues of social justice, in relation to learners’ traditional, cultural, racial and social backgrounds. The approach to social justice was limited by a narrow interpretation of the country’s social inequalities and failure to consider the importance of western hegemony and cultural and social capital in the education system (Sønsthagen, 2013).

The differences between the South African high school education system and the Norwegian introduction programme for refugees, particularly in relation to the available resources, will play an important role for the findings from South Africa and Norway. However, regardless of these differences, the objective of the study is to perceive the connection between the two contexts while focusing at social justice. First, the concept of social justice as understood in this paper is explained. Thereafter, the study highlights certain important issues related to the two contexts and the importance of hegemonic knowledge. The paper examines the social positions, Pierre Bourdieu’s three capitals and the methodology of the study, before discussing the connections between the South African education system and the Norwegian introduction programme.

There are several definitions of social justice, and it is not a straightforward process to define it. Nevertheless, the underlying goal of social justice is to: “propose adequate mechanisms used to regulate

social arrangements in the fairest way for the benefit of all” (Mncube, 2008, p. 79). Social justice does not entail equal treatment of all individuals in society; the resources should be distributed in an equitable way. Furthermore, Rawls’s (1971) theory of justice is of absolute importance in understanding this study. He proposed social justice as a fairness-theory that includes two principles, the first is related to basic liberties and rights and the second is related to the arrangement of social and economic inequalities. These arrangements need not be distributed equally; however, they should be to everyone’s benefit. Rawls (1971) named this as the difference principle. When the difference principle was combined with fair equality of opportunity, the “democratic equality” interpretation of the second principle eventuated, which is the interpretation used in the present study.

1.1. Contextual and theoretical background

It is claimed that South Africa is one of the most unequal countries in the world, with around half of the population living in poverty (Breidlid, 2013). Even though the government in the post-apartheid period has promoted a democratic society redressing past injustices, studies have stated that the government has steered the country by a neoliberal path and that the post-apartheid period has evidenced a dramatically worsening of inequality within the groups (Marais, 2011). Sefa Dei (2006) claimed that the market received primary attention in the democratic period, contributing to the damaging effects on the education system, reproducing the inequalities of the general society (Marais, 2011). Grimaldi (2012) argued that through a neoliberal approach in education, “social justice is defined in the light of a minimal understanding of the concept of equality”, ignoring structural factors and a democratic educational approach and dismissing the role of education as a social good. Thus, a minority of South African learners received quality education, which was distributed through discriminatory class and racial lines (Marais, 2011). In addition, the World Economic Forum Report (2014) ranked the quality of South Africa’s general education system as 146 out of 148 countries.

Norway is both a constitutional monarchy and a parliamentary democracy (Thuesen, 2015). The Norwegian society values equality, non-sexism and non-racism, freedom of speech, and so forth. In 2014, around 8800 people got the refugee status and were accepted for a resident permit in Norway. The biggest refugee groups were from Eritrea, Syria, and Somalia (Utlendingsdirektoratet, 2014). The Directorate of Integration and Diversity (IMDI) have the responsibility of settling refugees with a residence permit in the different municipalities in Norway. All refugees with a residence permit have a right and duty to attend the two-year introduction programme, and all municipalities that settle refugees are obliged to offer this programme. The aim is to provide basic Norwegian language skills and an insight into the Norwegian society, with the goal to prepare the refugees for the workforce or education system. The programme consists of lessons in Norwegian language, social studies, and skills needed for entering the labour market, continuing education and career guidance. While attending the programme, the refugees receive economic support allocated by the municipality (Introduksjonsloven, 2005).

When comparing these two contexts and focusing on social justice, hegemonic knowledge and culture gained relevance. Several authors have written about the Western hegemonic discourse (among others Breidlid, 2013; Sefa Dei, 2006). At present, the exclusion and othering of traditional knowledge systems of indigenous African people in particular seemed to be relevant both in the South African context with a majority of African people and in the Norwegian context where the majority of refugees came from African countries, particularly from Eritrea and Somalia. Even though the majority in South Africa came from an African background, the knowledge production and epistemology that the schools seemed to value the most have been westernised (Breidlid, 2013). Considering that Norway is a Western country, it is natural for the hegemonic discourse to be westernised. According to Ntuli (2002), the Western thought is built on a philosophy of division and control, where hierarchies of values govern the world. Additionally, the West is seen as a power system that emphasises modern science, modern medicine and key concepts, such as individuality, rationality, and progress, over the traditional knowledge systems (Breidlid, 2013). Several educational researchers from both Western and Southern countries have challenged the fact that indigenous knowledge has been marginalised, and that Western knowledge has been universal and taken-for-granted (see among others Breidlid, 2013; Sefa Dei, 2006).

People are born into different social positions that allocate them to different groups with diverse economic, cultural and social capital. Rawls (1971) stated that individuals are born into different social positions with different expectations in life. The political system in addition to social and economic circumstances determines these life expectations. In societies with deep inequalities such as South Africa, such unequal opportunities and expectations are especially apparent because the social position one is born into affects one’s initial chances and prospects in life (Marais, 2011; Rawls, 1971). This can be related to Bourdieu’s (1997) theory of capitals. A person’s social goods are dependent on his/her capital, which includes the values, access and resources of the person. Bourdieu (1997) presented capitals in three fundamental ways: through economic, cultural, and social capital. The economic capital is directly

convertible into money while the cultural capital can be convertible into economic capital under certain conditions. Further, cultural capital can be gained through education and used to increase the individual's economic capital. Social capital can be "made up of social obligations (connections), which are convertible, in certain conditions, into economic capital and may be institutionalised in the form of a title of nobility" (p. 47). Bourdieu (1997) further argued that the education system constituted of the cultural capital of the dominant group in the society, thus reproducing advantages and disadvantages.

2. Methodology and ethical considerations

The research about South Africa, including learners, teachers and principals, from five high schools of various socio-economic and cultural backgrounds required specific methods to answer the research questions. A mixed-method strategy, integrating qualitative and quantitative methods, was used. There were overlapping areas between the two methods, and several researchers combined them through mixed-methods in various ways (Ellis et al., 2006). By the use of qualitative interviews, focus group and observations, a clear picture on the particular participants' views and attitudes was obtained, and through the questionnaires, the more general perceptions at different schools were examined. The focus on 'knowing more' was one of the goals of integration (Ellis et al., 2006). Regarding the Norwegian context, the discussion and examples were based on the 2014-report from IMDI and the experiences gained when working with refugees who attended the introduction programme. Around 60–70 refugees attended the introduction programme in the municipality, and a majority of them were from Somalia and Eritrea.

Quantitative researchers are often concerned with the validity and generalisation of their results, whether the methods investigated what it was supposed to investigate and whether the result could be transferred to other situations or subjects (Bryman, 2012). The present study did not aim at such validation or generalisation. Rather, it aimed to find connections between the views and perceptions of the South African sampling unit and the Norwegian introduction programme.

Research cannot be value-free, and this needs to be recognised and acknowledged (Bryman, 2012). This relates to the issue of reflexivity, which Guba and Lincoln (2005) defined as "the process of reflecting critically on the self as researcher, the 'human as instrument'" (p. 210). All data used in the formulation of this study were kept anonymous, and the examples from the Norwegian context were based on a general overview and not on specific persons.

3. Results and Discussion

This section focuses on some of the connections found between the South African high schools and the Norwegian introduction programme for refugees, in relation to social justice.

In the previous research on South Africa, the South African government failed to address the past divisions from apartheid, through a narrow approach to social justice and redress (Sønsthagen, 2013). This created a conviction amongst the participants that education reproduces inequalities rather than challenging them, coinciding with Bourdieu's (1997) viewpoint. The overall perception was that the people's socioeconomic background, and to a certain degree, racial background, together with economic and cultural capital, determined their prospects in life. Thus, South African institutions conveyed the impression that some social positions were favoured over others. Rawls (1971) claimed that it is a natural fact that people are born into different social positions; nevertheless, when major institutions of the society favoured certain starting places over others, it became unjust. In Norway, there is an increasing focus on academic education, and Lai (2013) warned against what she calls "the master sickness", referring to the fact that more people are studying at master-level than ever before. In 2014, the county Sogn og Fjordane, showed the lowest percentage (18%) of refugees who succeeded in attaining a job or joining the general education system directly after the introduction programme. The average percentage of such successful refugees in Norway was 44% (Integrerings- og mangfaldsdirektoratet, 2014). During an informal review of the background of the refugees in the municipality considered for the study, it became evident that over 50% of the refugees had not completed primary education from their home country, and the majority of them attended Norwegian class at a lower level than was expected by the general education system and workforce. This may be one of the reasons why many of them ended up in the social welfare system. This shows that Bourdieu's (1997) concept of reproduction of inequalities was also relevant in this context.

Furthermore, some of the refugees had bachelor degrees and a few had master degrees from their home country. However, very few of them had papers from their education institutes, and some of them had faced problems getting the degree approved by NOKUT (the Norwegian Agency for Quality Assurance in Education). The Norwegian labour force showed high demands regarding formal competence, and most jobs demanded at least high school education and a certain level of Norwegian

skills (Integrerings- og mangfaldsdirektoratet, 2014). Most of the employed refugees with degrees ended up in jobs where higher education was not required. This coincided with IMDI's report, stating that working immigrants were overrepresented in jobs that did not require education (17% against 3% in the entire population). It can be claimed that Norway does not value the cultural, social and educational capital of the refugees in the country (Bourdieu, 1997).

Both in South Africa and Norway, and in the world at large, it is argued that Western knowledge system and culture have hegemony while other non-hegemonic knowledge traditions play a more peripheral role (Breidlid, 2013; Glaser, 2013). The main understanding of the South African participants indicated that the Western knowledge and culture, together with Christianity, played a hegemonic role in the participating schools. Since Norway is a Western country, this knowledge and culture can be considered as natural. However, it can be argued that social justice in a wide approach is not achieved through the hegemony of Western knowledge. Through the focus of the introduction programme, one can question how socially fair the system is. At the same time, it is important to note that the goal of the introduction programme is to train and prepare the refugees for a quality life in Norway (Introduksjonsloven, 2005). However, this raises a question, whether this should be done at the cost of the participants' culture, self-worth, and self-belief, and if the cultural recognition and value is not as important for the minority population. Self-worth is an important part of Rawls (1971) justice as fairness-theory; thus, damaging the self-worth of learners and participants is an injustice, and furthermore, it reproduces inequalities in the society (Bourdieu, 1997).

The majority of the South African participants saw core skills, such as science, technology and English, as the most important for them to learn. None of the respondents answered that cultural knowledge and skills was the most important. This coincided with a narrow, neoliberal approach to social justice in education (Grimaldi, 2012). The core skills needed in the labour market is important for the learners so that they can enter the labour force, especially considering that the World Economic Report (2014) ranked the country as the last country regarding the quality of math and science education. Through the introduction programme, the Norwegian values and skills were stressed. Among others, the introduction programme focused on the importance of being punctual, withdrawing payment if the participants were late or did not show without any documentation of their absence. It should be noted that not wanting to attend work placement in, for instance, a grocery store because of the contradictions with Islam (selling pork and alcohol) was not accepted as a valid reason. The refugees could decide not to attend; however, they would lose money for the time they could have been at work placement. Furthermore, the importance of Norwegian culture and language were also stressed for the refugees to get a job. The reasons for this focus were that these skills were considered as important in the society and the introduction programme would ensure that the refugees would be self-sufficient in the Norwegian society. If the refugees wanted to follow the introduction programme, they had to follow the rules set by the government. Occasionally, they were given the choice to leave the introduction programme; nonetheless, they would have a few rights in the society. NAV (the Norwegian Labour and Welfare Administration) would give them a minimum amount of money since they had denied the benefits of the introduction programme. In addition, if they did not have the required amount of Norwegian lessons (550 hours) and social studies (50 hours) (Introduksjonsloven, 2005), they could face problems renewing their permit. Thus, the refugees must see the importance of learning these core skills to enter the labour market.

Nevertheless, social justice requires more than a narrow, neoliberal approach focusing solely on economic terms. Cultural recognition and a feeling of self-worth are important parts of social justice, and can be a way to diminish reproduction of inequalities (Bourdieu, 1997; Grimaldi, 2012; Rawls, 1971). According to Grimaldi (2012), a democratic approach to social justice and education is where structural factors are taken into account rather than a limited focus on economics and the labour market. This coincides with Rawls, who stated: "the value of education should not be assessed solely in the terms of economic efficiency and social welfare. Equally, if not more important is the role of education in enabling a person to enjoy the culture of his society and take part in its affairs, and in this way to provide for each individual a secure sense of his own" (1971, p. 101). This indicates the importance of acknowledging the diverse knowledge traditions and cultures, rather than solely focusing on the hegemonic and Western knowledge and culture. It can be argued that cultural skills and knowledge are important in both contexts for several reasons, including identity building, a feeling of self-worth, and in order to create a more socially just society based on understanding, respect and tolerance. This coincides with Rawls' (1971) justice as fairness-theory, allowing all citizens to take part in their culture. A wider and democratic approach to social justice is needed, where education becomes a tool for social change, equipping people with the cultural capital required for participation and inclusion in the society and the skills relevant to the labour market.

4. Conclusion

Even though Norway is a well-resourced country and South Africa is a poor country with an emerging economy, a connection can be built up between the South African high schools and the Norwegian introduction programme with regard to social justice. This shows the importance of non-material factors when one looks at the importance of social justice in education. Even though both the countries focus on the importance of being democratic countries, the content of both systems have been argued as reproducing inequalities and being based on a narrow, neoliberal focus on social justice that is based on economic terms. In order to achieve a wider approach to social justice, the differences in social and cultural capital need to be taken into account, as well as cultural recognition. In this democratic approach to education, ensuring that South African learners and participants in the Norwegian introduction programme do not feel alienated in school or their programme, together with taking into account other social factors like race and religion, social justice may be achieved (Grimaldi, 2012). As Grimaldi claims, when focusing on limiting, neoliberal terms in education “any reference to progressive values such as education for citizenship, democratic schooling, active and critical thinking, students wellbeing and cultural recognition” vanish (2012, p. 1150). In this study, the views of the refugees in the Norwegian introduction programme have not been considered. Therefore, further research needs to be done on such issues with the focus on the refugees’ voices.

References

- Bourdieu, P. (1997). The Forms of Capital. In A. H. Halsey, H. Lauder, P. Brown & A. S. Wells (Eds.), *Education: Culture, Economy and Society* (pp. 46-59). Oxford: Oxford University Press.
- Breidlid, A. (2013). *Education, Indigenous Knowledges, and Development in the Global South: Contesting Knowledges for a Sustainable Future*: Routledge.
- Bryman, A. (2012). *Social Research Methods* (4 ed.): OUP Oxford.
- Glaser, V. (2013). Ansvarliggjøring og myndiggjøring av barnet – i et dannelsesperspektiv. In S. Øksnes (Ed.), *Danning i barnehagen* (pp. 16).
- Grimaldi, E. (2012). Neoliberalism and the marginalisation of social justice: the making of an education policy to combat social exclusion. *International Journal of Inclusive Education*, 16(11), 1131-1154. doi: 10.1080/13603116.2010.548105
- Guba, E., & Lincoln, Y. (2005). Paradigmatic controversies, contradictions, and emerging confluences. In N. Denzin & Y. Lincoln (Eds.), *The Sage Handbook of qualitative research* (3 ed.): Sage Publications.
- Integrerings- og mangfaldsdirektoratet (2014). Årsrapport 2014.
- Introduksjonsloven (2005). Lov om introduksjonsordning og norskopplæring for nyankomne innvandrere. Retrieved 05.05.2015, from <https://lovdata.no/dokument/NL/lov/2003-07-04-80>.
- Kunnskapsdepartementet. (2014, 14.04.2014). Livslang læring og utenforskap. Retrieved 05.05.2015, from <https://www.regjeringen.no/nb/aktuelt/Livslang-laring-og-utenforskap/id757397/>
- Lai, L. (2013). Mastersyken. *Kapital*, 4.
- Marais, H. (2011). *South Africa Pushed to the Limit: The Political Economy of Change*: Zed Books.
- Mncube, V. (2008). Democratisation of education in South Africa : issues of social justice and the voice of learners? *South African Journal of Education*, 28, 77-90.
- Moran-Ellis, J., Alexander, V. D., Cronin, A., Dickinson, M., Fielding, J., Sleney, J., & Thomas, H. (2006). Triangulation and integration: processes, claims and implications. *Qualitative Research*, 6(1), 45-59. doi: 10.1177/1468794106058870
- Ntuli, P. P. (2002). Indigenous Knowledge Systems and the African Renaissance. In C. A. O. Hoppers (Ed.), *Indigenous Knowledge and the Integration of Knowledge Systems: Towards a Philosophy of Articulation*: New Africa Books (Pty) Ltd.
- Rawls, J. (1971). *A theory of justice* (Original Edition ed.). Cambridge, Massachusetts and London, England: The Belknap Press of Harvard University Press.
- Sefa Dei, G. J. & Kempf, A. . (2006). *Anti-Colonialism and Education* (G. J. Sefa Dei & A. Kempf Eds.): Sense Publishers.
- Sønsthagen, A. G. (2013). *Education in post-apartheid South Africa: A limited approach to social justice and redress*. (Master), Oslo and Akershus University College.
- Thuesen, P. R., S. (2015). *Norge Store norske leksikon* (Vol. 2015): Store norske leksikon.
- Utlendingsdirektoratet. (2014). Årsrapport 2014: Hvem fikk beskyttelse?
- World Economic Forum (2014). The global information technology report 2014: Rewards and Risks of Big Data. In D. Bilbao-Osario, S. & Lanvin, B. (Ed.). Geneva: World Economic Forum.

EDUCATIONAL LEADERSHIP IN THE CHINESE MAINLAND: A CASE STUDY OF TWO SECONDARY SCHOOLS IN BEIJING

Manhong Lai¹ & Lijia Wang²

¹The Chinese University of Hong Kong (Hong Kong)

²East China Normal University (China)

Abstract

In recent years, quality of education has been the major concern of the Ministry of Education in the Chinese Mainland. Curriculum reform was perceived to be the major measure by which to raise education quality. The reform focused on enabling students' all-round development by nurturing innovation, enhancing independent learning ability, and empowering the school to develop a school-based curriculum in addition to the national compulsory curriculum (MOE, 2003). To succeed under the new curriculum reform, teachers needed to develop new concepts of teaching and learning. Principals are requested to play a key role in guiding the developmental directions of school development, to guarantee the implementation of curriculum reform, and to facilitate school-based teacher development. By taking a qualitative research approach in two primary schools in Beijing, we can gain an in-depth understanding of how principals, middle managers, and teachers perceived the educational leadership help to guide and implement new school projects to implement the quality education and curriculum reform. Our study found that, first, principals in the two schools put traditional instructional leadership as their first priority to fulfil the directives of District Education Bureau. Second, the conservative principal employed patriarchal leadership. Teachers expected principal leadership extending concern their personal life. Third, even the comparative liberal principal hoped to distribute certain authority and responsibilities to ordinary teachers, the expected distributed leadership was blocked by middle managers. Our study contributes theoretical contribution on the international discussion on educational leadership as well as policy implications for principal development in the Chinese Mainland.

Keywords: *Educational leadership, curriculum reform, China, instructional leadership, distributed leadership*

A FAITH-BASED INTERVENTION TO IMPROVE NUTRITIONAL HABITS WITHIN AFRICAN AMERICAN AND HISPANIC POPULATIONS

Victor Romano, EdD¹, Karen L. Butler, PhD² & Elliot Royal, MS³

¹Wellness Director, Johnson C. Smith University HealthPlex, Charlotte, North Carolina, USA

²Professor of Health Education, Johnson C. Smith University Department of Health & Human Performance, Charlotte, North Carolina, USA

³Wellness Coordinator, Johnson C. Smith University HealthPlex, Charlotte, North Carolina, USA

Abstract

Background: In 2011, the Mecklenburg County Health Department reported that in Charlotte, North Carolina approximately 64% of adults were overweight or obese. Minority populations reported rates seven times higher than Caucasians in the areas of smoking, obesity, and lack of physical activity. The Village HeartBEAT (VHB) was designed to promote and enhance health and wellness, and addresses obesity and heart disease within African American and Hispanic populations. VHB is a comprehensive 16 week program that included 15 different faith-based organizations that participated in weekly weight management sessions, healthy living seminars, group exercise classes, water fitness, bi-weekly one-on-one health coaching sessions, monthly cooking demonstrations, team challenges, and personalized exercise programs. Programming was designed and implemented by Johnson C. Smith University's (JCSU) HealthPlex, a center for applied health research and host to JCSU's Wellness Department. **Methods:** All participants underwent a pre-assessment, midway mini-assessment, and post-assessment. The MicroFit HealthWizard software package assisted in the gathering and processing some of the data. Other data was gathered by attendance records and self-reported questionnaires developed by Mecklenburg County Health Department. The MicroFit HealthWizard software package assisted in the gathering and processing some of the data. Other data was gathered by attendance records and separate self-reports questionnaires developed by Mecklenburg County Health Department. **Findings:** There were 183 participants from 15 churches and 30 different communities. The majority of participants were women (86%, N = 157) and 95% (N = 173) identified as African American, with the other 5% (N = 10) identifying as Hispanic. Age ranged from 23 to 76 years with the average age being 53; and team sizes ranged from 7 to 24 members with an average of 17 members. Data indicated a total weight loss of 332.4lbs, averaging 2.8lbs per person, decreasing BMI baselines 33.18 to 32.75 (-.43). Self-report nutrition habits indicated a 27% increase in healthier food choices among participants. **Interpretation:** Participants began choosing healthier foods, and also increased participation in physical activity. This program also indicated that stress levels, and tobacco usage decreased. However the program was not long enough to positively impact health status indicators such as cholesterol, blood pressure, glucose levels, and body fat percentage. This program shows preliminary success in its short duration, but needs to be continued to show positive health status changes within the participants.

Keywords: community-based participatory research, obesity, faith-based interventions, nutrition

1. Background

Despite significant progress in reducing and eliminating racial and ethnic health disparities over the past decades, disparities continue to persist and are widening for some population groups. Chronic diseases, such as obesity, heart disease, diabetes and cancer, disproportionately affect certain populations (Healthy People 2020). For example, the adult obesity rates in the U.S. are higher among non-Hispanic African Americans and Mexican Americans than among non-Hispanic Whites. Research in the area of racial and ethnic health disparities suggests that disparities are created and maintained through various, interrelated and complex pathways. Poverty, lack of education, property neglect, tobacco use and exposure, physical inactivity, poor nutrition, and lack of access to quality health care services are some of the factors that influence health and contribute to racial and ethnic health disparities. For disadvantaged racial and ethnic populations, the exposure to risks for chronic disease exists across the lifespan, and is

often accompanied by chronic stress associated with the social and psychological experience of living in an unhealthy neighborhood and concentrated poverty conditions. An effective program to eliminate health disparities is characterized by the integration of tailored strategies across the social and physical environment of racial and ethnic communities.

Chronic disease prevention is imperative to lower mortality rates nationally and locally. Cancer, heart disease, stroke, chronic respiratory disease and diabetes were selected health indicators examined in the 2013 Mecklenburg County Summary report (2013 Mecklenburg Community Health Assessment). In comparison to North Carolina, Mecklenburg County reported good prevalence and has been improving in the last 5 years in cancer and stroke mortality. Heart disease and stroke mortality rates are fair but have been improving. Out of all 5 health indicators, diabetes is stable and hasn't changed in the last 5 years (Livingston, 2004). Mecklenburg health disparity ratios show that African Americans are more at risk than non-Hispanic whites. This tends to be associated with lack of health care access and knowledge. Chronic health indicators are severe issues nationally and locally. Diabetes is increasing with a 3 to 1 ratio of African American deaths to non-Hispanic white deaths Dietary Guidelines for Americans, 2010). It has been noted that after coming to the United States, Hispanics experience an increase risk associated with chronic disease rates associated with exercise and diet (Livingston, 2004). The American Diabetes Association projects that "50% of African American and Hispanics born since 2000 will develop diabetes." (Healthy People 2020).

Village HeartBEAT (Building Education and Accountability Together) is designed to promote better heart health awareness and to enhance community resources in a coordinated health care service model to address obesity and heart disease awareness among African American and Hispanic populations. It is designed to lower heart disease risk factors amongst African American and Hispanic residents of Mecklenburg County by:

1. Organizing a multi-partnered program to initiate community health and wellness,
2. Lower at risk factors amongst African American and Hispanic population (BMI, %body fat, blood pressure, cardiovascular output),
3. Implement a Holistic Wellness Model into the community, and
4. Implementing seven components of wellness: emotional, environmental, intellectual, occupational, physical, social, and spiritual.

The program was structured around the involvement of the Mecklenburg County Health Department (MCHD, Bethesda Health Clinic and Johnson C. Smith University's HealthPlex. Additional stakeholders contributed to the execution of the program including Novant Health, American Heart Association, A.Oronde Culinary, Zuri Productions, Johnson C. Smith University Office of Counseling Services and independent contracted group exercise instructors.

Johnson C. Smith University's Healthplex implemented and coordinated prevention and wellness programs that focus on chronic disease prevention among minorities, the uninsured, and under-served populations. The Healthplex hosted and participated in meetings with partners to finalize clinical screening requirements, recruitment strategies and data collection tools. HealthPlex staff conducted baseline, mid-program, and final health assessments of program participants that included Health History, Wellness and Fitness Profile, Blood Pressure (BP), Resting Heart Rate, Body Mass Index (BMI), Waist/Hip Ratio (WHR), Sit and Reach, YMCA Half Sit-Up Test, 1-Minute Max Push-Up Test and YMCA 3-Minute Step Test. HealthPlex staff also conducted daily tracking of facility and program usage and maintained a database of screenings for each participant to include, name, age, race, church, zip code and collected assessment information. All data was kept confidential and will be presented anonymously. The following programs were presented at the Healthplex: Physical Activities, Living Healthy Seminars, Weight Management, and Health Coaching.

The Bethesda Health Clinic served as the screening facility for the Village HeartBEAT program and was home for Camino Del Ray Church. They conducted and managed mid-program and final health screenings of program participants to include BP, Cholesterol, Glucose levels and BMI. Bethesda Health Clinic maintained a database of screenings for each participant to include, name, age, race, church, BP, Glucose levels, Cholesterol, BMI, zip code and type of referral.

Village HeartBEAT served and affected thirteen churches in Mecklenburg County (North Carolina), directly reaching 216 participants through initial assessments. Results of the program will be used for evaluation and research purposes by MCHD, Johnson C. Smith University's Healthplex and UNC Chapel Hill.

After the conclusion of the program, all village HeartBEAT participants will still have access to all programs held at Johnson C. Smith University's Healthplex.

2. Methods

2.1. Participants

The Village HeartBEAT program was one of the MCHD's focus areas of community health and safety whereby all Mecklenburg County residents can become self-sufficient and have equal access to services. While participating in the program participants would gain insight, potentially change practice, and assess effects on participant's behavior. The evaluation will be used to support the need for further community intervention programs to prevent chronic disease risk factors amongst the African American and Hispanic populations of Mecklenburg County.

Participants were male or female between 18-80 years old. It was initially requested that participants have one of the following conditions; smoker, overweight or obese, high blood pressure, high cholesterol, diabetic, or is a member of family with a history of heart disease.

The demographics of Mecklenburg County are changing and becoming increasingly more diverse. Mecklenburg County consists of a large urban center surrounded by smaller, more rural communities with a population of 990,977 (2013 Census estimate). A racial/ethnic demographic profile of the county estimates the population to be: 60.1% white, non-Hispanic; 31.8% African-American, non-Hispanic; <1% American Indian and Alaska Native, non-Hispanic; 5.1% Asian, non-Hispanic and 2.2% persons of multiple of race, non-Hispanic. The percentage of Hispanics has increased from 6.5% (2000) to 12.2% in 2010.

2.2. Assessment tools

Assessments included Health History, Wellness and Fitness Profile, Blood Pressure (BP), Resting Heart Rate, Body Measurements, Waist/Hip Ratio (WHR), Body Composition, Sit and Reach, YMCA Half Sit-Up Test, 1-Minute Max Push-Up Test and YMCA 3-Minute Step Test. The MicroFit software was used to gather and analyze the data.

An orientation was held to provide all participants and opportunity to address questions and comments about the program. The Johnson C. Smith University HealthPlex hosted the Saturday meeting that allowed all participants to be introduced to the staff they would be working with in the upcoming program. At the meeting Captains' & Health Coach Responsibilities and Village HeartBEAT rules and regulations were provided. Additional physical activity programs were incorporated in the HealthPlex schedule. A team physical challenge event was conducted near the end of the program to include weigh-in, final screenings and awards. The HealthPlex added 4 group exercise classes to their schedule to accommodate the Village HeartBEAT program. Classes were offered on Monday nights. Class options varied weekly. The classes included Low Impact Fitness, Zumba, cardio Funk, Beginners Yoga and an evening Water Fitness Class. Living Healthy Seminars were designated as "Wellness Wednesdays". Weekly presentations were conducted by credentialed presenters from Urban Housecall, American Heart Association, A.Oronode Culinary, Johnson C. Smith University's Office of Counseling Services, Healthplex Staff and a Mecklenburg County Dietitian. Living Healthy Seminar Series were scheduled at different times of the day to accommodate various schedules. The Living Healthy Seminar Series provided a variety of topics to that were relevant to promote a positive sense of well-being. A.Oronode Culinary services were acquired to conduct cooking demonstrations for participants. All meals were nutritional and proportionate. A.Oronode Culinary provided recipe cards for every demonstration so that meals could be replicated. Weight Management Weight Management was a 16 week program that offers weight loss assistance. The program was broken down into three stages; Weight Loss Basics, Sharpening Your Weight Management Skills, and Long-Term Weight Management. The Health Coaching program was implemented to help overcome the barriers that can interfere with health and wellness. Like traditional coaching, health coaches utilized goal setting, identification of obstacles, and use of personal support systems.

3. Findings

There were 183 participants from 13 churches and 30 different communities. The majority of participants were women (86%, N = 157) and 95% (N = 173) identified as African American, with the other 5% (N = 10) identifying as Hispanic. Age ranged from 23 to 76 years with the average age being 53; and team sizes ranged from 7 to 24 members with an average of 17 members.

Data indicated a total weight loss of 332.4lbs, averaging 2.8lbs per person, decreasing BMI baselines 33.18 to 32.75 (-.43). Self-report nutrition habits indicated a 27% increase in healthier food choices among participants. These included increasing fruit and vegetable consumption, increasing fiber intake, and decreasing fat intake. In addition, 30% more of the participants were meeting the U.S.

standards for physical activity (30 minutes, 3 or more times a week at a quite vigorous level). Further analysis of the data is currently being conducted.

4. Interpretation

Participants began choosing healthier foods, and also increased participation in physical activity. This program also indicated that stress levels, and tobacco usage decreased. However the program was not long enough to positively impact health status indicators such as cholesterol, blood pressure, glucose levels, and body fat percentage. This program shows preliminary success in its short duration, but needs to be continued to show positive health status changes within the participants.

Village HeartBEAT used cultural framework to address health disparities among African Americans and Hispanics. To successfully implement a preventive health education program, key constructs must be addressed. Culture is learned, transmitted and adapted. These three constructs of culture can be used to emphasize the need for Cultural Health Assessment Framework that will enable the deeper investigation of health disparities amongst a specific population. The Village HeartBEAT program addressed African American and Hispanic cultures in a trustworthy setting, faith based congregations. By partnering with faith based congregations, the MCHD is able to provide health education to eliminate negative perceptions that is received through verbal and nonverbal communication.

References

- Dietary Guidelines for Americans (2010). Office of Disease Prevention and Health Promotion. Available: <http://www.health.gov/dietaryguidelines/2010.asp> Retrieved May 25, 2015.
- Healthy People 2020: Nutrition, physical activity & obesity. Available: <http://www.healthypeople.gov/2020/leading-health-indicators/2020-lhi-topics/Nutrition-Physical-Activity-and-Obesity/determinants> Retrieved May 25, 2015.
- Livingston, I.L. (2004). *Praeger handbook of Black American health: Policies & issues behind disparities in health* (2nd ed.). Westport, CT: Praeger Publishers.
- 2013 Mecklenburg Community Health Assessment: Summary Report. Available: <http://charmeck.org/mecklenburg/county/HealthDepartment/HealthStatistics/Documents/2013%20CHA%20Fact%20Sheets.pdf> Retrieved May 25, 2015.

MAKING USE OF THE EXTERNAL EVALUATION REPORT IN SCHOOL'S WORK IMPROVEMENT

Joanna Kołodziejczyk

Institute of Public Affairs, Jagiellonian University (Poland)

Abstract

In Poland, since 2009, obligatory external evaluations have been carried out. The aim of the inspections is to provide schools with information useful for the improvement of their work. The evaluation may comprise all or selected educational standards listed in the Regulation on pedagogical supervision. The participants of the inspection are students, teachers, principals, non-teaching staff, students' parents, representatives of local authorities and school's partners, mainly institutions from the local environment that cooperate with the school. The report that is created after the evaluation is supposed to provoke reflection on how educational processes in school are perceived by various subjects and actions that would help improve them. It is, then, one of the important tools that can be used in contemporary data-based school management. The article discusses the results of the research concerning the usefulness of the report for school work improvement. It presents the educational standards as the object of the inspections, the opinions of principals and teachers on the usefulness of the external evaluation report and the results of other research carried out in this area.

Keywords: *external evaluation, evaluation report, school work improvement*

1. Introduction

Evaluation as a type of social research may be used for the improvement of the quality of school work. That was also the objective formulated in 2009 during the modernization of the pedagogical supervision plan in Poland, when evaluation was introduced as a form of pedagogical supervision along with the inspection of the compliance of the educational institutions' operations with the law and the support and monitoring of schools' and institutions' operations.

The subject of external evaluations is the formulated educational standards. In the case of schools, educational standards comprise 12 issues considered to be of key importance for the schools' functioning. They refer, inter alia, to the pupils' activity, their acquisition of knowledge and skills specified in the core curriculum, respect of social standards, support of the pupils' development, cooperation with the pupils' parents, and organization of the educational processes in a manner fostering the learning process. External evaluation may comprise all standards (so-called comprehensive evaluation) or selected standards (so-called problem evaluation). As a multi-stage activity, evaluation comprises data collection and analysis, the determination in the course of analysis of the schools' standard fulfilment rate, the preparation of evaluation reports and communication with schools in connection with the report presentation and a discussion on the evaluation results and conclusions.

2. The external evaluation concept in Polish schools and the processes of educational management and leadership

The external evaluation model effective in Poland is based on the dialogical and developmental evaluation concept (Mazurkiewicz & Berdzik 2010). One of the ideas of the dialogical and developmental evaluation is the socialization of the conducted examination, or the interactive nature of the evaluation process (Guba & Lincoln 1989). This is reflected in the participation of the school's stakeholders in each stage of the external evaluation process. In the course of the process, various perspectives and various interpretations of phenomena and situations are taken into consideration, in accordance with the assumptions of constructivism in which the complexity of the examined reality is determined by the perspective of the subjects of the cognition process. The transparency of the examination should also foster the dialogical nature thereof (Mazurkiewicz & Berdzik 2010), therefore the entire evaluation

process is open and transparent: the subject and course of evaluation, the applied tools, the report available in the Internet (www.npseo.pl). In the currently effective external evaluation model participation or the stakeholders' involvement in the process is emphasised. It is a step towards the opening of the evaluation process to fulfilling the stakeholders' information demands. At present, the stakeholders do not decide about the evaluation areas and do not participate in the creation of the conceptualization of evaluation carried out in their schools. Neither do they participate in the conclusion formulation process. A barrier in the implementation of the dialogical evaluation concept is also the requirement of determining the school's standard fulfilment rate, which results in some evident pathologies of this process (Kołodziejczyk 2013).

Since 2009 observations of the ongoing evaluation process have been carried out parallel to the introduction of many changes in the evaluation project itself, and thus, at least to some extent, the developmental evaluation postulates (Patton 2011) have been taken into consideration, emphasising the meta-evaluation component and the modification of the conceptualization of the evaluation depending on the stakeholders' needs - in the case of external evaluation, the changes have been implemented in a system, not a unit examination.

Conducting evaluation in accordance with the proposed model may foster the initiation of developmental processes, and thus should be included in the school management area. Yet, clear application limitations can be observed here. The acceptance of the proposed model of dialogical evaluation and its use in the organization's improvement may be connected with encountering barriers resulting, inter alia, from the adopted school management concept. It is worth observing that the ideas and values important in the evaluation process are equally important in the participatory management concept, but they are alien to such methods as formalization-based management. Another problem is the attempt to transfer business management knowledge directly to the school management area, disregarding or insufficiently regarding the specific character of this management sub-discipline (Dorczak 2012, Kołodziejczyk 2015). The difficulty of accepting the external evaluation model may also result from the manner of the educational leaders' thinking of such fundamental notions in education as human development, which is emphasised in literature dedicated to educational management issues (cf. Dorczak 2012). Dialogical evaluation in education may therefore be treated as a foreign body, a concept which cannot be understood due to its characteristics, and to put it broadly, the values on which it is developed, unless these are consistent with the management concept implemented in the school and the educational leadership concept. Depending on the adopted leadership model, the elements constituting the dialogic and developmental evaluation will either be considered to be an imminent element of leadership (e.g. in emancipation models or those related to the empowerment category - based on equality, dialogue, social justice, cooperation in co-management) or rejected - e.g. in the normative-instrumental model in which teachers are objectified as those who execute the head teacher's vision (Michalak 2007). It is also worth noticing that research concerning the leadership competencies of the managing personnel of Polish schools and institutions indicates that 97.7% of the head teachers perceive the competence of providing teachers and other employees with useful feedback information thanks to evaluation and assessment as being important for educational leadership. Only 0.7% of respondents considered it to be insignificant (*Report on the leadership competencies of the managing personnel of Polish schools and institutions*).

3. The use of an external evaluation report in Polish schools

The report should be a carrier and reflection of the values on which external evaluation is founded, and the information included therein should foster the decision-making process supporting the school development. It is a tool that can enhance or initiate changes in schools (Kasprzak 2012). Selected problems connected with the use of the report by schools will be presented in the following part of the paper.

The textological and communicative-linguistic analysis of the reports indicates that various types of mistakes can be found in them, making their reception difficult (Udzik 2013). These include, for instance, a very detailed description (e.g. mentioning all the respondents' statements) or excessively developed syntactic structures disrupting the text's communicativeness due to the mistakes and syntactic errors appearing in them. The absence of linguistic precision and the absence of information concerning the areas that should be corrected is also emphasised. Some of the schools do not know how to continue their work with the report; the difficulty refers to the report analysis and implementation of recommendations. In this aspect, emphasis is put on the generality of statements and conclusions, and the repeated information on one topic (Wlazole et al., an unpublished report). The difficult language and the report's extensiveness are also pointed out, as well as the fact that it is written without any tables, diagrams, graphic elements, summaries or partial conclusions, and that there are some inaccuracies and factual errors in it (Wasilewska et al. 2014).

Simultaneously, research shows that the report is perceived as a rich source of knowledge of the school, containing detailed in-depth information concerning the evaluation, presenting various groups' opinions about the school, written in a comprehensible language, and thus making a good reading; that it is clear, contains an exact and unequivocal message, is objective and easily available (Wasilewska et al. 2014).

With respect to the report's usefulness, its main recipients' assessment is important here. According to analyses carried out in this area, in post-evaluation questionnaires completed after the evaluation, 94.4% of school and institution head teachers and teachers (N=23 162) found the report to be useful in the school's or institution's work (Walczak, an unpublished report). The research referred to the period from 1.12.2011 to 31.08.2014. Previous analyses concerning the reception of evaluations carried out in the school year of 2010/2011 also proved that the assessment of the report's usefulness was high. The respondents stated that the report was useful in the school's/institution's work - 89.6% for N=2150; that the discussion on the report was helpful in determining the directions of development - 84% for N = 1100; that the report accurately reflected the school's/institution's image - 83.38% for N=1107 (Kołodziejczyk 2011). It should be added here, however, that the research does not meet the representativeness criteria; the conclusions may be referred only to those schools which were willing to participate in the research (Walczak, an unpublished report).

As it ensues from the conducted research, schools use the evaluation results and conclusions to improve their work in different ways (Wasilewska et al. 2014, Wlazło et al., an unpublished report). According to the authors of one of the reports, external evaluation is an impulse to introduce qualitative changes in schools to a small extent only. At this stage of their functioning, schools are looking for confirmation that their work deserves recognition, and at the same time, such recognition makes them passive (Wlazło et al., an unpublished report). Another report concerning the use of external and internal evaluation by schools shows that all of the evaluated schools implemented some activities in various areas of their functioning, following the external evaluation. In the majority of these schools activities related to cooperation with the pupils' parents were implemented, and the effects of the changes were considered to be quite unsatisfactory in most of the schools. The activities in this area comprised for instance: the organization of various types of meetings for parents, encouraging them to participate in school events, introducing new forms of contacts, changing the form of message addressed to the parents and involving them in consultations. Another area with satisfactory effects was school promotion (which may be surprising since the requirements do not refer to this issue - it is the educational values that ought to be promoted, not the marketing activities). Some activities concerning the didactic and educational issues were also undertaken, e.g. increasing the attractiveness of classes, expanding the scope of applied activation methods, changing the school's offer, increasing the number of additional extracurricular classes and activities aiming at safety improvement and the development of pupils' attitudes. In some of the evaluated schools activities related to the analysis of test and examination results and activities related to the method of pupils' diagnosing were implemented. The influence of evaluation on undertaking internal evaluation activities was also assessed positively. Sporadically, the respondents mentioned the influence of evaluation on such areas as school management or the change of the concept of the school's work.

The influence of the evaluation process on the changes taking place in schools is also mentioned in the research. External evaluation influenced the work of the teachers board, cooperation between teachers is more appreciated, and an improvement of relations and increased information exchange is observed (Wasilewska et al. 2014). Similar conclusions were reached by the authors of another report, according to whom the evaluation effects are of a "soft" nature. They do not mention the use of the report but actually the significance of the evaluation process. These "soft" effects, according to the report's authors, include the integration of the teaching staff, a stronger sense of responsibility for the school, the pupils' greater interest in the school (as an entirety) and better cooperation with the social partners (Wlazło et al., an unpublished report).

According to the research, the negative effects ensuing not so much from the report but from the evaluation itself comprise in particular stress and negative emotions accompanying the evaluation, the teaching staff's tiredness and work intensity, disorganization of the didactic and educational work, a negative perception of the external evaluation, and a changed attitude to subsequent evaluations (Wasilewska et al. 2014).

4. Conclusion

The conducted research shows both the positive reception of the report and the barriers hindering its use. The report is used in various areas of the school's functioning, but the scope and manner of its use

in the improvement of the school's work seems unsatisfactory so far. As the research indicates, it is significant that apart from the report, the evaluation process itself also influences the changes in schools.

References

- Dorczak, R. (2012). Specyfika zarządzania w edukacji–rozwój indywidualny człowieka jako wartość centralna”. [The Specificity of Management in Education - Human Individual Development as A Central Value] *Zarządzanie Publiczne Zeszyty Instytutu Spraw Publicznych UJ*, 3 (19), 39-47.
- Guba, E.G. & Lincoln, Y.S. (1989). *Fourth Generation Evaluation*, London: Sage.
- Kasprzak, T. (2012). *Ewaluacja dla rozwoju. Raport jako dialog [Evaluation for Development. A Report as a Dialogue]*. In: Mazurkiewicz G. (Eds.) *Jak być jeszcze lepszym? Ewaluacja w edukacji*. Kraków: Wydawnictwo Uniwersytetu Jagiellońskiego.
- Kołodziejczyk, J. (2011). *Recepcja procesu ewaluacji zewnętrznej w szkołach i placówkach edukacyjnych [The Reception of the External Evaluation Process in Schools and Educational Institutions]*. In: G. Mazurkiewicz (ed.) *Ewaluacja w nadzorze pedagogicznym. Refleksje*. Kraków: Wydawnictwo Uniwersytetu Jagiellońskiego.
- Kołodziejczyk, J. (2013). *Between Evaluation and Assessment – the Concept of External Evaluation at Polish Schools*, ICERI2013 Proceedings, Seville, Spain.
- Kołodziejczyk, J. (2015) Leadership and Management in the Definitions of School Heads. *Athens Journal of Education* 2(2), 123-135.
- Mazurkiewicz, G. & Berdzik, J. (2010). *System ewaluacji oświaty: model i procedura ewaluacji zewnętrznej [The Educational Evaluation System: the Model and the Procedure of External Evaluation]*. In: Mazurkiewicz, G. (Eds.). *Ewaluacja w nadzorze pedagogicznym. Odpowiedzialność*. Kraków: Wydawnictwo Uniwersytetu Jagiellońskiego.
- Michalak, J.M. (2007) *Istota i modele przywództwa szkolnego [The Essence and Models of School Leadership]*. In: Michalak, J.M. (Eds.) *Przywództwo w szkole*. Kraków: Oficyna Wydawnicza Impuls.
- Patton, M.Q. (2011) *Developmental Evaluation. Applying Complexity Concepts to Enhance Innovation and Use* New York, London: The Guilford Press.
- Report on the leadership competencies of the managing personnel of Polish schools and institutions* (unpublished report). Project: Leadership and management in education – creating and implementing the system of training and development for heads of schools/institutions.
- The Regulation of the Minister of National Education of 7 October 2009 concerning pedagogical supervision (Journal of Laws of 9 October 2009).
- Udzik, B. (2013). *Raport z ewaluacji zewnętrznej jako komunikat [A Report on External Evaluation as a Message]* In: Niemierko, B. & Szmigiel, M.K. (Eds.) *Polska edukacja w świetle diagnoz prowadzonych w różnych perspektyw badawczych, XIX Krajowa Konferencja Diagnostyki Edukacyjnej* Gniezno, 26-28 września 2013. Kraków: GRUPA TOMAMI.
- Walczak, B. *Ewaluacja oczami szkoły [Evaluation in the Eyes of the School]*, unpublished report. Programme for the reinforcement of paedagogical supervision system and school work quality assessment
- Wasilewska, O., Rybińska A. & Muzyk A. (2014). *Wykorzystanie ewaluacji zewnętrznej i wewnętrznej przez szkoły [The Use of External and Internal Evaluation by Schools]*. Warszawa: Instytut Badań Edukacyjnych.
- Wlazło, S., Elsner, D., Bednarek, K., Kluz, Ł. & Halska, E. *Zmiany spowodowane ewaluacją zewnętrzną w szkołach i placówkach oświatowych województw: dolnośląskiego, opolskiego i śląskiego [The Changes Caused by External Evaluation in the Schools and Educational Institutions in the Dolnośląskie, Opolskie and Śląskie Provinces]*. Research report (unpublished). Project: Programme for the reinforcement of paedagogical supervision system and school work quality assessment

THE PATHWAYS OF LEADERSHIP'S INDIRECT INFLUENCE ON STUDENTS' LEARNING PROCESSES

Jakub Kołodziejczyk

Institute of Public Affairs, Jagiellonian University (Poland)

Abstract

A head teacher acting in the capacity of an educational leader exerts an indirect influence on pupils' learning processes. Relying to a considerable degree on the analysis of factors determining the achievement of Hattie's students, Leithwood et al. (2009) identified four paths allowing a head teacher to exert impact on students' learning processes through his/her actions. They are the rational path, the emotions path, the organisation path, and the family path. The objective of the research was to answer the following question: which tasks in the area of teaching and learning activities do head teachers consider as the most important? Preparing an answer to this question, the author relied on data collected during in-depth interviews (IDI) with 170 head teachers of Polish schools. The interviews were conducted within the scope of the project entitled *Educational Leadership*, whose objective is to prepare a training and development system for head teachers. Opinions acquired during the interviews underwent a qualitative analysis (an analysis of the content) in an attempt to isolate particular activities undertaken by head teachers with respect to the four paths of influencing students' learning processes: the rational path, the emotions path, the organisation path, and the family path.

Keywords: *Head teacher, leadership, educational leadership, school organizational factors.*

1. Introduction

Students' learning is the main task and mission of all educational institutions so for those leading these organizations there is nothing more important than concentrating all efforts on creating an environment that would foster learning. The understanding of the role of a school head as a leader of the process of learning is reflected in the term 'head teacher' itself. It highlights the role of a school head as the 'first teacher' who should concentrate on achieving goals concerned with teaching and educating students in the first place. The leading role should stem from high pedagogical competences of a school head (constantly improved and practiced) that allow him or her to be the role model for other teachers and serve them as a mentor and inspiration for professional development.

The literature discusses also the type of influence exerted by the school head in the process of learning in school, namely its direct or indirect character. Some research indicates that the direct influence of a school head on educational attainments is very low or almost none; for instance Witziers et al. (2003) discovered little direct influence of school leadership on students' attainments in primary schools but the effect was not observed in secondary schools. However, most of the recent research point at the indirect influence of school heads that is exerted mainly through support given to teachers (Leithwood & Mascal 2008; Louis et al. 2010).

2. The influence of school heads on learning

The literature proposes a few approaches (conceptualizations) to the way of describing how school heads indirectly influence school work. House (1981; as cited in Leithwood et al. 2010) discussed three strategic ways (technical, political, cultural) in which a school head influences school's development. In turn, Alava et al. (2012), basing on the conception of pedagogical leadership, point at four processes through which a leader influences learning in school: curriculum, organizational culture, vision and strategies, school basic mission.

Another approach, used for the purpose of the present study, is presented by Leithwood et al. (2010), who, basing mainly on Hattie's analyses, pointed at four paths that allow school heads to

influence students' learning through their actions. They name the paths as follows: the rational path, the emotional path, the organizational path and the family path.

- The rational path – is embedded in teachers' knowledge and skills in the areas of the curricula, teaching and learning. It concerns factors occurring both on the class level (e.g. teaching strategies, feedback, teacher-student relations, class managing) and on the school level (e.g. school climate, academic press)
- The emotional path – is connected to the discovery of a direct link between emotions and cognition (the structure of perception, attention, memory). Emotions play a role in teachers practice too, affecting methods applied in the classroom and students' learning, and are connected to individual and group efficiency. Building trust between teachers, students and parents is of particular importance in this path.
- The organizational path – consists of elements such as the organizational structure, school culture, strategies and applied operational procedures that make up a specific school infrastructure. Good organization enables making use of all the potential gathered in school, evoking positive emotions and turning individual learning into collective learning.
- The family path – is a group of factors affecting educational results that are located in the student's family and that are of great importance but they are often ignored. Among these factors we can name family environment, parents' involvement in the school life, time spent watching TV, school staff's visits in the student's home and parents' aspirations.

Factors located in one path are linked to those in the other three and influence one another mutually. For instance, work organization based on team work (the organizational path) affects teachers' emotions. Factors occurring in each path translate into the practice applied on the level of the entire school and of particular classes, which makes them affect the learning processes of both students and teachers or other school staff members.

The objective of the research is to find the answer to the question what tasks concerning teaching and learning are considered the most important by school heads.

3. The methodology of the research

The presented analyses are a part of a broader study concerning school leadership, carried out within the *Educational Leadership* EU-funded project whose aim is to create a system of training and development for educational leaders in Poland. The research is based on a mixed research methodology, using tools allowing to gather both quantity and quality data. In the first stage of the research, all school heads in Poland were invited to fill an electronic survey where they were asked to assess the importance of various competences for educational leadership and the level at which they believed they had these competences. The competences listed in the survey were established through an analysis of the existing literature. 2824 (ca. 8%) heads of educational institutions in Poland responded to the invitation. In the second stage of the research, a representative sample of 170 school heads were randomly selected for in-depth interviews (IDI).

3.1. The surveyed group

170 heads that participated in the research were:

- from different school types: nursery schools – 17 (10%), primary schools – 64 (37%), secondary schools – 18 (11%), high schools – 38 (22%), school complexes – 28 (16%), other – 6 (4%);
- of different length of service as a school head: under 5 years – 48 (28%), 6 to 10 years – 55 (32%), 11 to 15 years – 39 (23%), over 15 years – 29 (17%);
- of different gender: female – 132 (77%), male – 39 (23%).

3.2. Tools

The analyzed data comes from individual in-depth interviews carried out with school heads during the summer holidays in 2013 in locations they proposed (mostly in their offices). The interviews were composed of three parts: the questions in the first part concerned the understanding of the notions of *leadership* and *management* and the relation between these notions; in the second part, the questions concerned the understanding of the key areas of educational leadership; the third part was focused on deepening the awareness of leader competences that the respondent considered his or her strengths or weaknesses and on possible way of developing these competences.

3.3. The methods of the analysis

For the purpose of this analysis we used the answers given to the questions in the second part of the interviews: What in your opinion is the most important task of the school head in the area of managing teaching and learning processes? The analysis of the material gathered this way consisted in establishing the frequency of responses naming school head's tasks corresponding with the path of the leader's indirect influence (rational, organizational, emotional, family). The school head's tasks were matched with the paths on the basis of the descriptions presented above.

In the cases of 31 responses out of 170 it was impossible to determine school head's tasks.

4. The results

Some of the school heads' statements show their awareness of the indirect influence on students' learning exerted through teachers:

The school head does not work with students directly but teachers do and the school head influences them by his attitude and makes them work more efficiently. (2174)

In the analyzed material, all four paths of school head's indirect influence on students' attainments, assumed by Leithwood, Anderson, Mascall, Strauss (2009), were found but they varied in frequency of occurrence (Table 1).

Table 1. The frequency of occurrence of the paths of school head's indirect influence on teaching and learning (n=139)

Path	Frq.	%
Organizational	103	74,1%
Rational	58	41,7%
Emotional	29	20,9%
Family	1	0,7%

Most school heads (103 or 74.1%) see their influence on teaching and learning in school through the organizational path. Their statements contain a few different types of actions. Some of them are connected to providing the right working conditions for teachers and students (... *as a school head, I am responsible for what the teachers have at their disposal*), others – to the processes of teachers' recruitment and professional development (*Making really sure that the teachers are well trained and develop their skills*); the third group consists of statements concerning the teachers and students work schedule (*There are issues connected to establishing the timetables*).

The rational path was the second most frequently mentioned in the answers (58 or 41%). It mainly includes two types of school heads' statements. The first are connected to the objectives of teaching and to the curricula (*helping teachers understand certain ideas, the curricula and the objectives of education*), the second concern the teaching methods applied during lessons (*That is demonstrating ways and methods of learning*). Almost 21% of the school heads mentioned actions that were qualified as the emotional path. The school heads underlined the role of highlighting students' achievements, recognizing their needs and interests and using them to evoke their motivation.

*As to students' learning, we should take their needs into account. Young people are great when we let them act and speak and when we listen to them, try to meet their expectations.
...it is mainly motivating students to intellectual effort, to studying, and showing them why it is good to study, why they should study.*

The family environment appears in many school heads' statements as an important factor affecting students' learning. However, in most of them, the school heads point at the influence of the family environment on students' development and they say that in consequence, teachers should try to get to know it as it might be useful in the educational process. *First, recognizing what the needs of students and parents are, then, creating an educational offer that would meet those needs*. For that reason, these answers were qualified as the rational path. One of the respondents mentioned the necessity of involving parents in cooperation:

If we don't cooperate and require the same things from the children (as they spend half of their time at home and the other half in school), we will have a problem, and that's why cooperation between school and parents is so important.

5. Conclusions

The importance of tasks connected to organizing the school work might be the result of the fact that the school head's role is dominated by managerial tasks, focusing on planning and financing actions in a short perspective (Kotter 1990). It is necessary for the school head to perform this function but it is disturbing that tasks associated with the leader's role are significantly less frequent in the responses; these include showing directions for school's actions (rational path) and motivating to act and learn (emotional path). The fact that the school heads neglect the family path as a possible way of influencing students' attainments is coherent with the results of other studies that show that parents are involved in schools mostly in service activities (organizing trips, school celebrations, financing activities or prizes) and that they support or participate in the process of learning to a very small extent (Kołodziejczyk 2014).

It is also interesting to analyze those potential factors of school heads' influence that are missing in the analyzed statements in the context of the theoretical model. Among the factors connected to the emotional path school heads mention encouraging teachers to make use of emotions connected to students' interests as one of their tasks. Motivation and emotions that evoke it are seen as the result of students' interests. In turn, school heads did not mention tasks connected to building trust between teachers, students and parents, put forward by Leithwood et al. (2009). Neither did they mention tasks connected to developing cooperation between teachers.

It does not necessarily mean that school heads do not notice the 'missing' tasks mentioned above but they do not see a direct link between these tasks and teaching or learning in school. Building trust is a good example, as it is mentioned by school heads in contexts other than influencing teaching and learning (Kołodziejczyk, Trzópek-Paszkiewicz 2014).

References

- Alava, J., Halttunen, L., & Risku, M. (2012). Changing School Management. Retrieved 28.03.2015, from: http://www.opintonetti.fi/download/146781_Changing_school_management.pdf
- Dumant H., Instance D., Benavides, F. (red.) (2013) Istota uczenia się. Wykorzystanie wyników badań w praktyce, Wolters Kluwer, Warszawa.
- House, E. (19981) Three perspectives on innovation: technological, political, and cultural, in R. Lehming and M. Kane (eds), *Improving Schools: Using What We Know*. Beverly Hills, CA: Sage. P. 17-41.
- Kołodziejczyk, J., (2014) *Rodzice o swoim zaangażowaniu w edukację szkolną dzieci*, w: G. Mazurkiewicz, A. Gocłowska, (red.), Jakość edukacji. Dane i wnioski z ewaluacji zewnętrznych przeprowadzonych w latach 2013-2014. Kraków: Wydawnictwo Uniwersytetu Jagiellońskiego.
- Kołodziejczyk, J., Trzópek-Paszkiewicz, J., (2014). *Trust in selected head teachers' competencies - research reports*. Presentation 23rd ENIRDELM Conference, More Trust, less Control – less Work? Culture of Trust as a Basis of Educational Leadership and School Improvement.
- Kotter, J.P. (1990) *A force for change. How Leadership Differs From Management*. The Free Press, New York.
- Leithwood, K., Anderson, S.E., Mascal, B., Strauss, T. (2010) School Leaders' Influences on Student Learning: The Four Path, w: Bush T., Bell L., Middlewood D., *The Principles of Educational Leadership and Management*, SAGE
- Leithwood, K., Mascal B. (2008) Collective leadership effects on student achievement. *Educational Administration Quarterly*, 44(4), 529-561.
- Louis, K.S., Dretzke, B., Wahlstrom, K. (2010) How does leadership affect student achievement? Results from a national US survey, *School Effectiveness and School Improvement*, 21(3), 315–336.
- Witziers, B., Bosker, R.J., Kruger, M.L. (2003) Educational leadership and student achievement: The elusive search for an association. *Educational Administration Quarterly*, 39(3), 398-425.

THE PASSAGE FROM TEACHING TO ADMINISTRATION: SOCIALISATION OF VICE-PRINCIPALS IN HONG KONG

Paula Kwan

The Chinese University of Hong Kong (Hong Kong)

Abstract

The position of Assistant Principal (AP) is the gateway to the school management apex for teachers, representing a significant milestone in his/her career. Although the promotion is seen as a logical career movement, the adjustment for the new role is not without challenges to new APs. New job holders usually experience high level of uncertainty when they first take up the job and they undergo a process of socialisation to transit from the teaching role to the new administrative role. Drawing on the developmental stage theory, the proposed study seeks to understand the socialization process of beginning APs in Hong Kong. This study attempts to explore the effect of school contextual factors and personal demographic factors on AP's self-efficacy in undertaking the new role, based on a Hong Kong data set. It also attempts to examine the diversity among VPs at different developmental stages. Implications of findings to school leadership development will be addressed.

Keywords: *Vice-principals, Socialisation, Role Efficacy, Hong Kong.*

1. Introduction

The labelling of Assistant Principals (AP) as “forgotten leaders” (Cranston, Tronmans & Reugebrink, 2004) suggests that they have been under-represented in the literature; it is only until lately that researchers have started to examine their assistance rendered to principals to undertake the proliferated set of responsibilities entrusted to school management in the wake of school reforms. Recent research on APs internationally and in Hong Kong has confirmed that their roles span both educational leadership and operational administration (e.g. Hausman, Nebeker & McCreary, J., 2002; Kwan & Walker, 2008).

Having been traditionally trained for and preoccupied with student-focused and curriculum-related issues in their early career, VPs in Hong Kong (HK) were found lacking training to undertake the extended job portfolio and having difficulties to adjust to their changing roles (Kwan, 2009a). The apparent lack of competency of HK novice APs to cope with their jobs has been further exacerbated by their being accustomed to a stable career path. It is not uncommon to find a teacher who has worked in one school (or in schools run by the same school sponsoring body) for his/her entire professional life (Lam, 2003). The promotion of a teacher to AP often triggers an abrupt change in the prevailing hierarchical structure in a school given the low staff mobility. The novice AP is no longer seen by his/her peer teachers as a colleague but as a supervisor. In a high power-distance culture, followers often choose to maintain a minimum level of interactions with the leader for various reasons such as to avoid being seen as apple-polishing (Westwood, 1997). Therefore, VPs often find it psychological difficult to adjust to the new role (Kwan, 2011). In addition, HK APs are often tasked with thorny staffing responsibilities by their principals who wish to maintain a harmonious working relationship with the teachers and thus using them as buffers (Kwan, 2009b). Therefore, novice APs not only have to be conversant with the professional and technical knowledge to discharge the expanded responsibilities with which he/she is not familiar, but also to gain acceptance by their peers as a leader.

Socialization is the process of learning a new role; it takes place whenever an employee crosses an organizational boundary, whether this is external (i.e. between organizations) or internal (e.g. functional and/or hierarchical) (Van Mannen & Schien, 1979). New job holders usually experience high levels of uncertainty during the organizational entry process and are motivated to reduce their uncertainty to make the work environment becomes more predictable, understandable and ultimately controllable. The literature identifies two types of socialization in general: professional and organisational. The former

provides the knowledge, skills, and values that an individual will need to undertake the new roles and responsibilities, and the latter focuses on the specific context where the role is being performed.

The literature recognizes that school leaders pass through a number of stages in the socialization process with a different socialization need at each of the stages. Although there is a lack of agreement on the number of stages involved, such as Mertz (2006) proposes four whereas Weindling (1999) advocates six, the three stages of initiation, transition, and incorporation appear to be the common theme (Chen & Klimoski, 2003). It is also recognised that the level of anxiety of a job holder will progressively decrease with his growing familiarity with the work environment.

Crow (2007) maintains that headteachers meetings, new headteachers briefings and courses are useful sources of socialization for beginning principals to talk through problems and clarifying thinking. He further supports the important role of people as sources of socialization; the predecessor principal, the deputy, and key staff members are core elements influencing the socialization of beginning principals both positively and negatively. On the one hand they serve as sounding boards and offer expert advice, but they create problems and withholding information on the other.

In addition to seniors' support, the acceptance of colleagues is of equal importance to VPs in adjusting to the new role in the light of the specific cultural context of HK as previously discussed. Kwan (2009b) reported that VPs' job satisfaction was positively linked to their capacity in maintaining a harmonious working relationship in schools.

2. Objectives

This study aimed to understand the following two objectives:

1. What is the respective effect of school contextual factors (i.e. principal's support, colleagues' acceptance and school feedback mechanisms) on VPs' self-efficacy?
2. Will the effect of these contextual factors on VP's self-efficacy differ across 3 groups of informants in different developmental stages?

3. Methods

A quantitative methodology was used. A questionnaire for measuring the four constructs (principal's support, colleagues' acceptance, school feedback mechanisms and self-efficacy) was sent to VPs in all Hong Kong primary and secondary schools. A total of 577 replies was received, representing a response rate of 40.8%. Only those informants with less than 3 years of VPs were included in this analysis; there were 210 of them. A summary of the informants' profiles is given in Table 1.

Table 1. Summary of respondent profiles

School Variables					
School Size	24 classes or below	25 to 30 classes		30 classes or above	
	76 (36.2%)	103 (49.0%)		31 (14.8%)	
Student Academic Ability	V. Weak	Weak	Average	Strong	V. Strong
	16 (7.61%)	32 (15.24%)	74 (35.24%)	64 (30.48%)	24 (11.43%)
Personal Variables					
Gender	Male		Female		
	96 (45.71%)		114 (54.29%)		
Years of Experience in vice-principalship	Less than 1		Between 1 to 2		Between 2 to 3
	78 (36.19%)		75 (35.71%)		59 (28.10%)

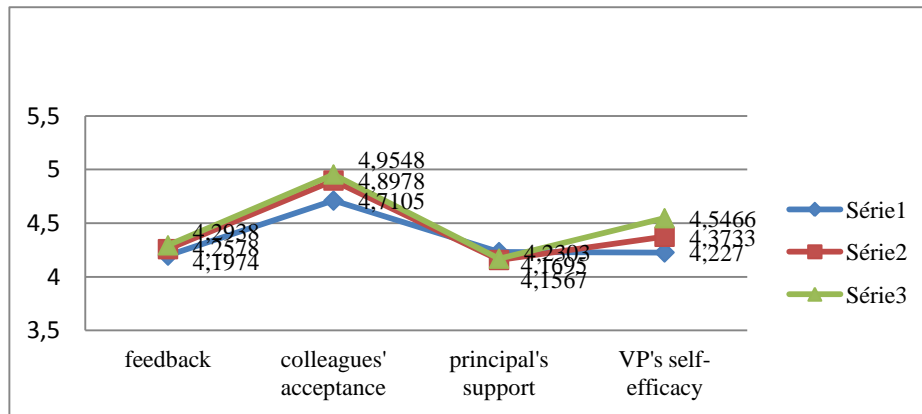
The questionnaire consisted of 14 items; the constructs of feedback mechanisms and colleagues' acceptance were each measured by 3 items and the constructs of principal's support and self-efficacy were by 4 items each. With the exception of the instrument for measuring self-efficacy which was adapted from Schearzer and Jerusalem's (1995) work, other instruments were purposely developed for this study. A section on personal information (i.e. gender and years of experience in vice-principalship) and school information (i.e. school size, student academic ability, and school level) was also included.

4. Findings and Discussion

The reliability alphas for the four constructs were first checked and were found to be within satisfactory range (from .681 to .875). The ANOVA results showed that the three groups of VPs differed significantly on the constructs of self-efficacy ($F(2,207)=3.792$, $p=.024$) and colleagues' acceptance

($F(2,207)=4.434, p=.013$). The longer the VPs had been in the position, the higher degree of acceptance by colleagues and a greater level of efficacy they felt as shown in Fig. 1. The support of the principals and the availability of the feedback mechanisms did not found to be different significantly across the three groups.

Figure 1. VP's Self-efficacy, principal's support, colleagues' acceptance, and feedback mechanisms



Sequential regression analysis was used with the set of school and personal variables entered as the first block of independent variables and the set of school contextual factors (principal's support, colleagues' acceptance, and feedback mechanisms) as the second block. This was done with a view to factoring out the effect of the first block variables on the dependent variable.

The results of the regression analysis are shown in Table 2. When the first block of factors was considered alone, the following statistics: $R^2=.096$, $F=4.292$, $p<.05$ were obtained suggesting these factors were predictors of VPs' self-efficacy. The regression coefficients revealed that gender ($\beta=-.151$, $p<.05$) and school size ($\beta=-.178$, $p<.05$) related negatively to VPs' self-efficacy whereas VPs' years of experience in viceprincipalship ($\beta=.169$, $p<.05$) related positively. It was obvious that VPs would feel more competent as they had been on the position for a longer period of time. The two negative links were of interest to note. The low efficacious feeling reported by VPs working in larger schools in comparison to those working in small schools was understandable as they would probably have to deal with more parents and to deploy a larger task force. In addition, female VPs in HK did not see themselves as effectual as their male counterparts. The result suggested that the position of VP posed higher degree of challenges to female incumbents in the Chinese culture.

Table 2. Model summary of sequential regression predicting VPs' self-efficacy

Independent variables	R ²	F	p	ΔR ²	ΔP
Model 1:					
Block 1: School and personal variables	.096	4.292	.001		
Model 2:					
Block 1: School and personal variables	.244	8.016	.000	.148	.000
Block 2: School Contextual Factors (Principal's support, Colleagues' acceptance, and Feedback mechanisms)					
Standardised coefficients of sequential regression			Standardised β	P	
Block 1: School variables					
Students' academic ability			.079	.262	
School level (Secondary =1, Primary =0)			-.087	.214	
School size			-.178	.012 *	
Personal variables					
Gender (Female=1, Male=0)			-.151	.032 *	
Years of experience in vice-principalship			.169	.014 *	
Block 2: School contextual factors					
Colleagues' acceptance			.340	.000 *	
Feedback Mechanisms			.221	.020 *	
Principal's support			-1.69	.069	

*Denotes significance

The entry of the second block of variables again yielded a significant change in R2: $\Delta R^2=.148$, $F=8.016$, $p=.000$). The regression coefficients revealed that colleagues' acceptance ($\beta=.340$, $p<.05$) was the most significant predictor for VPs' self-efficacy, followed by feedback mechanisms ($\beta=.221$, $p<.05$) when the effect of personal and school factors had been controlled for. The effect of principal's support ($\beta=-.169$, $p>.05$) however was not found to be significant. The findings suggested that acceptance and endorsement of colleagues was the most critical factor affecting VP's perceived efficacy in Hong Kong schools in which relatively low job mobility was seen in teachers. As discussed earlier, the promotion of a teacher to AP often triggers an abrupt change in the prevailing hierarchical structure in a school. In the light of a high power-distance school culture as that exhibited in HK, VPs are promoted from positions collectively related to other teachers to positions socially remote from the rest of the school; they need to be psychologically prepared to adjust to the change and to be accepted by their colleagues. The results also showed that if VPs could be provided with timely and proper feedback on their performance, they would be less anxious in coping with their new position.

The analysis then went on to compare the effect of the three contextual factors on the level of efficacy perceived by VPs with different years of experience. Three sets of sequential regression analyses were run; one for each of the VP groups (less than 1 year, between 1 to 2 years and between 2 to 3 years); the non-significant predictors found in last sequential analysis were excluded from the analyses.

The regression results shown in Table 3 suggested that Feedback mechanisms only helped the newly appointed VPs ($\beta=.241$, $p<.05$) in adapting to their new role and its effect diminished as VPs accumulated more on-the-job experience. It is of particular interest to note the importance of colleagues' acceptance to the development of VPs' efficacy. It was found to be of more importance to newly appointed VPs ($\beta=.329$, $p<.05$) and to those who had been in the position for more than 2 years ($\beta=.507$, $p<.05$); its influence on VPs with 1 to 2 years experience was relatively small ($\beta=.275$, $p=.024$). The results suggested that newly appointed VPs would need the endorsement of their peer colleagues in helping them to psychologically prepared for the changing role; they might feel more competent in coping with the changes in the second year of office. However, when they move into their 3 years, they would probably start to realise importance of getting colleagues' support if they had to effectively deploy the frontline teachers and to maintain their motivation and commitment to accomplish school objectives.

Table 3. Regression results predicting VP's self-efficacy by Years of experience in vice-principalship

	Less than 1 year	Between 1 to 2 years	Between 2 to 3 years
Model summary	$R^2=.249$, $F=5.878$, $p=.000$	$R^2=.166$, $F=3.446$, $p=.013$	$R^2=.272$, $F=4.962$, $p=.002$
Standardised β			
Feedback mechanisms	.241 ($p=.040$)	.110 ($p=.351$)	-.169 ($p=.222$)
Colleagues' acceptance	.329 ($p=.004$)	.275 ($p=.024$)	.507 ($p=.000$)

5. Conclusion

This study attempts to understand the effect of school contextual factors on VPs' development of self-efficacy, based on a Hong Kong data set. The results suggested that female VPs and those VPs working in bigger schools felt less efficacious than their counterparts in adjusting to the new roles. The findings also revealed that colleagues' acceptance and school feedback mechanisms contributed significantly to the smooth transition of VPs when they first moved from the teaching role to the administrative role. However, the importance of feedback mechanisms appeared to fade out as they had been progressively settling in their new role in the later years. On the contrary, the importance of colleagues' acceptance intensified as VPs moved to their third year of office. In a cultural context in which harmonious working relationship is highly valued and staff mobility is relatively low, it is imperative for the policy-makers and practitioners to develop a fair and transparent succession plan with a view to improving the acceptability of the newly appointed VP in schools.

References

- Chen, G., & Klimoski, R.J. (2003). The Impact of Expectations on Newcomer Performance in Teams as Mediated by Work Characteristics, Social Exchanges, and Empowerment. *The Academy of Management Journal*, 46 (5), 591-607.
- Cranston, N., Tromans, C., & Reugebrink, M. (2004). Forgotten leaders: what do we know about the deputy principalship in secondary schools? *International Journal of Leadership in Education*, 7(3), 225-242.
- Crow, G. M. (2007). The professional and organizational socialization of New English Headteachers in school reform context. *Educational Management Administration & Leadership*, 35(1), 51-71.
- Hausman, C., Nebeker, A., & McCreary, J. (2002). The worklife of the assistant principal. *Journal of Educational Administration*, 40(2), 136-157.
- Kwan, P. (2009a). The vice-principal's dilemma – career advancement or harmonious working relationships. *International Journal of Educational Management*, 23(3), 203-216.
- Kwan, P. (2009b). The vice-principal experience as a preparation for the principalship. *Journal of Educational Administration*, 47(2), 191-205.
- Kwan, P. (2011). Development of school leaders in Hong Kong: Contextual changes and future challenges. *School Leadership and Management*, 31(2), 165-177.
- Kwan, P., & Walker, A. (2008). Vice-principalship in Hong Kong: aspirations, competencies and satisfaction. *School Effectiveness and School Improvement*, 19(1), 73-97.
- Lam, Y.L.J. (2003). Balancing stability and change: Implications for professional preparation and development of principals in Hong Kong. In P. Hallinger & W.O. Lee (Eds.) *Reshaping the landscape of school leadership development: A global perspective*, (pp.175-190). The Netherlands: Swets & Zeitlinger.
- Mertz, N. (2006). The organizational socialization of assistant principals. *Journal of School Leadership*, 16, 644-675.
- Schearzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston (Eds.). *Measures in health psychology: A user's portfolio. Causal and control beliefs* (pp. 35-37). Windsor, UK: Nfer-Nelson.
- Van Maanen, J., & Schein, E.H. (1979). Toward a theory of organizational socialization. In B.M. Staw & L.L. Cummings (Eds.) *Research in Organizational Behavior*, 1, 209–264.
- Westwood, R. (1997). Harmony and patriarchy: the cultural basis of paternalistic headship among the overseas Chinese. *Organization Studies*, 18(3), 445-480.
- Weindling, D. (1999). Stages of Headship. In T. Bush, L. Bell, R. Bolam, R. Glatter, & P. Ribbins (Eds.) *Educational Management: Redefining Theory, Policy and Practice*. London: Paul Chapman Publishing.

EDUCATION BY PRINCIPLES: WHAT EDUCATION? WHICH PRINCIPLES?

Marcus Vinicius Santos Kucharski, Ed. Ph.D.

Coordination of Technology in Education, Federal University of Technology - Paraná (Brazil)

Abstract

Since its re-democratization in 1989, Brazil has experienced numerous changes to its educational system: from school infrastructure to teacher training and career plans, from curricular modifications and student retaining programs to new assessment methods. In spite of it all, what we have harvested are shaming low results both in national (SANTANA, 2014) and international assessments (PISA, 2012), leaving us way behind other countries whose economies are similar or less complex than our own – fueling the emigration of many of our most brilliant minds to more developed centers. In looking back carefully, it is possible to grasp some repetitive mistakes that have consistently contributed to our state of things, mistakes we will present and discuss in this chapter, especially as we list the ten principles needed to fight them. Since early 2013, conversations have begun among various intellectuals in Southern Brazil toward the creation of an educational movement based on the belief that what education really needs is to set a certain number of principles over which to think and base all new developments that aim at a better, more effective educational formation of the citizen (and the professional, and the politically-conscious person). The shared views among its participants, which are currently been titled Education By Principles, are what the proposed oral presentation and chapter mean to disclose, establishing a wider ring of collaboration from trading experiences with as many colleagues are interested in similar propositions.

Keywords: *Educational issues, education by principles, educational policies, curriculum, teacher training.*

1. Introduction: a brief reality check

Brazilian investments in Education have grown consistently over the last 26 years, since its re-democratization. From the year 2000 until 2013, period in which data were more consistently documented, total investments in the area grew over 180% if we consider the amount invested per student (Brazil, 2013). In gross values, such investments grew from BRL 2,197.00 per student/year (US\$ 704.16 on April 7th, 2015) to BRL 6,203.00¹ per student/year (US\$ 1,988.14 on April 7th, 2015) (Brazil, 2013b). In the same period, the gap between what is invested in Kindergarten and Basic Education² students and in College/University students has been reduced from a 9.7 / 1 BRL to a 3.9 / 1 BRL (always in disadvantage of younger students).

All these numbers certainly show progress, one that has not been adequately mirrored by our students' results in international educational evaluations. Considering OECD's Programme for International Student Assessment - PISA, Brazilian results from 2000 to 2012 were as follows:

Table 1. Brazilian students' results on PISA 2000-2012. Adapted from MORENO, 2013.

Brazil's evolution at PISA (scores and relative positions among 65 participating nations)					
	PISA 2000	PISA 2003	PISA 2006	PISA 2009	PISA 2012
Math	334	356	370	386 (57 th)	391 (58th)
Reading	396	403	393	412 (53 rd)	410 (55th)
Science	375	390	390	405 (53 rd)	405 (59th)
General avg.	368	383	384	401	402 (58th)

Being the world's 7th strongest economy, the 58th place shames us as it makes us see the other six strongest economies figure so much higher in the charts. For example: **Russia**, the world's 6th strongest economy, is 25 positions above Brazil; the **USA**, 1st economy in the world, is 23 positions above us;

¹This value represents seven times the current Brazilian minimum wage.

²Basic Education, in Brazil, encompasses Elementary, Middle and High School levels.

China (2nd) places first (with Shanghai), 3rd with Hong Kong, 4th with Taipei and 6th with Macao; **Japan** (4th) places 7th; **Germany** (5th), places 16th; **France** (8th) places 25th (OECD, 2014). Should we consider the gross domestic product of all 57 nations placed before Brazil in the PISA rankings, our conclusions and self-esteem would be even more gloomy.

But it is not only in international exams that our students' performance has disappointed educators and families. Brazil's *Indicator of Basic Education Development* (IDEB), an assessment built from combining results of standardized tests and information about enrollment and evasion in public and private Basic Education schools all over the country, showed, in 2013, that grades dropped in 13 out of 27 states if we only consider public high schools – and only six states reached the expected goals for that year; when private schools are taken into account, the scenario worsens: only one state reached the expected results (Santana, 2014).

Since president Fernando Henrique Cardoso's nationwide implementation of the *Bolsa Escola*³, in 2001, many other affirmative programs with direct impact on education were created, amplifying basic schooling and child work eradication policies. It is indispensable to mention president Luis Inácio Lula da Silva's *Bolsa Família*, a wider cash transfer program created in 2003 that strongly includes – but is not restricted to – basic education policies.

At the same time, national educational policies have pointed towards more time in school (200 days a year), strategies to maintain youngsters in school (some of which highly debatable, such as the *basic cycles*, in which no one is retained [fails a year] before the 5th grade and, then, again, not before the 9th grade, no matter how poor their results are) and, more recently, to university admittance programs that separate 50% of the public universities' seats for those who have studied in public schools all their lives and/or are of African / Indigenous descent and score at least 50% of the highest grade reached by all participants of the *National High School Exam* (ENEM) – a rather debatable result, too, considering what the IDEB and the PISA results have showed about our students' performances. For many other students who do not meet the conditions to claim a seat in public colleges and universities via governmental affirmative programs, one that finances tuitions in private colleges and universities (called FIES) has also been created, aiming at augmenting significantly the number of people with college and university degrees.

What do we see in Brazilian schools, colleges and universities twenty-six years “down the road”? Worrisome test results – nationally and internationally; Middle School teachers complaining that the students they have received from Elementary Schools can barely read or solve basic mathematical calculations – the same complaint is heard among High School teachers about Middle School students and, not unpredictably (but nonetheless shocking), among College and University professors about their freshmen; 17,8% of the adult population is functionally illiterate (Lisboa, 2014); the academic performance of college and university students who *did not* benefit from the government's affirmative actions described in the previous paragraph is, in average, 9% to 10% higher than that of beneficiary ones – and the advantage soars to 73% in Physics and 43% in Computer Science in a study that encompassed 10 graduation courses and allowed the comparison between beneficiary and non-beneficiary students in public universities (Fraga, 2013).

2. Finding culprits

Culprits a-plenty were nominated in the various studies made all over the years. As we understand it, each one did have its fair share of guilt in the whole process, but the overall tendency of such studies was pointing out one or two factors as if they could explain all the troubles isolated from the context, from some macro-situations that, as we understand it, play major roles in our current scenarios.

It has always been easy to affirm that underprepared and underpaid teachers and professors could not ensure much better results than what we have experienced. Increasing salaries – even if just a little – and promoting continuous training course after continuous training course were devised as solutions. What end up shadowed, here, are at least two thought-worthy facts: 1) the underprepared teachers and professors usually come from very similar (if not the same) formative institutions, and both have been approved in usually demanding selective processes (at least those who teach in public institutions); 2) learning results from the works of better prepared teachers and professors still outweigh those of the less prepared ones, even in low-paying institutions.

Accusing the less technologically-equipped public schools of promoting unattractive learning environments and, thus, producing poorer results has also been a trend. The problem has been tentatively solved by investing in computer laboratories which are hardly ever used to their full educational potential by many different reasons – maybe the most important one being that educators themselves are still

³A monthly family allowance program that was conditioned to enrolling and maintaining children in schools, away from any possibility of child work.

negatively bewildered by all that could be pedagogically accomplished with those machines, feeling that they probably would not be able to keep up with the flood of potentially untreated information. That only enforces Larry Cuban's (2001) view that, in educational institutions, computers are oversold and underused – and let us keep in mind that Cuban said that 14 years ago and his thought is still fresh.

Another common culprit has been the curriculum, though, in this specific sense, the educational “artillery” has not focused a common target: both more and less extensive, globally and locally-oriented, socially and individually-driven, politically-determined and “neutrally”-focused, academically or citizen-formation-oriented curricula have been equally condemned by paradoxical discourses in terms that they could never bring effective changes, long-lasting ones. In 2015, the current official discourse is one of reform for High Schools in order to make curricula “more flexible, attentive to local specificities, less demanding(!)” etc. In other words: History has taught us nearly nothing; our vision of the curricular problems remains just as blurred and unspecific as it has always been.

These examples do account for the most common reasons for the unsuccessful educational experience of our students, teachers, professors and administrators – and we could never propose to cover all other reasons in five pages. Though we are not denying any of them their share of merit, we are not convinced that any of them – neither all of them – can break new grounds for lasting, positive changes in our educational systems and in the quality of our students' learning. An embryonic movement within some academic environments has been making itself visible, though slowly, in the past few years. This movement believes that effective transforming educational policies, ones that can make us hope for strong, sustainable betterments in our teaching and learning methodologies and results, must rest on a set of inalienable, inseparable principles that should be taken into consideration as a whole. We present, in the next section, what we now consider to be these principles.

3. Principles for change

The multiple academic movements in which the next principles have been nurtured and addressed – not all together, but rarely with less than three or four of them – have not, as of yet, been formally united, but in Southern Brazil, by efforts of independent-thinking professors, a catalytic group, which we deliberately call “Education by Principles”, is taking form. The ten principles the group values as the most relevant for positive and viable transformations in Brazilian education are listed and very briefly discussed in an *a priori* order of relevance that can be modified at any time.

1) *Effective professionalization of teachers and professors.* In Brazil, just about anyone can be a teacher or a professor. The lack of professional organizations and stronger legislations that clearly define who can be a teacher/professor and, more than that, not being able to point out and effectively reject those whose technical and/or pedagogical competencies are less than sufficient to be professionally certified, have contributed to bringing us to a dead-end alley. A common agreement over technical and pedagogical competencies necessary to make one a teacher/professor and to speak on his/her behalf when their work is assessed by a trustworthy association of educators (including a specific association for that, different from our weak teacher unions) is strongly necessary.

2) *A curricular review towards effective, critical learning.* Brazil's struggle with curriculum has been one between “more content vs. less time” and “even more content vs. even more time”. Lately, we are leaning against a “less content vs. even more time”, as we saw in the last section. Our opinion is that a thorough review of the curriculum is necessary, but its focus should be bringing life back into school. All worthy knowledge comes from real-life problems and affects real-life decision-making – except, maybe, for most of which is presented and evaluated in our schools nowadays. School is a fundamental stage of preparing one for viable adult life, making him/her ready for essential decisions. In this sense, building a curriculum based on meaningful, grounded knowledge that can evolve to deeper discussions of its implications (yielding critical thinking) is the way to go (Moreira, 2006). It is a matter of qualitative, not quantitative reviews. Teacher training and professionalization are a must to reach the necessary maturity for such negotiation.

3) *Embracing information and communication technologies adequately.* Equipping our schools with powerful(?) machines and speedy(?) internet connections is not enough. That would be the same as spending a lot to power a Volkswagen Beetle with a Porsche engine. These ICTs, especially those that make up Web 2.0, are truly important for the development of meaningful and critical learning. But all that technology without an essential modification of the traditional pedagogy of knowledge-transmission will turn all these investments into ineffective expenses. Once again, teacher training and professionalization are strongly linked to another one of the group's principles.

4) *Excluding politically-biased discourse from school contents.* In twenty-five years under military rule, most of the opposing political thought flourished mainly under left-wing discourse. What we see now in Brazilian schools, after the recent curricular reform that introduced Philosophy and

Sociology as mandatory courses for High Schools is a highly-biased, Leninist-Bolivarian-socialist discourse with all its easily predictable consequences in forming our young minds under an unopposed point of view. The imminent threat here is constantly approximating Brazil of certain Latin-American, Caribbean, African and Asian (semi-)dictatorships instead of maturing democratic principles that govern many countries whose social indicators we should be pursuing (e.g. Finland, Sweden, Canada, Austria, Switzerland, Norway, Germany, South Korea...).

5) *Rendering the family-school-government tripod equally accountable for the effectiveness of the educational process.* The dominant social discourse in Brazil is one to burden schools with total accountability for the unsuccessful process of educating. It is not common understanding that families have an essential role in making students value education and educators for what they represent in the process of reaching lifelong goals. Families usually see schools as “magical storehouses” for their children while parents work all day; magical in the sense that they will host children from a very early age and take up all responsibility of turning them into responsible, critical-thinking, respecting citizens without any necessary support from families. A deeply distorted social discourse makes it almost acceptable that teachers be physically-assaulted by some of their students, who are nearly always backed-up by their families in any disagreement. At the same time, the government is far from providing policies and funding that would guarantee a safe and healthy study-work environment for both students and teachers.

6) *Abandoning the idea that Education and schooling are the answers to all local and national problems.* Schooling and educational programs can only go so far towards solving broad social problems. Educators are not almighty gods; Medicine, Law, Government and all social institutions have recognizable limits concerning solving deep-rooted, multifaceted problems. Nonetheless, it is the prevalent discourse that schools are the one and only hope for social change and improvement; the same underfunded, underequipped, undermanned, overcrowded and overburdened schools we have been discussing all through this essay.

7) *Drawing an attractive and organized career for educators.* As a consequence of what we discussed in principle #1, teaching is a rather low-paying job in Brazil. Lira (2014) pointed out that the average monthly pay of a Basic Education teacher was BRL 1,874.50 (US\$ 598.88 on April 7th, 2015); at the same time, an entry-level adjunct professor at a Federal University made approximately BRL 8,400.00 (US\$ 2,683.70 on April 7th, 2015). An enormous difference in Brazilian terms, but yet, in the best scenario, the Brazilian adjunct professor – always a Ph.D. – made approximately US\$ 2,800.00 less than teachers in the low-end of the payment grade in American High Schools a year (Program Evaluation, 2014); if we compare high school teachers directly, the yearly disadvantage of the Brazilian professional soars to US\$ 27,813.40. Add this to the working conditions and teacher training programs (or lack thereof) we have been discussing and you will easily see why expectations of having vastly trained and motivated professionals are not high.

8) *Bringing to schools equal opportunities of development to all kinds of human talents.* Ken Robinson (2006), in his TED Talks presentation (Monterey, California), advocated the importance of equally developing all possible human talents in school as a differential towards a renewed educational system. Yet, Brazilian public school system still is 100% academic-focused, content-driven and an excluder of any other manifestation of competences – especially sportive and artistic ones.

9) *Promoting responsible inclusion.* Special-needs students, especially the mentally-disabled, the blind and the deaf have historically been looked after by well-structured non-governmental organizations. All their expertise and infrastructure have been viciously attacked in the past thirteen years by an irresponsible government discourse of radical inclusion. The government even planned and tried to eliminate special schools (considered a financial burden on the State) – unsuccessfully until now. The strategy is to radically include all such students in regular schools, despite all the problems it would eventually cause. Sixty hours of sign language training have been made mandatory for all teacher-forming courses, like it would be minimally sufficient. The right to a sign language translator in every classroom with a deaf student was made a law, even when we do not have nearly enough certified professionals for that. Unanswered questions: what about the blind? The psychologically-disturbed? The mentally-challenged? The psychotic? Inclusion is just as good as the necessary conditions provided for it to happen.

10) *Turning educational management into a career.* Teachers are not necessarily (very rarely, we can say) prepared to manage educational programs and institutions. Nonetheless, they are frequently those over which such responsibilities fall. Managing an educational program or institution demands fine-tuned administrative skills that can only be developed through lengthy and thorough formation. It should still be done by certified teachers, but it should also become a specific career path.

4. Final thoughts

We believe these ten principles carefully suit the needs for a radical transformation for the better that Brazilian education needs so badly. They are not affiliated to any specific political standpoint, but certainly tend to more democratic practices and outcomes. They basically aim at forming an autonomous citizen, conscious of his/her responsibilities towards the conventions that make community life possible and desirable.

These flexible principles essentially bear the belief that an effective school experience is only built when we ally the *savoir être* (enjoyment of being – critical autonomy) to the *savoir faire* (enjoyment of doing – skills and competences) without ever underestimating the *savoir* in itself, the pleasure of knowledge for knowledge's sake, which we obtain by guaranteeing each student with the opportunities of being exposed to and develop the most varied types of knowledge and experiences without the need to hierarchize them as more or less important ones.

The ideal these principles disclose is one that Paulo Freire would name a “feasible utopia”, like all utopias should be, according to his belief. Let us hope that the seeds find good soil.

References⁴

- *Brazil. (2013). Anísio Teixeira National Institute of Educational Studies and Research - INEP. *Variation of direct public investment in education, by educational level*. Retrieved April 7th, 2015, from <http://portal.inep.gov.br/web/guest/indicadores-financeiros-educacionais/variacao-do-investimento-publico-direto-em-educacao-por-nivel-de-ensino>.
- *Brazil. (2013b). Anísio Teixeira National Institute of Educational Studies and Research - INEP. *Direct public investment in education per student in gross values, by educational level*. Retrieved April 7th, 2015, from <http://portal.inep.gov.br/web/guest/indicadores-financeiros-educacionais/investimento-publico-direto-em-educacao-por-estudante-em-valores-reais-por-nivel-de-ensino>.
- Cuban, L. (2001). *Oversold and underused: computers in the classroom*. Cambridge (USA): Harvard University Press.
- *Fraga, E. (2013). *Beneficiary students have lower performance among university students*. (April 28th, 2013). Retrieved April 8th, 2015, from <http://www1.folha.uol.com.br/educacao/2013/04/1269984-cotistas-tem-desempenho-inferior-entre-universitarios.shtml>.
- *Lira, D. (2014). *In Brazil, teachers' salary is about half of what other professionals receive*. (June 11th, 2014). Retrieved April 29th, 2015, from <http://ultimosegundo.ig.com.br/educacao/2014-06-11/no-brasil-salario-de-professor-e-metade-do-que-recebem-outros-profissionais.html>.
- *Lisboa, V. (2014). *Illiteracy drops in the country, but still reaches 13 million people*. (September 18th, 2014). Retrieved April 8th, 2015, from <http://agenciabrasil.ebc.com.br/educacao/noticia/2014-09/Analfabetismo-cai-0,4-pontos-percentuais-mas-ainda-atinge-13-milhoes>.
- *Moreira, M.A. (2006). Meaningful, subversive learning. In: *Série-Estudos. Periódico do Mestrado em Educação da UCDB*. Campo Grande (MS). n.21. p.15-32. JAN/JUN 2006.
- *Moreno, A.C. (2013) *Brazil evolves, but still figures in the last positions of the educational rankings*. (December 3rd, 2013). Retrieved April 7th, 2015, from <http://g1.globo.com/educacao/noticia/2013/12/brasil-evolui-mas-segue-nas-ultimas-posicoes-em-ranking-de-educacao.html>.
- OECD. (2014). *PISA 2012 results in focus: what 15-year-olds know and what they can do with what they know*. Paris: OECD.
- Program Evaluation. (2014). *What's the average high school teacher salary in the US?* (January 11th, 2014). Retrieved April 29th, 2015, from <http://www.programevaluation.org/education/teacher-salary/high-school-teacher-salary/>.
- Robinson, K. (2006). Do schools kill creativity? In: *TED Talks Portuguese channel on YouTube*. (Posted by Marcond Marchi on October 31st, 2011). Retrieved on April 29th, 2015, from <https://www.youtube.com/watch?v=aQym7WkF5ks>.
- *Santana, A.E. (2014). *IDEB: Middle School Results worsen in 13 states: check the results*. (September, 5th, 2014). Retrieved April 8th, 2015, from <http://www.ebc.com.br/educacao/2014/09/apenas-anos-iniciais-do-ensino-fundamental-tem-bom-desempenho-no-ideb>.

⁴ All references preceded by an asterisk (*) have their original titles and texts in Portuguese; the titles were translated into English for better understanding.

SCHOOL AUTONOMY: 21ST CENTURY DEVELOPMENTS

José da Costa¹, Paul Newton², Frank Peters¹ & Lorne Parker¹

¹Department of Educational Policy Studies, University of Alberta (Canada)

²Department of Educational Administration, University of Saskatchewan (Canada)

Abstract

The concept of highly autonomous decision-making (HADM) is known by a variety of names in Alberta, including: site-based management, site-based decision-making, site-based budgeting. These variants have the following in common, minimally: a significant proportion of budget is transferred to the school level, decisions regarding how to use this budget allocation to meet the needs of learners are made at the school level. From a leadership perspective, highly autonomous school administrative systems rely on facilitative approaches to decision-making, which engage a variety of stakeholders.

Conceptually, decision-making in education systems can be classified as based in competing beliefs tending towards, what Garms (1978) described as: equity, efficiency, and liberty. HADM tends to emphasize efficiency and liberty. Anecdotal evidence suggests that HADM approaches are most effective, with respect to student learning, where learners, or their parents, exercise choice.

Adapting philosophical beliefs and practices from business, Edmonton Public Schools (EPS), in 1977, moved seven schools to control over 80% of their individual budget expenditures (including funding for professional and support staff, supplies, equipment, and professional and support services). While implementation was not without issues, the project was so successful that all schools were moved to HADM in 1978. At the Board level, EPS also opened attendance boundaries to allow students to move to schools offering programming that best met their learning needs. Over the following decade many schools developed programs of choice through which to teach Alberta curriculum. These programs attracted students from anywhere in the school jurisdiction boundaries.

This paper focuses on HADM developments in Alberta since 2000; several observations emerge:

1. HADM in sparsely populated areas is not driven by efficiency or choice.
2. While decisions are devolved to the local level, the Provincial government maintains tight control over curriculum and accountability measures; Alberta Education requires testing of students annually and releases results to the public to facilitate choice.
3. In relation to observation #2, a mass exodus from low performing schools has not occurred.
4. Implementation of HADM requires authentic control over budget, personnel, and curriculum at the school level; Alberta school jurisdictions represent a full range of implementation from those in which these decisions are made at the school level to those that give very little decision-making power to the school level.
5. Even when decision-making is devolved to schools, the people having the best combination of vision, expertise and “stake” in the outcomes do not always make decisions.

Keywords: *School decision making, Leadership, School Autonomy, School choice, School change*

1. Introduction

In this short paper, we report on the policy and practice contexts for school autonomy and 21st Century learning in Canadian provinces. We focus on the province of Alberta, which appears to have the most developed policy context for school autonomy. Where appropriate, we speak to the wider Canadian context; however, we limit much of the discussion to the province of Alberta, since a more complete discussion of the Canadian context would take more space than we have available in this short paper.

1.1. The Canadian Context

Reporting on the context of Canadian education is no easy matter as education is a provincial responsibility in Canada. There exists great variability in requirements, certification, curricula, educational policy, legislation and teacher training. Each of the 11 jurisdictions (10 provinces and 3

territories – the latter of which are under federal jurisdiction) have their own curriculum or program of studies. There have been some limited attempts in the past to coordinate curricula (e.g. Western and Northern Canadian Protocol (e.g. 2006, 2008), Atlantic protocol (e.g., 1999)); however, these have met with limited success and each jurisdiction maintains its own distinct education system. Federal funds generated from income taxes are transferred to provinces for Education, Health, and other areas of provincial concern; however, provinces have autonomy (with very few exceptions – e.g. official languages education) with respect to resource allocation, governance, and curriculum.

1.2. Background

Highly autonomous decision-making (HADM) is known by a variety of names in Alberta, including: site-based decision-making, site-based budgeting, performance management. All of these variants have the following in common, at minimum: (a) a significant proportion of budget is transferred as a block to the school level, and (b) decisions regarding how to use this budget allocation to meet the needs of learners are made at the school level. From a leadership perspective, HADM relies on facilitative approaches (i.e., formal leaders are not directive, rather they work, to a great extent, in collaboration with school stakeholders) to decision-making, which engage a variety of stakeholders. In Saskatchewan, HADM, as a policy has not been aggressively pursued. In fact, we were not able to locate any provincial policy that identified SMB or school-level autonomy. In contrast, the discourse on school division level autonomy was well established in the province until the compulsory school division mergers that occurred in 2007.

Conceptually, decision-making in education systems can be classified as based in competing beliefs tending towards, what Garms, Guthrie, and Pierce (1978) described as: equity, efficiency, and liberty (i.e., choice). HADM tends to emphasize efficiency and liberty. Anecdotal evidence suggests that HADM approaches are most effective, with respect to student learning, where learners, or their parents, can exercise choice.

2. Multi-Levelled Autonomy: The Case of School Boards

Although each province has its own unique system of education, in Canada, education governance is shared among the provincial authorities and school boards, divisions, or districts (these administrative units are referred to by a variety of names – school divisions in Alberta and Saskatchewan, school boards in Ontario, and sometimes school districts as in British Columbia). In general, the purpose of school boards is to provide for local autonomy over education in each province. In this sense, autonomy is a complicated and multi-leveled phenomena with a measure of autonomy devolved from the state to local school jurisdictions, and yet other elements of autonomy devolved to the school. School boards, districts, or divisions are legal and corporate entities that are separate in many ways from the provincial government. The relationship among governments, school jurisdictions and schools (not to mention teacher unions) is complex. However, school jurisdictions operate independently of the state. In addition, most school divisions have an historical right to self-establishment. That is, tax payers in certain geographic areas can establish school divisions, establish and collect education taxes, and set geographic boundaries for the school division, board or district. In recent years, some provincial governments (e.g., Saskatchewan) have limited the autonomy of school divisions to self determine their geographic boundaries and administrative structures (e.g., Saskatchewan Learning, 2004). To a certain extent this can also be seen in the provinces of Alberta and British Columbia through the provincially forced amalgamation of many smaller school boards or divisions into larger, more administratively efficient ones.

The state's involvement tends to be characterized by the transfer of financial resources for operations and facilities and for curricula and related educational policies. Other elements of school operations are shared between school jurisdictions and schools – for example, in most provinces, staff are hired, fired, and compensated by school divisions. Agreements between unions and employers are either negotiated at the level of school jurisdiction (although provincial collective bargaining exists in some provinces). Schools typically have autonomy over elements of educational decision making that pertain only to the local school and community. In some cases, (e.g., Edmonton, Alberta) more autonomy is granted to the school by the school jurisdiction with respect to human resources and school finance. This type of multi-leveled autonomy is not adequately captured by, for example, the TALIS (Vieluf, 2012) definitions of school autonomy.

3. Context for HADM

Adapting philosophical beliefs and practices from business and industry, then Superintendent of Edmonton Public Schools (EPS), Michael Strembitsky initiated a pilot project in 1977 in which seven schools were given decision-making control over 80% of their budget expenditures. This was up from approximately 2% and included funding for all professional and support staff, supplies, equipment, and professional and support services. The shift to HADM required re-organizing of Central Office functions to provide vision and support rather than direct school operations. While implementation was not without issues, the project was so successful that all schools were moved to HADM in 1978.

At the Board level, the EPS also opened attendance boundaries to allow students to move to schools offering programming that best met their learning needs. Over the following 10 to 15 years many schools developed programs of choice through which to teach Alberta curriculum. These programs served to attract and enroll students from anywhere in the school jurisdiction boundaries.

Expansion of HADM (or iterations of HADM known by other names) occurred in the Province of Alberta in the early 1990s. Supporting HADM approaches the Province adopted policy that favoured open attendance boundaries both across schools within jurisdictions and across jurisdictions (i.e., a student, or his or her parents or guardians, could choose to attend a school outside of their usual geographic school attendance boundaries). Provincially, schools and programs of choice were encouraged in a system that saw student funding grants flow to the jurisdiction in which the student was enrolled. Generally, jurisdictions then also allowed funding, through locally developed funding formulas, to flow to the attendance school for each student.

Hand-in-glove with the attendance boundary changes at the Provincial level, Charter School legislation was passed in the early 1990s allowing for non-profit societies to create and run schools on the basis of unique charters (i.e., a program or approach of choice). The Province further encouraged freedom of choice by increasing public funding amounts to private schools in which the approved Alberta program of studies curriculum was taught.¹ To encourage decision-making at the local school level, the Province required the establishment of School Councils that would include parents, community members, and, at the high school level, students. While these councils were initially conceived as having decision-making powers, their role was quickly changed to “advisory” due to push-back from educators in general and the Alberta Teachers’ Association (ATA) specifically, of which principals are all members.

3.1. Benefits of HADM

When properly implemented, many leaders believe that HADM results in increased student learning as well as increased job satisfaction for teachers, school-based leaders, and support staff. Other benefits include increased and meaningful participation and engagement of parents and local business community members in the vision and direction of their school. Leaders who embrace participative decision-making with staff and school councils find that decision about how to best make use of education funding are supported by their constituents. Many emphasize that keeping the local context and local needs in mind in the decision-making process is key.

In large urban centres, programs of choice, which are locally developed and supported, attract students both from the local catchment area and, often, well beyond. This serves to increase student enrolment, further boosting funding received by the school. Leaders, staff, and school council members, if they are “in tune” to the needs of the local community, are best able to interpret local data to make informed and highly contextualized decisions to support school-based initiatives (e.g., decision to increase upper elementary class sizes in order to shift resources to hiring additional lower elementary teachers to provide the youngest learners with a more intensive, teacher supported learning experience). Supporters of HADM point to Alberta’s high student rankings in international measures of student achievement (e.g., PISA, TIMMS) as evidence of the success.

¹Note that powers over education rest with the Provinces and Territories of Canada and not with the Federal government of Canada. Alberta has always had two fully publicly funded types of jurisdictions: Public and Separate. The existence of these was originally enshrined in the British North America Act of 1867, which allowed either minority Protestant or Catholic communities to create a publicly funded school system. These rights were transferred to territories already having this system in place but joined Confederation later, as Alberta did in 1905.

Also important to understand is that First Nations schools and school systems are funded by the Canadian federal, not the Albertan provincial, government under different agreements and legislation; these are neither considered Alberta publically funded school jurisdictions nor private schools.

3.2. Drawbacks of HADM

Educators have pointed out important drawbacks of HADM, although many critics of these perspectives would argue that the criticisms are actually grounded in philosophical beliefs that are simply inconsistent with HADM; critics of these drawbacks may simply argue that these issues arise because of poor implementation of HADM.

Principals will often talk about the increased competition for attracting students to their own schools from other neighbouring schools. This, these principals argue, takes away from their time as instructional leaders, forcing them to spend more time on public relations and recruitment.

The ability of students or their parents to exercise choice (i.e., take their education funding to another school that better meets their needs) is curtailed for many families. Students whose families are unable to pay for or to provide transportation from their homes to their school of choice are unable to attend schools outside of their local community. Rural students also have very limited choices since, due to sparse population density, there may only be one school from which to select. Also, children, whose parents do not immediately value the benefits of education, are very unlikely to exercise choice or to participate in and contribute to school council discussions. Yet other critics of HADM, as supported through parental choice, point out that the ability to attend schools of choice leads to homogeneity of social classes in particular schools. Those with a preponderance of middle and upper-middle class students tend to perform better on various standardized measures (e.g., Provincial Achievement Tests, PISA, TIMSS) while those schools left with larger numbers of children from educationally impoverished families perform more poorly on these same measures – the emphasis is too much on choice and efficiency at the expense of equity.

Finally, some leaders have pointed out that in small schools there are losses of economy of scale. Interestingly, in Edmonton Public Schools over the past 15 years a group of approximately 10 (this number has varied slightly over the years) city centre schools have come together to share resources and capitalize on increased economy of scale with purchasing from vendors. Supporters of HADM would simply point out that if this synergy best meets the needs of students in these schools, then HADM is working successfully in those sites.

4. Observations

Several observations about HADM emerge:

1. HADM in sparsely populated areas (e.g., rural, northern) is not driven by efficiency or choice (i.e., there is, typically, only one choice).
2. While decisions are devolved to the local level, the Provincial government maintains very tight control over curriculum and accountability measures. Alberta Education requires all school jurisdictions to have children in grades 3, 6, and 9 complete Provincial Achievement tests (math and English language arts in grade 3, and math, English language arts, science, and social studies in grades 6 and 9) and Diploma exams (in all academic subjects) at the end of grade 12; these results are released to the public annually for accountability purposes, many would argue that these measures are necessary for the members of the public to identify and select the best schools for their children.
3. Interestingly, in relation to observation #2, a mass exodus from low performing schools has not been evident; when reductions in school enrolment have been noticeable, these have typically been the result of reduced numbers of children living in mature neighbourhoods (i.e., children of families in the school neighbourhood have grown up).
4. Implementation of HADM requires authentic control over budget, personnel, and curriculum be devolved to the school level; Alberta school jurisdictions represent a full range of implementation from those in which these decisions are made at the school level, guided by district and Provincial visions, to those that give very little decision-making power to the school level.
5. Even when decision-making is devolved to schools, the people having the best combination of vision, expertise and “stake” in the outcomes do not always make decisions.
6. From a “choice” perspective, Inspiring Education, as a vision for student-centred learning, is only as effective as Government’s ability to convince parents that this is the best approach for their children’s learning.

5. Emerging Issues

Many of the new developments in educational policy in Alberta have been highly politicized. In particular, discovery learning, discovery math is under fire in the public media. Also, recently, The Task

Force on Teacher Excellence has come under fire. In particular, the recommendations for teacher evaluation and re-certification, the reclassification of principals as “out-of-scope”, and the lack of collaboration in the process has drawn intense criticism from the teaching force and from the teachers’ union (The Alberta Teachers’ Association, 2013). The following recent headlines give the flavor of the public debate concerning 21st Century learning policies in Alberta:

- The Alberta Teachers’ Association has approved a vote of non-confidence (May 18) in the Education minister.
- Students ‘cheated’ by way math is taught, say educators and parents.
- New education system designed to free students will enslave teachers.
- Alberta Education must stop ‘self-destructive’ reforms, experts say.

References

- Alberta Education (N.D.). Curriculum Redesign. Retrieved November 3, 2014 from <http://education.alberta.ca/departement/ipr/curriculum/about.aspx>
- Alberta Education (2010). Inspiring Education. The Steering Committee Report To The Honourable Dave Hancock, Minister Of Education Government Of Alberta. Retrieved November 3, 2014 from: <http://education.alberta.ca/media/7145083/inspiring%20education%20steering%20committee%20report.pdf>
- Alberta Education (2013). Learning And Technology Policy Framework. Retrieved November 3, 2014 from: <http://education.alberta.ca/media/7792655/learning-and-technology-policy-framework-web.pdf>
- Alberta Education (2009). Principal Quality Practice Guideline. Retrieved November 3, 2014 from <http://education.alberta.ca/media/949129/principal-quality-practice-guideline-english-12feb09.pdf>
- Alberta Education (2014). Task Force For Teaching Excellence. Retrieved November 3, 2014 from: https://inspiring.education.alberta.ca/wp-content/themes/inspiringeducation/_documents/goae_taskforceforteachingexcellence_web_updated.pdf
- Alberta Education (2013). The Education Act. Queen’s Printer, Edmonton. Retrieved November 3, 2014 from: <http://www.qp.alberta.ca/documents/acts/e00p3.pdf>
- Alberta Teachers’ Association (2013). Minister Announces Task Force For Teaching Excellence. Edmonton, Ab. Retrieved November 3, 2014 from <http://www.teachers.ab.ca/news%20room/news%20releases/2013/pages/task-force-for-teacher-excellence.aspx>
- Atlantic Provinces Education Foundation (1999). Foundation for the Atlantic Canada Social Studies Curriculum. Halifax, Ns; Atlantic Provinces Education Foundation.
- Canadians For 21st Century Learning And Innovation. (2012). Comparison of Selected Existing 21st Century Learning Frameworks. Retrieved November 3, 2014 from: <http://www.c21canada.org/c21-research/>
- Garms, W.I., Guthrie, J.W., & Pierce, L.C. (1978). School finance: The economics and politics of public education. Englewood Cliffs, NJ: Prentice Hall.
- Saskatchewan Learning (2004). Education Equity Initiative. Retrieved On January 29, 2008 from http://www.sasked.gov.sk.ca/branches/comm/minister/speeches/ed_quity.shtml
- Vieluf S., Et Al. (2012). Teaching Practices and Pedagogical Innovation: Evidence from Talis, OECD Publishing. Retrieved November 3, 2014 from http://www.oecd-ilibrary.org/education/teaching-practices-and-pedagogical-innovations_9789264123540-en
- Western and Northern Canadian Protocol. (2006). The Common Curriculum Framework For K-9 Mathematics. Western and Northern Canadian Protocol. Retrieved November 3, 2014 From <http://education.alberta.ca/media/645594/kto-9math.pdf>
- Western and Northern Canadian Protocol. (2008). The Common Curriculum Framework For 10-12 Mathematics. Western and Northern Canadian Protocol. Retrieved November 3, 2014 from <http://www.wncp.ca/media/39327/10to12frame.pdf>

PERCEIVED PRACTICES AND INFLUENCE OF EDUCATIONAL LEADERS ON ACADEMIC SUCCESS IN K-12 ADULT SCHOOLS

Gustavo Lara-González

School of Arts and Sciences, Brandman University (U.S.A.)

Abstract

The study explores and describes how the role of educational leaders in K-12 adult schools is perceived by educational leaders, teachers, administrative staff, and adult students, and whether this role influences the academic success of adult students. A multiple case, qualitative research design was used to explore the perceptions of 30 participants about the influential role of educational leaders in the academic success of adult learners. Semi-structured field interviews were used to collect data from three educational leaders, nine teachers, nine administrative support staff, and nine adult students in three K-12 adult schools in Southern California. The researcher determined the veracity of the transcribed interviews and then returned some of them to their respective participants to validate their authenticity and accuracy. Twenty themes emerged through the thematic data analysis method and were corroborated by an outside consultant. Findings revealed that not only does intrinsic motivation propel adult learners to succeed academically, but also educational leaders have an essential role in educating adult students. For teachers and administrative support staff, the results indicated social interactions should be governed by respect and trust. Finally, findings showed that educational leaders perceived their role as architects of a culture of learning in which the academic success of adult learners is the result of effective teaching practices. This research will contribute to expanding the understanding that the role of education leaders in K-12 adult school is not restricted to overseeing the functioning of schools, but they are an essential component in motivating teachers and administrative staff to serve and support adult learners in reaching their educational goals

Keywords: *Educational Leadership, K-12 Adult Education, Adult Learners*

1. Introduction

The dynamics of today's marketplace is creating a perpetually evolving economy. This new economy is demanding a workforce with tools, not only intellectual, such as critical thinking and problem solving skills, but technical skills to compete successfully where competition is tough. This economic competitiveness is requiring a workforce equipped with the right skills and tools of transformation and adaptability to the new economic, political, cultural, technological, and demographic shifts. More than ever, the role educational leaders is crucial, not only to oversee the well-functioning of schools but to form a new workforce with the necessary skills to compete and succeed in this new economy and live a productive and satisfying life.

2. Theoretical Framework

The theoretical foundation for this study is based on the belief that leadership is a social interaction, a distributive model of leadership, which is primarily concerned with leadership practice, and how leaders influence the organization and its instructional improvement (Spillane, 2006), was included in the theoretical framework. Additionally, the CPSEL, produced by the California School Leadership Academy at WestEd, Association of California School Administrators, with its six standards, provided the indicators of leadership actions to meet the educational needs of students. These, combined with five themes – vision, culture, resources and innovation, collaboration, and ethics – that emerged from the review of literature, served as the theoretical framework from which the data were reviewed.

3. Research Questions

RQ1: What are the adult students' perceptions of the role of educational leader?

RQ2: What are teachers' perceptions of the role of educational leader?

RQ3: What are administrative staff's perceptions of the role of educational leader?

RQ4: What are educational leaders' perceptions of their role?

4. Participants

The target population for this study was the 28 K-12 adult schools in two counties in Southern California. The accessible population consisted of three K-12 adult schools, identified in this study as School B, School C, and School F. A mixed sampling method was used purposefully and conveniently to select K-12 adult schools and participants of the study, from which data was collected. The sample consisted of 30 participants from three adult schools, divided into four groups, depending on their roles in the school sites: educational leaders, teachers, administrative support staff, and adult learners. Of the participants in each school, 10% were educational leaders, 30% were teachers, 30% were administrative support staff, and 30% were adult learners.

5. Methodology

A qualitative descriptive multiple case research design was applied to gather and analyze the data for this study. This methodology was selected because this type of design provides effective methods for collecting information without changing the environment. Qualitative research is an effective tool for attempting to understand how individuals perceive and interact with their environment (Creswell, 2003; Merriam, 2002; Yin, 2003). Merriam (1998) further stated that multiple case studies are suitable methodology for dealing with critical problems of practice and various aspects of education. Additionally, multiple case method (a) favors the collection of data in the natural setting, and consequently fosters a close collaboration between the researcher and participants; (b) it is suitable when the research addresses descriptive or exploratory questions; and (c) the evidence collected from this type of study is considered robust and reliable.

6. Data Collection

To adequately explore the influential role of educational leaders in the academic success of adult learners, the researcher used in-depth interviews (see Appendices D, E, and F) with a semi-structured format as the primary source for collecting data from each participant. Merriam and Brockett (2009) affirmed that most interviews in qualitative research are semi-structured, and that the questions should focus on the study. Furthermore, DeMarrais (2004) defined an interview as "a process in which a researcher and participant engage in a conversation focused on questions related to a research study" (p. 55). The interview (referred to as a field interview) for each of the consenting participants was conducted at the convenience of the participants and in a conversational tone, as DeMarrais suggested, with a purpose of recording and documenting responses to probe for deeper meaning and understanding.

Educational leaders selected their offices to maintain privacy and confidentiality. For teachers, the interviews took place in their classrooms before or after class session. For the administrative support staff and adult students at each school, educational leaders designated the conference room as the location for the interviews, to protect the privacy and safeguard the confidentiality of participants. At the beginning of each interview, a formal introduction took place, and then the researcher explained the study and stated the purpose of the study. Next, the researcher obtained the participants' permission to record the interview. All the field interviews were audio recorded and transcribed. Before the codification process began, based on the accuracy of the first transcribed interviews, the researcher decided to give a copy of the transcribed interviews to 20 participants, which is approximately 67% of the entire sample.

Written field notes were taken after each interview to maintain the freshness of the interview conversations. These reflective notes were written for two purposes: (a) to record thoughts, ideas, questions, or concerns, and (b) to reflect on themes that emerged during the interviews.

7. Data Analysis

Thematic data analysis methodology was used as the instrument to analyze the narrative data generated by the field interviews. The analysis was based on an inductive approach to proficiently identify patterns in the collected data by a technique of thematic codes. Braun and Clarke (2006) defined this methodology as a "method for identifying, analyzing, and reporting patterns" (p. 79). They proposed six steps of the thematic data analysis:

1. Become familiar with data collected.

2. Generate initial codes.
3. Search for themes.
4. Review themes.
5. Define and name themes.
6. Produce the report.

The initial step in analyzing collected data for this study was an exploratory analysis. This exploratory analysis consisted of carefully listening to the audio-recording interviews and reading and re-reading the interview transcripts. During this initial step, the researcher became immersed in it and became familiar with the collected data. During this stage, important quotes or phrases were highlighted, which marked the initial cycle of generating codes. Saldaña (2013) stated that during this first cycle, coding processes can range in magnitude from a single word to a full paragraph to an entire page of text.

The codification process came next. At this step, it was determined that in order to interpret the meaning of the collected data, connecting was more important than labeling. Charmaz (2001) described this stage as the critical link between data collection and the explanation of meaning. This interpretative activity allowed the researcher to compile and organize all the coded data into categories or themes. The goal of coding, explained Strauss (1987), is to organize and arrange the collected data into useful categories or themes to support the theoretical concept of the study. The objective was to identify potential themes or categories relevant to research questions 1 to 4, as reflected in the data from the interviews and relevant to the theoretical framework of this study.

The next step was combining all the potential themes to have a comprehensive view of the information and identify emerging patterns. Bernard (2011) referred to this analytical process as “the search for patterns in data and for ideas that help to explain why those patterns are there in the first place” (p. 338). Finally, once the themes were selected and their congruency verified to the orientation of this research, the themes were validated by reference back to the literature review, transcribed interviews, and field notes. Then, a few of the selected themes were renamed and redefined.

8. Summary of Findings

8.1. Summary of Adult Learners’ Perceptions

For the participants of the adult learners group, the findings revealed that internal motivation is the driving force that propels adult learners to persist in their educational programs. The role of educational leaders is perceived as important but secondary. This perception confirms what Leithwood, Harris, and Strauss (2010) found in a six-year study in which they concluded that educational leadership is second only to classroom instruction as an influence on student learning.

Furthermore, the findings of this study indicated that the role of educational leaders is essential in four out of the five themes and subthemes. Educational leaders are crucial in managing the fiscal and human resources in order to build a productive and supportive learning environment in which adult learners feel safe physically, emotionally, and socially. As perceived by adult learners, educational leaders have to not only be effective and efficient administrators and creators and protectors of a positive environment that nurtures learning and fosters collaboration among teachers, but also leaders who display a genuine interest in the adult learners’ education.

8.2. Summary of Teachers’ Perceptions

The findings indicated that the teachers value respectful and trustful professional relationships. From the interviews with participants of this group, it was found that professional relationships among the members of the school community should be governed by respect and trust. These two elements are the glue that nourishes democratic communities where members can do extraordinary things. At the heart of collaboration is respect and trust, affirmed Kouzes and Posner (2002). There is considerable evidence, based on the findings of this study, that the perceived ramifications of respectful relationships are open communication and a sense of collaboration. For the participants of this group, an educational leader has to be the creator of a collaborative environment in which the contribution of every member of the school community is valued. They understand that collaborative environments open the channels of effective communication, and coordinate the effort of every member of the school to help adult learners accomplish their educational goals.

Finally, participants of this group saw micromanagement behavior of educational leaders as an obstacle to effective communication, creativity, trust, and cooperation, consequently affecting student learning and persistence. They perceived that the role of educational leaders is to create an environment that is conducive to teaching and learning by fostering a culture of trust and mutual respect and ensuring that all members of the school community are functioning in a safe and supportive environment.

8.3. Summary of Administrative Support Staff's Perceptions

The analysis of data concluded that administrative support staff recognizes educational leaders as architects of a collaborative community that fosters student learning. This collaborative culture builds and sustains effective teaching and exceptional service, and creates a safe and fertile environment in which adult learners will succeed.

The role of educational leaders, according to the perceptions of the members of group, is vital for the creation of collegial relationships that foster collaboration. At the heart of collaboration lies a respectful relationship. For the participants of this group, mutual respect and trust are the prime ingredients that should govern these collegial relationships, because if they trust each other they can produce outstanding results. Kouzes and Pozner (2007) concur with the perception of participants by stating: "We will work harder and more effectively for people we like. And we will like them in direct proportion to how they make us feel" (p. 57).

Open and honest communication is another theme that emerged during the analysis of the collected data. Participants of this group believe that the purpose of communication should be to inform, inspire, and reflect constructively on the mission and vision of the school, which is to serve the educational needs of the local community. The analysis of the collected data suggests that educational leaders are decisive in creating and encouraging trusting relationships built on mutual dialogue and respect. CPSEL Standard 2 (2004) (see Appendix A) indicated that educational leaders promote the success of students by advocating and promoting equity, fairness, and respect among all members of the school community.

8.4. Summary of Educational Leader's Perceptions

The analysis of data suggested that educational leaders see themselves as architects and guardians of a hospitable culture of learning, where the academic success of adult learners is the result of effective teaching practices and outstanding service. By making learning a top priority, educational leaders are the suppliers of the instructional tools and the creators of respectful school environment in which teachers and administrative support staff work collaboratively to ensure that all adult learners are receiving quality instruction and superior service.

The last themes that emerged from the thematic data analysis were respect and mutual trust. Educational leaders did not place respect and trust at the same rank as teachers and administrative support staff did. For teachers and administrative support staff, respect and mutual trust were essential components in promoting participation, collaboration, and innovation. For educational leaders, being the creators of the hospitable climate that promotes good teaching and learning, and modeling professional integrity were more important. However, by modeling work ethics and professional integrity, educational leaders are promoting respect, trust, justice, and fairness among school members.

9. Implication for Practices

The findings from the study suggest the following implication for practice:

1. The study confirmed what other research studies have been proclaiming – that motivation and learning are inseparables (Zull, 2002). The findings of this study indicate that the force that propels adult learners to reach their educational goals is the desire and disposition they have to overcome any obstacle. Therefore, adult schools should be not only the center in which adult learners acquire the skills and tools that integrate them to the workforce but a center that offers the instruments to overcome a sense of failure, hopelessness, anxiety, fear, insecurity, and discrimination. By overcoming these obstacles, the integration into the workforce will be permanent, and their participation as productive members of this society will be enduring.
2. The study showed that the sense of physical and emotional security is an important factor that influences the academic success of adult learners. Therefore, educational leaders have to be the builders and guardians of the environment in which adult learners feel physically and intellectually safe, which in turn foster a sense of belonging. The sense of safety and ownership are the main components of persistence.
3. The role of educational leaders is becoming more complex. They are not only responsible for the operation of schools; during the day, they wear different hats. They have to communicate a clear vision of where the school is going. They also have to support teachers with the help and resources they need to be effective in the classrooms. It is their responsibility to create a school culture in which teachers and administrative support staff work collaboratively to ensure that all adult learners reach their educational goals. However, the study revealed one more role that educational leaders have to play: they have to show a genuine interest in the academic success of adult learners. Therefore, they have to enlarge their visibility in order to connect with adult learners and everyone in the school community. They have to enhance their accessibility by genuinely interacting more with adult learners. Accessibility and visibility nourish connectivity.

When educational leaders connect with teachers, administrative support staff, and adult learners, they become an instrument of motivation and inspiration.

4. For educational leaders, respect was the last theme that emerged during the analysis of data. For teachers and administrative support staff, respect was the first theme that emerged. This disconnectedness is an impediment for good teaching, and consequently, for good learning. When faculty and administrative support staff sense that they are valued, trusted, and respected, they take these emotions to their workplace. When these emotions are floating and become permanent in the climate of the school, adult learners sense them, and this becomes an invitation to return the following day and continue with their educational journey. Therefore, mutual trust and respect should be the lubricant governing every action of educational leaders. These two elements are small things that pave the way for great things.

10. Conclusions

There is no doubt that post-secondary education is a key driver of social mobility. The more educated the workforce is, the less economic insecurity, poverty, and unemployment they experience. The purpose of adult education is to offer adult learners the opportunity to obtain the knowledge and skills to integrate into the workforce permanently, becoming self-sufficient, and participating actively in the community. Therefore, the role of educational leaders in K-12 adult schools is not restricted to overseeing the well functioning of the complex mechanism of educating adult students, but also to shape individuals with the necessary skills to actively participate in their respective communities.

Adult schools, as one of the educational leaders explained to the researcher, are the soul of their communities. In this context, educational leaders at K-12 adult schools are one of the main components in molding communities. They fulfill this social responsibility by establishing and cultivating a school environment that nurtures students' learning, and supports the professional growth of teachers and administrative support staff.

Educational leaders play an essential role in the equation of adult learning. They are responsible for cultivating a climate of hospitable learning that safeguards the physical, emotional, and intellectual integrity of everyone. They are the external force that influences adult learners to persist in their academic programs.

References

- Bernard, R. H. (2011). *Research methods in anthropology: Qualitative and quantitative approaches* (5th ed.). Walnut Creek, CA: Altamira Press.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101.
- Charmaz, K. (2001). Grounded theory. In R. M. Emerson (Ed.). *Contemporary field research: Perspectives and formulations* (2nd ed.) (pp.335-352). Prospect Heights, IL: Waveland Press.
- Creswell, J. W. (2003). *Research design: Quantitative, qualitative, and mixed methods approaches*. Thousand Oaks, CA: Sage.
- DeMarrais, K. (2004). *Qualitative interview studies: Learning through experience*. Mahwah, NJ: Lawrence Erlbaum.
- Kouzes, J. M., & Posner, B. Z. (2007). *The leadership challenge* (4th ed.). San Francisco, CA: Jossey-Bass.
- Kouzes, J. M. & Posner, B. Z. (2002). *The leadership challenge*. San Francisco, CA: John Wiley.
- Leithwood, K., Harris, A., & Strauss, T. (2010). *Leadership for turning schools around*. San Francisco, CA: Jossey-Bass.
- Merriam, S. (1998). *Qualitative research and case study applications in education*. San Francisco, CA: Jossey-Bass.
- Merriam, S. B. (2002). *Qualitative research in practice: Examples for discussion and analysis*. San Francisco, CA: Jossey-Bass.
- Merriam, S. B., & Brockett, R. G. (2009). *The profession and practice of adult education*. San Francisco, CA: Jossey-Bass.
- Saldaña, J. (2013). *The coding manual for qualitative researchers*. Thousand Oaks, CA: Sage Publications Inc.
- Spillane, J. P. (2006). *Distributed leadership*. San Francisco: Jossey-Bass.
- Strauss, A. L. (1987). *Qualitative analysis for social scientist*. New York, NY: Cambridge University Press.
- Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Zull, J. E. (2002). *The art of changing the brain: Enriching the practice of teaching by exploring the biology of leaning and practice*. Sterling, VA: Stylus.

Poster Presentations



IMMIGRANT TEACHERS: PROFESSIONAL INDUCTION CHALLENGES AND STRATEGIES

Claire Duchesne, Nathalie Gagnon & France Gravelle

Faculty of Education, University of Ottawa (Canada)

Abstract

While Canada is a welcoming place for many new arrivals, the latter nevertheless run up against roadblocks when it comes to having their foreign academic credentials and professional experience recognized by Canadian employers and professional orders (Deters, 2006). As a result, many of them are forced to switch career paths. Several of these immigrants turn toward teaching, subsequently enrolling in faculties and departments of education at Canadian universities to earn the credentials they need to practice this profession (Collin & Camarais, 2013; Duchesne, 2008). The French-language school boards in Ontario, specifically in the Ottawa and Toronto areas, welcome these new teachers once they have completed their training. However, their professional integration into these schools is fraught with challenges related to their own socio-professional backgrounds as well as their personal beliefs about teaching and learning (Cho, 2010; McIntyre, 2011; Myles, Cheng & Wang, 2006). This is the case with the participants in our research study, who in fact experienced many challenges related to fitting in at their new schools.

A total of 12 new immigrant teachers agreed to participate in a semi-structured research interview. Participants hailed from Sub-Saharan Africa (6), North Africa (4) and Europe (2). At the time of the interview, participant ages were between 28 and 57 ($M = 41$ years). Aside from one participant who had been a substitute teacher for 12 years before receiving her first position, candidates had an average of 2 years' experience teaching in Ontario and 10 held regular positions. In addition, these new teachers had been living in Canada for an average of 8 years and had spent 2 to 14 years looking for a regular job after immigrating. Seven participants were teaching in primary schools and 5 were teaching in secondary schools for the same French-language school board in Ontario. Interviews were recorded in digital audio format and fully transcribed for analysis in the software program, NVivo. Provisional codes were established based on interview question themes; then, coding and categorizing procedures were carried out. The three researchers performed triangulation via parallel blind coding.

The poster presentation address the difficulties encountered by these new teachers, as well as two categories of strategies they employed to ease their transition to teaching, such as: *Attitude-based Strategies* (such as making an effort to understand their surroundings, affirming one's identity or developing a new one, and demonstrating self-confidence) and *Action Strategies* (such as adopting practices of other teachers at school, talking with and observing Canadian colleagues, making themselves better understood by their colleagues, making sure they were respected for who they are, and showing interest in discovering the Canadian culture).

Professional integration in itself is a complex step in the lives of teachers. When immigration-related obstacles are added to the mix, it is clear that the challenge of integrating newcomers involves specific issues that should be considered by the education authorities.

Keywords: *Immigrant teachers, professional induction, challenges and strategies.*

References

- Cho, C. (2010). "Qualifying" as teacher: Immigrant teacher candidates' counter-stories. *Canadian Journal of Educational Administration and Policy*, 100, 1-22.
- Collin, S. & Camarais, L. (2013). Les futurs enseignants issus de l'immigration récente : un modèle de diversité culturelle? *Québec français*, 168, 50-51.
- Deters, P. (2006). *Immigrant teachers in Canada : learning the language and culture of a new professional community*. Proceedings of the European Association of Languages for Specific Purposes / Asociación Europea de Lenguas para Fines Específicos (AELFE). Zaragoza, Spain.

- Duchesne, C. (2008). Difficultés d'insertion professionnelle en enseignement : le rôle des conceptions d'étudiants étrangers inscrits dans un programme de formation des maîtres. *Formation et pratiques d'enseignement en questions*, 8, p. 119-139.
- Myles, J., Chang, L. et Wang, H. (2006). Teaching in elementary school: Perceptions of foreign-trained teacher candidates on their teaching practicum. *Teaching and Teacher Education* 22, 233-245.

THE AESTHETICS OF EVERYDAY LIFE IN PRIMARY SCHOOL AND THE IMPLICATIONS OF AESTHETIC EDUCATION

Ya-Ting Lee

Department of Education, National Pingtung University (Taiwan, Republic of China)

Abstract

The aim of this study¹ is to explore the aesthetic qualities of everyday life in an elementary school in Taiwan. In order to complete the purposes, the multi-methods are conducted, including interview, observation, and document analysis. The conclusions are offered to construct the practice of aesthetic education curriculum in Taiwan.

Keywords: *Aesthetics of everyday life, aesthetic education, aesthetic quality*

1. Introduction

The current trend in the world is towards to lay great stress on the power of aesthetic. To cultivate the moral, cognitive, physical, social, and aesthetic development of the citizens has always been the aim of Taiwan. For the implementation of the National 12-year Basic Education System, the Ministry of Education of Taiwan put more emphasis on the aesthetic literacy through promoting the "the first five-year plan of aesthetic education" since the year of 2014 to 2018. This project was regarded the aesthetic sensibilities as a kind of living habits and built the recognition of self-value, which seemed to reflect the aesthetic concepts in everyday life. Contemporary Western concerned for the aesthetics of everyday life gradually increased (Light & Smith, 2005; Saito, 2007). The aesthetics of everyday life is expected to offer the different foundation for the aesthetic education in Taiwan.

2. Objectives

1. To investigate the history as well as the category of the aesthetics of everyday life.
2. To analyze aesthetic characteristics and the hidden curriculum of campus space in an elementary school.

3. Research Design

The seven aesthetic factors of everyday life are proposed by this study through literature review. Observation and interview are used to reach the goal of this study. An elementary school in Taiwan is selected to be observed its campus space and design of built architecture. The researcher analyzes the aesthetic characteristics according to the seven aesthetic factors and understands the implication of aesthetic characteristics and the hidden curriculum via interview.

4. Major Results and Conclusions

The aesthetics of everyday life primarily originate from discontent with the concept of "disinterestedness" in Kant's aesthetics. Aesthetic objects shift away from art world to the aesthetic characters of everyday life. This study generalizes seven aesthetics factors to environment and these seven factors are regarded as the aesthetic evaluation for the environmental campus buildings as well as the hidden curriculum in the case school. This study indicates that these seven factors appear that belong to four kinds of human necessities respectively, which are cognitive (the beauty of understanding, the beauty of legend), ethical (the beauty of life, the beauty of sustainability), aesthetical (the beauty of

¹This project was funded by Ministry of Science and Technology of R.O.C

perception, the beauty of imagination), and practical (the beauty of experience) to reflect the integration of “truth”, “goodness”, “beauty” and “action”. Moreover, these “truth”, “goodness”, “beauty” and “action” are interacted to form three core ways which are “incorporate truth into an aesthetic experience”, “moral deliberation supported by aesthetic experience” and “educate aesthetic literacy through action”.

4.1. The aesthetic qualities of everyday life in the Wan-Wan elementary school

This study was to analyze and explore the beauty of campus environments and their hidden curriculum of the Wan-Wan elementary school with the seven aesthetic factors of environment. The current school location of Wan-Wan elementary school was a large pond before, but now becomes a filled land. The geographical location of Wan-Wan elementary school in that county is similar to a tail of phoenix-shape. Wan-Wan elementary school sets out from the historical and geographical features of school to integrate into the characteristic curriculum and campus renaissance. The school also incorporate the cultivation of aesthetic literacy to everyday life in school to be the hidden curriculum.

4.2. The integration of the beauty of perception, the beauty of understanding and the beauty of legend

The meaning of the word “water” in the Wan-Wan elementary is not only the knowledge of physics but also the educational philosophy of the campus environment. Principal Yi taking “The supreme good is like water” in Dao De Jing for educational philosophy and moral educational belief of school. This philosophical beliefs are engraved on two stones which are named “SHANG- SHAN- BEI” and “RUO- SHUEI- TANG” near the small pond in campus to symbolize the historical marking of past geographical features of the Wan-Wan elementary school. The cloud-shape of carved stone of RUO- SHUEI- TANG is white marble sculpture. Its form “gas” is one of the states of water. Principal Yi constructed the campus in the contrasting color. Many white marble sculptures locates on green lands in campus. The contrast of white and green provokes the attraction of visual sensation. Another school historical background of geographical location originated from the location is similar to the tail of phoenix-shape. Thus, in atrium of campus or on the green land near playground lies red brick chars in phoenix or frog style. The simple beauty of a red brick against the background of green beauty assists campus release fun but the gentle and calm atmosphere . Whether water marble sculptures or phoenix-shape red brick is not only the visual decoration of campus but is the relaxing lounges for students, parents or people in campus. To integrate the concept of “water” and the history of geographical name of the school in county annuals, the school designs these relaxing seats in both the beauty of perception and the beauty of understanding and shows the functional beauty of serving people.

4.3. Converting the beauty of legend into functional beauty

Moreover, the cylindrical architectural carving stands on the left side of the door and colorful flying phoenix guiding the blue and red dolls symbolizing the students in Wan-Wan elementary school step towards the bright sun and the moon. The long tails of phoenixes turn into blue waves and the fish swim in, which connects the two cultures of “BADE-POND” and “FONG-YI” in Wan-Wan elementary school. The toilet is located within this wall carved cylindrical building. The wall carving stands for the culture of the Wan-Wan elementary school and it also transform the unpleased feeling which the function of building itself may bring. The yard in the Wan-Wan elementary school is human’s life space and the design of the pond makes various creatures coexist within campus space. Principal Yi also mentioned that the change of whole campus space design motivates the participations of the school community. Parents make the campus environment become more beautiful by bringing colored carp to the pond and they are also willing to maintain the environment of campus together. This phenomenon reflects what Saito (2007a) said, if people find positive taste in aesthetic judgment and emotional attachment between the nature and artifact, they tend to have responsible and respect attitude towards actions. This seems to be consistent with what this study said “moral deliberation supported by an aesthetic experience”.

4.4. The representation of the beauty of life and the beauty of sustainability

Trees are usually used the most in the campus landscape design. After the typhoon raged in the summer vacation, some parts of the trees fall and are broken. These are the materials used in the campus landscape design. The principal makes a literate trail integrating language arts by utilizing existing woods in the school. The literate trail decorated with the broken woods is both used for the recognition of the poetry and telling children that it is the regeneration of the value of lives. “The woods are wastes if burned, while they are valuable if recycled.” the principal says. The use of the local resources to regenerate the campus landscape is closely linked to the representation of the beauty of life and the beauty of sustainability.

4.5. Feeling the beauty of perception and the beauty of experience

The curriculum belief of the Wan-Wan elementary school is rooted in “students as a visagiste of the school.” After visiting the campus, it is found that there are many spaces for students’ intellectual and physical demonstration, such as the exhibition of multi-culture clothes in the building of the English Village. The representation of students’ works seen everywhere in the campus decorates colorfully on each wall, catching people’s eyes.

4.6. An Ideo-Multi-Sensory Campus

Sepänmaa (2007) proposes an aesthetic appreciation of cities in the concept of “ideo-multi-sensoriness.” After visiting the Wan-Wan elementary school many times, the researcher found that the principal Yi transformed the philosophical and educational thinking into concrete campus spaces which may be the functional models of the concrete objects, sensory and perceptual colors and shapes, products that reflect the culture of the campus made by parents, teachers and students, and recycling works that are based on sustainability and the respect of lives. The researcher wanders around the campus, experiences the several aesthetic factors in campus, including the beauty of perception, the beauty of imagination, and so on. I read the symbolization of stories, and carefully examines the space for exhibition for students’ activities and learning that is free and different from traditional. From various campus construction and interior design in the Wan-Wan elementary school, through the variable such as building configuration, the school architectural space was named after the characters of the campus location or educational vision to make the whole campus space be full of aesthetic symbols and create local cultures as well as the cognition and experience in aesthetic perception hidden curriculum.

References

- Light, A., & Smith, J. M. (2005). *The aesthetics of everyday life*. New York, NY: Columbia University Press.
- Saito, Y. (2007). *Everyday aesthetics*. New York, NY: Oxford University Press.
- Sepänmaa, Y. (2007). Multi-sensoriness and the city. In A. Berleant & A. Carlson (Eds.), *The aesthetic of human environments*(pp.92-99). Ontario, Canada: Broadview.

CINEMA, BIOLOGY AND EDUCATION IN SECONDARY SCHOOL: CONSTRUCTION OF A LIFELONG LEARNING

Marcia R. Pereira¹ & Ana Beatriz F. Ribeiro²

¹Departamento de Biologia e Ciências, Colégio Pedro II e DCN, CAPUERJ, UERJ/Professora Assistente (Brasil)

²Departamento de História, Colégio Pedro II (Brasil)

Abstract

Formal education unfolds as a process of information acquisition, which is expected, is inserted into a mental framework, thus allowing the student to make use of their knowledge in a dynamic way, being able to transfer, infer and deduce, based on information gained by constructing analogies and fruitful synthesis between different fields of knowledge (Gould, 2004).

The acquisition of such capacity demand beyond the work of writing, reading and guided reflection in the classroom, the use of different languages, as in the case of the entertainment cinema, in a proposal to build knowledge in biology approaching aspects of non-formal education, incorporating some of its advantages (Smith, 2008).

The use of films allows exercise the acquisition of information, the ability to infer, to transfer and to build analogies between daily events and school knowledge.

This work, performed by high school Colégio de Aplicação da UERJ students, is part of building a continuous learning, an analytical look and the ability to incorporate new structures of thought, with the realization of novel syntheses. Sixteen different films were analyzed by groups of students belonging to a set of four classes. Films were used such as: Apollo XIII, Frankenstein, Life is Beautiful, among others.

At Life is Beautiful emerged issues such as the concept of sexual selection and the use of science for political purposes.

In a complex world, where the volume of knowledge is constantly growing, developing these capabilities, which allow learning to learn, in a process for life, it is something essential.

Keywords: *Biological education, longlife education, teaching and learning process*

1. Introduction

Formal education takes place as a process of information acquisition, which we expect, is inserted into a mental framework, thus allowing the student to make use of their knowledge in a dynamic way, being able to transfer, infer and deduce based on existing information, building analogies and fruitful synthesis between different fields of knowledge, throughout his life (Gould, 2004).

The acquisition of such capacity demand to be able to learn how to learn, in a process for life, since, according to Pinto (2005, p.2), "as an expanded process the various contexts of one's life." According to UNESCO (1998, p. 166), about education throughout life, this "... leads directly to the concept of educational society, a society in which they are offered multiple opportunities to learn at school and in economic, social and cultural life."

Therefore, the construction of knowledge, especially in school, through the written work, reading and reflection, considered mathematical knowledge and skills, carried out in the classroom, with an increasing realization that the use of different languages and educational strategies contributes to promote learning. This, seen here as the ability to retain and be able to apply such knowledge in a variety of contexts, and may internalize this knowledge by joining the "non-formal to formal knowledge, the development of innate skills to acquire new skills." according to UNESCO (1998, p.107).

The question that guides the present proposal is how to encourage students seek to exercise their knowledge in and out of school and how to be able to, from that knowledge, interpret aspects of life facing the biological knowledge, to read a newspaper or making a doctor's appointment, and how the school improves knowledge to learning to learn.

The use of entertainment films places a possibility of meeting between the formal educational space and the non-formal, in a proposal to build knowledge in Biology, without forgetting the possibility, in the analysis the film, to make analogies between different areas of knowledge and applying knowledge of these various areas for making the final work.

The condition of a not fully structured task proposal highlights the qualities association between these two forms of learning, formal and non-formal, and the contributions that both brings to the individual, in a process that aims set up an intimate relationship with knowledge, by voluntary exposure to activity.

The idea to create opportunities to develop an affinity relationship with the learning that goes beyond the obligations of acquiring a formal body of knowledge and can apply it, besides being urged to pursue their further development, is in line with the proposed learning to learn, fundamental to learning for life.

According to Smith (2008, p.1):

The point of education should not be to inculcate a body of knowledge, but to develop capabilities: the basic ones of literacy and numeracy as well as the capability to act responsibly towards others, to take initiative and to work creatively and collaboratively. The most important capability and the one which traditional education is worst at creating is the ability and yearning to carry on learning. Too much schooling kills off a desire to learn.

2. Methods

This work, performed by of the 2nd year high school students of Colégio de Aplicação da UERJ is part of building a continuous learning, an analytical look and the ability to incorporate new structures of thought, with the realization of novel syntheses, starting exposure to new situations.

The non-binding proposal and work in groups called for students to choose from a set of sixteen entertainment films, one with which wanted to work and whose only task was the search for in the movies a maximum of situations that could be associated and explained with the aid of their knowledge, identifying biological, among others, including metalinguistic aspects. The assigned note corresponded to the statement of up to 1.0 extra point (Figure 1).

In this project, the lack of defined expectations and the use of entertainment films commercially released are intended to enable the creative building relationships between different subject fields and real learning for knowledge mobilization in uncertainty.

Figure 1. No mandatory homework

UNIVERSIDADE DO ESTADO DO RIO DE JANEIRO
CENTRO DE EDUCAÇÃO E INICIACIÃO
INSTITUTO DE APLICAÇÃO VESPASIANO RODRIGUES DA SILVA (CAIAP)

TRABALHO EM GRUPO

Nome: _____ Nº: _____
Data: ____/____/2014 1º Ano: EM Turma: _____

A BIOLOGIA É A SÉTIMA ARTE (1.0 ponto)

Este trabalho visa construir um ator-produtor com a realização de novas situações, a partir da exposição a novas situações.

Com o uso do cinema, o grupo (4 a 5 componentes) deverá estabelecer analogias entre fatos e situações artísticas e/ou formais e instruções intelectuais e científicas (método, paradigma, uso político do cinema, etc.) e a biologia (conceitos, fatos e teorias como se relaciona à evolução, seleção sexual, fisiologia humana, cognição, genética, hereditariedade, variação, ontogênese, etc.).

O trabalho deverá ser feito com a escolha de um filme por grupo, SEM REPETIÇÃO, a partir da lista de um dos seguintes filmes:

A apresentação consistirá de uma folha digitada com o roteiro em tamanho 10, escrita entre linhas de 10, e 100% de impressão, preferencialmente colorida, do uso do filme, com montagem de um painel onde, através de imagens, relações e diálogos de cinema, poderão ser usadas as composições de imagens.

FILME	FILME
Apollo XIII	A Vida é Bela
Despertar de uma Paixão	Poderoso Afrodite
X-men 2	Todos Dizem Eu Te Amo
Gattaca	O Estranho Mundo de Jack
Clube de compras Dallas	Mãos talentosas - The Benjamin Carson Story
O Dia de Lançoso	Frankstein
Uma Chance Para Viver (com Henry Cavill Jr)	Tempo de Despertar
Quase Deuses (com Alan Rickman e Mos Def)	A Primeira Viagem (com Val Kilmer)

3. Results

The use of films allowed both reflexive exercise as acquisition of information, and the ability to infer, to transfer and to build analogies between facts and daily and/or formal and instructional situations.

Among the results, we highlight the analysis of the Apollo XIII film, in which the group of students reported the following, among others: the physiology of gas exchange in humans, when the ship,

despite having oxygen gas available for systemic breath, was suffering an increase in the amount of carbon dioxide that could take astronauts to death and the most subtle way that addressed the issue of the cold war and the role of the US space program in this context.

In the film *Life is Beautiful* issues have been identified as the concept of sexual selection on the likelihood of increased survival of offspring, where the main character is chosen as the husband by the female protagonist although its original suitor was stronger and beautiful, but less kind and intelligent, and misuse of science for political purposes, present in the Nazi concentration camps.

In *The Nightmare Before Christmas*, becomes relevant the perception of the use of the scientific method at the Jack's Christmas analysis and in *Dallas Buyers Club*, the drug discovery issues and trade thereof, highlighting issues related to organizations responsible for approval of medicinal products and pharmaceutical industries.

In the film *The Painted Veil*, the mechanism of epidemics perception such as cholera and social and cultural issues that permeate the encounter between western Europe medicine and the inhabitants of a Chinese village in the early twentieth century.

Figure 2. Image presenting some works



4. Discussion and Conclusion

The observation of enthusiasm and mobilization of students and the results of the studies presented brought the realization of acquisition of meaning that students have internalized and the connections that can be established between the school and the outside world for them.

This process highlights the ability to make analogies that result from and the ability to reflect on the knowledge and incorporate critically and constantly new data that enable the production of new syntheses.

One of the classes that participated in this work, made a proposal for the last assessment period, based in performing connection between fields studied such as human anatomy and physiology throughout the year with the episodes of medical drama series *House*. The work in question is being carried out in groups and the episodes / themes are of free choice by the students.

In a complex world, always changing, where the volume of knowledge and information is constantly growing, it is essential to develop these capabilities, intellectual and affective, that allow learning to learn, in a process for life.

References

- Gould, S. (2004). *O Polegar do Panda: reflexões sobre a história natural*. São Paulo: Martins Fontes.
- Pinto, Luis Castanheira. Sobre educação não-formal. *Cadernos Inducar* (2005). Disponível em: <http://www.inducar.pt/webpage/contents/pt/cad/sobreEducacaoNF.pdf> Acesso em 02/07/2014.
- Smith, Mark K. Informal learning, *The encyclopaedia of informal education*. Disponível em; <http://infed.org/mobi/informal-learning-theory-practice-and-experience/> (1999/2008). Acesso em 01/07/2014.
- UNESCO. (1998). *Educação: Um tesouro a descobrir - Relatório para a UNESCO da Comissão Internacional sobre Educação para o Século XXI*. São Paulo: Editora Cortez.

ENGINEER-TEACHERS IN THE CHANGING ATTRACTION OF THE TEACHING CAREER

Anetta Bacsa-Bán

Institute of Teacher Training, College of Dunaújváros, Dunaújváros (Hungary)

Abstract

In the past years, the survey of the teaching career has got in the limelight, equally in the respect of choosing the career and abandoning the career or the satisfaction on the career. Surveys have put such groups into focus which have a low degree of satisfaction and therefore a high degree of career abandoning. These surveys have called the attention on the fields of engineer-teachers, vocational instructors and trade teachers, on the basis of the above mentioned points.

In my present survey, I would like to reveal the components and characteristics of staying on career and career abandoning of engineer-teachers graduated from the College of Dunaújváros, on the basis of the data of the last 5 years. The subjects of the survey were all students graduated from the shared teacher training scheme, and I would like to verify the duality of their career orientation on the basis of earlier research results

The central issue of my survey was to reveal the factors which make the engineer-teacher training and career are attractive.

The results of the research met the preliminary expectations, which means that the engineer-teacher training according to the new-type "Bologna System" strengthens the staying on the career; those who choose this training scheme stay or, in some cases, get on the teaching career due to the constraint of the degree.

Keywords: *Teaching career, engineer-teacher training, empiric survey*

1. Antecedents

In the past years, the survey of the teaching career has got in the limelight, equally in the respect of choosing the career (Varga, 2007), and abandoning the career (Mihály, 2010), or the satisfaction on the career (Chrappán, 2010). Surveys (Chrappán, 2012; Veroszta, 2012) have put such groups into focus which have a low degree of satisfaction and therefore a high degree of career abandoning.

The choice of the teaching career is a multifactor situation with several actors, with the following main stages: choice of the teacher training scheme; employment within the teaching career after graduation; and finally the decision of staying on career.

Nevertheless, this process can take a totally different turn when it is the case of the Bologna system shared vocational teacher training, since these training schemes are being carried out in the form of correspondence training in nearly all training places. Varga (Varga, 2007) points out the following factors, which increase the tendency of leaving the career: if the teacher's degree is a BA and not an MA, and the inquired person is male, leaving of the teaching career becomes more characteristic. And those graduates who got their degrees in technical, information technology, law and economic fields are also in a lower proportion in teaching positions. But, all in all, those can be found in teaching positions who have a lesser difference between the salary that they can get as teachers and that one they can get as non-teachers (Varga, 2007.). This becomes a very important point for those who graduate in vocational teacher training!

A great number of surveys regarding the abandoning of the teaching career have proved that the first 5 years following the graduation and employment are critical from the point of career leaving. In the respect of career abandoning, the age, the type of institution and the age of the taught students differentiate, but a deviation can also be shown between the general and the vocational training institutions. In the vocational training institutions, we can find quite a great number of career abandoning teachers (Mihály, 2010).

One of the main factors of staying in the career is the career satisfaction (*Chrappán, 2010*). The teachers' salaries in the vocational training still fall much behind the incomes that can be received in an employment of similar size in the competition sphere (*Chrappán, 2010*). And, from all these, the authors of the above mentioned studies (*Varga, 2007; Mihály, 2010; Chrappán, 2010; Chrappán, 2012*) draw the conclusion that the teacher, vocational instructor and engineer-teacher degrees are still the most marketable in the labour market.

And here we can examine the career abandoning also in another dimension: can the vocational instructor and engineer-teacher working in the vocational training, but not employed as a teacher or vocational instructor, as well as the engineer-teacher working as an engineer in the competition sphere be qualified as a career leaver? Veroszta has pointed out that although they leave the teaching career, their knowledge concerning vocational subjects and their profession, i.e. the content pattern of their work is identical with their learned fields, and they only show a considerable structural distance from the employment as a teacher (*Veroszta, 2012*).

2. The survey

I want to reveal the staying on the career, career abandoning, their components and characteristics, of the engineer-teachers graduated from the College of Dunaújváros, on the basis of the data of the past 5 years. The persons involved in the survey were all graduates from the shared teacher training scheme.

2.1. Hypothesis of the survey

According to my presuppositions, it could be shown that among the graduates from the engineer-teacher MA scheme of the College of Dunaújváros between 2008-2013 career abandoning is less characteristic. At the same time, we can witness the forming of a smaller group, the members of which detain hardly or at all any engineering or teaching experience ("career-starters") and were driven to obtain a newer degree or qualification by the principle of "standing on more feet", but, following their graduation, they enforce the group of those who stay in career.

2.2. The tool of the survey

The questioning was done using an online questionnaire in summer 2014. The questionnaire was sent out to a number of 263 former students who graduated between 2008-2013. On the basis of the filled-out and returned questionnaires, we processed 62 of them.

3. Results

3.1. Basic data of the questioned

Out of the questioned, 72.6% are male and 27.4% female. As for their age distribution, the answerers are aged between 27 and 60, their average age is 41.8.; the majority is aged between 30-35 and 40-45. Regarding their domicile, a great number of them live in Fejér county (27.4%) or in the neighbouring counties (35.5%); the majority of them are living in towns (77.4%). On the basis of the processed questionnaires, only very few of them (8 persons) have gained a new degree after the College of Dunaújváros.

3.2. Further training

Concerning their plans for further training, we can say that more than half (53.2%) of the answerers declared that they would probably take part in trainings assuring further degrees or qualifications. As for the linking of their intention for further training, the answerers would acquire new knowledge (37%) or degrees (33%) primarily connected to their work.

3.3. Data connected to work

As for their employment, the answerers already work for not their first, but their many times further employer, and they are willing to obtain even a newer degree ($r=0.260$; $p=0.041$). In the case of their 83.8% majority, they work in schools and only 10 persons are employed elsewhere. They got employment mostly within the vocational training, and they work in vocational schools, vocational training schools or in institutions that unite these (61.5%).

3.4. Relationship to the teaching career

After the graduation as teachers, the majority of our former students got employment within the teaching career (75.4%), but nearly one quarter are working not on the teaching career, but in engineering

field, primarily in industry. A proportion of 45% of the questioned are performing teaching tasks, while the remaining ones, the more than 50%, are doing engineer's jobs or jobs near to engineer's work. Some 17.7% of them have left the teaching career, complaining of their poor remuneration, but they also mentioned their low social prestige, and, as other factors, they listed the over-regulated school conditions, as well as the lack of promotion possibilities. A proportion of 43.5% of them have never left the teaching career, primarily due to the love of teaching, motivation, interest, or the security – the secure job.

Those who were working for only a short time (1-2 years) and mostly in their first job, namely the graduates who can be classified as young ones did not leave the teaching career ($r=0.429$; $p=0.001$). Nevertheless, the answers include such a group (16.7%) the members of which have never worked as a teacher.

Some 83.9% of them use their teacher's degrees in their current jobs, even if they are not employed as teachers, but, for instance, as engineers – training engineers. Those who do not use their teacher's degrees have, characteristically, left the teaching career ($r=-0.441$; $p=0.000$); and those who, after their graduation, have got employment in teaching, are still using their teacher's degrees ($r=0.453$; $p=0.000$). Out of those who are currently working as teachers, some 12.9% are planning to quit the career in the future, primarily due to the income conditions, the low general appreciation and the problem of the burnout. On the other hand, those who decided to continue to stay on the teaching career, have mentioned, in quite large numbers – beside the love of the career and profession, the motivation, as primary causes – also the factor of the career satisfaction.

Those who leave the teaching career, characteristically, all come from the sphere of those who teach/work in vocational secondary schools and vocational training schools ($r=0.524$; $p=0.000$). The employment, after graduation, in other (non-teaching) careers was characteristically frequent among them. Those who are planning to leave the teaching career are, characteristically, the engineer-teachers graduated from the field of information technology ($r=0.396$; $p=0.028$), while those who gained an engineer-teacher degree in the field of mechanical engineering are not planning to leave the career.

4. Summary

The results of the questionnaire survey show that the factors that make the career abandoning and the staying in the career probable can be signaled. Thus, we could see that the leaving of the teaching career is independent from the sex, but can be correlated with the age.

It was also revealed that those who previously left the career were mostly teachers and workers of vocational secondary schools and vocational training schools. Their inclination to leave the career is increased by the fact that they do not want any longer to gain knowledge or degree connected with a new work. Those who plan this, want to leave the career primarily for financial reasons, and only secondly for the low social appreciation or other points.

That smaller group composed of young graduates who have spent only a little time in the career is really present, who probably got into the teaching career after a not really conscious choice, but are characterized by the staying in the career.

As a summary, we can say that the engineer-teacher training according to the “Bologna system” obviously helps the staying in the career.

References

- Mihály, Ildikó: Pedagógusok pályaelhagyása [Career abandoning of teachers], *Szakképzési Szemle* XXVI. évfolyam 2010/1., p105-110
- Chrappán, Magdolna: Pályaelégedettség és karriertervek a pedagógus képzettségű hallgatók körében [Career satisfaction and career plans among students with teacher's qualification]. In: Garai, Orsolya et al. (edit.): *Diplomás pályakövetés IV. Friss- diplomások 2010*. Educatio Társadalmi Szolgáltató Nonprofit Kft. 267–286.
- Chrappán, Magdolna: Elégedettség és mobilitási esélyek a pedagógusképzésben végzettek körében [Satisfaction and chances of mobility among graduates of teacher training]. In: Garai, Orsolya et al. (szerk.): *Frissdiplomások 2011*. Educatio Társadalmi Szolgáltató Nonprofit Kft. 231–263.
- Tóth, Péter (2010): A mérnöktanárképzés helyzete a Bologna-folyamatot követően II [The situation of the engineer-teacher training following the Bologna process II]. *Szakoktatás*, 60. évf. 9. sz. p18-24
- Varga, Júlia: Kiből lesz ma tanár? A tanári pálya választásának empirikus elemzése [Who will become a teacher today? Empirical analysis of the choice of the teaching career]. *Közgazdasági Szemle*, 2007. július–augusztus.
- Veroszta, Zsuzsanna: A tanári pályaelhagyás szaktárgyi mintázata [Vocational subject pattern of the career abandoning of teachers], *Educatio* 2012/4., p607-618.

ARE BOOKSELLERS ENCOURAGING THE CULTURAL EXTINCTION OF SCIENCES? A LONGITUDINAL STUDY REGARDING THE OVERSTAYED WELCOME OF PSEUDOSCIENCES IN BOOKSHOPS OF QUEBEC

Carole Sénéchal¹ & Serge Larivée²

¹*Faculty of Education, Ottawa University (Canada)*

²*University of Montreal (Canada)*

Abstract

In this communication, we present the results of a longitudinal study on the proportion of space devoted, on the one hand, to books of pseudosciences (paranormal, the occult, new age, methods of divination, etc) and of sciences for adults; and on the other hand, on the proportion of space devoted to books of spirituality and sciences for children in the bookstores of Quebec. Two measures were taken, one in 2001 in 55 bookstores, and the other one in 2011 in 72 bookstores. Statistical analyses were conducted only on the measures taken in the bookstores that were visited at the two measurement times. Results from correlational analyses show that those bookstores that devote more space to books of pseudosciences for adults ($n = 40$) and to books of spirituality for children ($n = 38$) are the same in 2001 and 2011. Moreover, a repeated measures ANOVA indicate that the proportion of space devoted to books of pseudosciences for adults had decreased at the second measurement time, which is not the case for books of spirituality for children. After briefly revisiting the methodology and results, we put forward four reasons that may explain the popularity of pseudosciences, as well as a few ethical and social consequences from their fashion. In our concluding remarks, we suggest two solutions to promote scientific reasoning among adolescents and children.

Keywords: *Bookstores, pseudosciences, science, longitudinal study.*

SCHOOL ADMINISTRATORS. IN GOOD OR BAD PSYCHOLOGICAL HEALTH?

Carole Sénéchal & Michel St-Germain

Faculty of Education, Ottawa University (Canada)

Abstract

In 2012-2013, a research regarding the psychological health of administrators in French-language schools of Quebec and Ontario was conducted. Its goal was to document the state of their psychological health in the context of their work environment without strictly resorting to non-health measures (i.e. stress or burn-out) and to identify the active and operational components of their workspace. The questionnaire was comprised of 32 statements subdivided in 13 categories (work environment, justice, needs, evaluation of the position, psychological well-being, resiliency, maladaptation, adaptation, health, emotions in the workspace, psychological distress, perception of one's own competence, political skills). A Five-Point Likert-Type Scale (with 6 points on a select few categories) was used. The questionnaire was sent to administrators via email in 2012. 232 replies were obtained from school administrators in Quebec, and 73 from their Ontarian counterpart. Results show that school administrators were in good psychological health overall, but it is important to point out that this trend was not displayed amongst all administrators. An in-depth analysis of variables such as in-family caring and the years of experience coupled with interviews of school administrators on sick-leave due to burnout and fatigue overload could shed some light on the process of transitioning from a working to a non-working situation.

Keywords: *School administrators, psychological health, burnout.*

1. Introduction

Psychological health can be seen as the result of an integrative process characterized by inductors such as the workspace environment, organisational justice, the alignment of performance expectations with the availability of resources, resiliency, the perception of one's own competence, and political skills. Each person may have an entirely different reaction to a given situation. Why? Because of the presence of mediators (such as the various needs in terms of affiliation, competency, and autonomy) and socio-demographic factors (age, gender, experience, school size, the level of education, etc.) which may have an impact on the perception and subsequent reaction of an individual faced with the aforementioned inductors. The effect of this mediation is reverberated in the overall workspace psychological health which is illustrated by four main aspects: psychological well-being, distress, adaptive behaviour, and on the other hand, maladaptive behaviour.

In 2012-2013, a research was conducted in order to examine the psychological health of principals in French-speaking schools of Quebec and Ontario. Its goal was to document the state of their psychological health in the context of the work environment without resorting to strictly non-health measures (i.e. stress or burn-out) and to identify the active and operational components of the work space. Also, we wanted to identify the ways by which one could correct, maintain, or elevate psychological health. A number of statistical analyses were performed using SPSS (Statistical Package in Social Sciences) in order to report on the descriptive statistics. However, the correlation between the different categories was not explored.

The questionnaire was comprised of 232 statements subdivided in 13 categories (17 items for work environment, 20 for justice, 13 for the needs, 25 for the evaluation of the position, 25 items for the psychological well-being, 15 for resiliency, 15 for maladaptation, 16 for adaptation, 11 for health, 7 for emotions in the workspace, 23 for psychological distress, 19 for perception of one's own competence, and 18 for political skills). A Five-Point Likert-Type Scale (with 6 points on a select few categories) was used. The questionnaire was sent to principals via email in 2012. 232 replies were obtained from school principals in Quebec, and 73 from their Ontarian counterpart.

This research presents the results regarding psychological health, distress, adaptation and

maladaptation of school principals in French-speaking schools of Ontario. The results are divided in three categories: a) global results, b) gender-dependant results, and c), level-dependant results

2. Results on the Psychological Health

Table 1. The psychological well-being according to gender and the level of teaching (by descending order of global average)

Psychological well-being	global	Women	Men	Elementary	High school
Valid answers	73	48	25	51	16
<i>Lately, in the context of employment</i> <i>1-Not always / never....5-Always / regularly</i>					
11) I pay attention to what my colleagues have to say.	4.32	4.40	4.16	4.29	4.25
12) I am curious, and have an interest in various things.	4.22	4.23	4.20	4.27	3.88
18) I am in good terms with my work colleagues and employees.	4.22	4.23	4.20	4.25	4.06
6) I have goals and ambitions.	4.15	4.27	3.92	4.12	4.13
13) I can make a well-considered decision when faced with complex situations	4.14	4.06	4.28	4.16	4.06
9) I have a ready smile.	4.10	4.21	3.88	4.10	3.94
8) I feel useful.	4.04	4.08	3.96	4.06	3.81
3) I am a go-getter, I undertake many different projects.	4.03	4.00	4.08	3.92	4.25
25) I am generally in good spirits.	3.99	3.98	4.00	3.96	3.81
10) I am authentic and natural in all circumstances.	3.95	4.00	3.84	3.94	3.81
17) I can easily find solutions to my problems.	3.93	3.96	3.88	3.96	3.75
1) I feel confident.	3.86	3.88	3.84	3.78	3.94
2) I am satisfied with my realizations, I am proud of myself.	3.86	3.88	3.84	3.76	4.00
24) I know how to face difficult situations with a positive attitude.	3.82	3.88	3.72	3.76	3.81
16) I am generally calmed and grounded.	3.78	3.79	3.76	3.80	3.69
22) I feel good about myself, at peace with myself.	3.78	3.77	3.80	3.76	3.69
14) I find my work to be exciting and I want to take advantage of it.	3.77	3.92	3.48	3.73	3.69
4) I feel emotionally stable.	3.71	3.85	3.44	3.78	3.50
21) I have a good sense of humour, and I can easily make my colleagues laugh.	3.71	3.69	3.76	3.73	3.50
20) I really feel like I am enjoying my line of work.	3.68	3.77	3.52	3.67	3.56
5) I feel loved and appreciated.	3.53	3.65	3.32	3.45	3.50
23) I feel like I am in good general health.	3.07	3.15	2.92	3.14	2.75
7) I still enjoy practicing my favorite activities and hobbies.	2.92	2.88	3.00	2.90	2.94
19) I work with moderation and I try to avoid overworking myself.	2.82	2.83	2.80	2.86	2.63
15) I have a balance between my professional, familial and personal activities.	2.51	2.54	2.44	2.49	2.38
average	3.76	3.80	3.68	3.75	3.65

Highlighted: A significant difference indicates a result that was not obtained due to a random chance alone, and was rather due to socio-demographic (gender) or organisational characteristics (level of education). An average of 3.78 is considered identical to an average of 4.04 if there is no significant difference. The differences that are significant are highlighted.

The average is 3.76 (the latter is 3.81 for principals in schools of Quebec, but this difference is not significant). The scores for 22 of the 25 items are superior to 3, the mid-point of the Likert-Type Scale which was used. Additionally, 8 of the items present an average that is over 4.00. Among those items, three of them suggest the presence of an excellent relationship between the principals and the teachers at the elementary and high school levels of education (items 11, 18 and 9). Although coefficients of variation are not presented in this text, the answers to these items indicate a clearer consensus than that of the last items (23, 7, 19, and 15). This suggests that there is a certain indisposition among principals, a situation which necessitates further examination.

Moreover, for two reasons, we must emphasize the importance of the last three items: 7 (I still enjoy practicing my favorite activities and hobbies), 19 (I work with moderation and I try to avoid overworking myself), and 15 (I have a balance between my professional, familial, and personal activities). Firstly, the averages are quite low, whether at the elementary or high school levels of education: it seems to indicate a generalized uneasiness among principals. Secondly, when comparing Ontario to Quebec schools, there is a significant difference in between the two provinces for these specific items. It may be that, when compared to principals of schools in Quebec, those in Ontario are having a more difficult time balancing their professional, social and familial life. As such, it is becoming

increasingly evident that the workload that comes with the direction of an Ontarian French-speaking school may have a negative impact on life outside of school.

As for the gender, there is no significant difference between principals in Ontario. For the level of education, there is a single significant difference between the elementary and high school levels for item 12 (I am curious, and have an interest in various things), where principals of elementary schools show a higher average ($m=4.27$) than their high school counterparts ($m=3.88$).

When comparing the two provinces, the items reporting on the quality of life outside of school present significant differences: item 7, I still enjoy practicing my favorite activities and hobbies (elementary in Ontario, $m=2.90$; primary school in Quebec, $m=3.36$); item 15, I have a balance between my professional, familial and personal activities (elementary in Ontario, $m=2.49$; primary school in Quebec, $m=3.23$) and item 19, I work with moderation and I try to avoid overworking myself (elementary in Ontario, $m=2.86$; primary school in Quebec, $m=3.33$). There is also a significant difference between principals of elementary schools of Ontario (3.73) and those of Quebec (3.49) for item 14 (I find my work to be exciting and I want to take advantage of it).

In essence, what we can conclude from these findings is that psychological well-being of principals in French-speaking schools of Ontario is satisfactory (global: $m=3.76$, female principals: $m=3.80$, male principals: $m=3.68$, elementary level: $m=3.75$, high school level: $m=3.65$). These results are similar to those found by Savoie, Brunet and other researchers who evaluated well-being and general health in the context of work for different professions. In addition, Dagenais-Desmarais et al. (2006) obtained scores varying between 3.52 and 4.26 (with standard deviations ranging from .69 and .95) in their study. Savoie et al. (2013) obtained an average of 3.86 (with a standard deviation of .53).

References

- Savoie, A., Gilbert, M.-H., Brunet, L., Boudrias, J.-S., & Courcy, F. (2013). Modèle prévisionnel de la santé psychologique au travail, 5-12. In A. Balikdjian, C. Lemoine, N. Kridis & P. Salengros (Éds). *Santé psychologique, stress et harcèlement au travail*. Actes du 14e congrès de l'AIPTLF tenu à Hammamet, Tunisie en 2006. Vol. III. Lille: Éditions de l'AIPTLF.

21ST CENTURY FOREIGN LANGUAGE TEACHING: MAPPING TEACHER EDUCATORS' ICT ATTITUDES, KNOWLEDGE, AND SKILLS

Maurice Schols

Teacher education institute, Fontys University of Applied Sciences (The Netherlands)

Abstract

To effectively incorporate emerging technologies into secondary schools, teacher educators in foreign language teaching must understand the imperatives of information and communication technologies (ICTs) that are driving the revolution. To prepare student teachers for their future roles in a global knowledge-based society, it requires not simply the traditional reading and writing skills, but learning how to communicate using different media with people in different cultural contexts. Current pedagogical approaches to using technologies in second language teaching largely reflect 20th century pedagogy of applying ICTs as a means of increasing the effectiveness of traditional instructional approaches. Pressures to change and improve second language teaching due to new technologies which are transforming every aspect of daily life have forced a rethinking of education. This means that those who teach the next generation of language teachers, need to acquire new theoretical insights and skills with regard to how learning is conceived. However, traditional technology professionalization programs cannot cope with the rising demand on teacher educators to make use of emerging technologies in their language teaching. Investigating the level of ICT attitudes, knowledge, and skills among teacher educators is a prerequisite for developing adequate technology professionalization programs. In this study, Design-Based research as a research methodology can contribute to the development of an instrument which makes it possible to map teacher educators' ICT attitudes, knowledge, and skills. In so doing, the research attempts to add to the emerging knowledge base concerning teacher educators' technology professionalization.

Keywords: *Teacher educators, ICT skills, technology professionalization, language teaching.*

1. Introduction

There is a global awareness of the fundamental role and potential benefits of emerging technologies in education. Theoretical and empirical studies underscore the importance of ICT in teaching and learning and as a result teacher educators are faced with equipping student teachers with 21st century knowledge and skills. The increasing need for teacher education institutions to meet society's demands forces a rethinking of how to professionalize their educators in such a way to be competent enough to cater their student teachers' learning needs and wishes.

To prepare student teachers to communicate in a global society in which emerging technologies are used in different global contexts requires not only the traditional reading and writing skills, but learning how to communicate and use new technologies that are needed for tomorrow's teaching role. However, simply putting ICT into the schools will not accomplish the task. Teaching staff at teaching education institutions need to acquire new theoretical insights as well as skills with regard to how learning is conceived (Brandsford, Brown & Cocking, 1999; Putnam & Borko, 2000).

In order to reap the benefits of using ICT in teaching foreign languages, it is essential that teacher education institutions assume a leadership role in the transformation of education (Schols, 2012; Miller & Ribble, 2013). However, despite the fact that there are teacher education institutions which provide teaching staff with basic ICT knowledge and skills, the attention given to the use of emerging technology and the required knowledge in teacher educators' technology professionalization programs is not up to par. Mapping teacher educators' ICT knowledge and skills is therefore imperative with regard to the design of meaningful professionalization programs.

2. The aim of the study and research questions

The research presented in this paper is part of an ongoing study and based on earlier work (Schols, 2014) which is being carried out at a teacher education institution in The Netherlands. The general aim of this study is to make a worthwhile contribution to the issues of foreign language teacher educators with regard to their use of new technologies for educational purposes. More specifically, the ongoing research attempts to investigate and gain insight how to design and develop an instrument that can be used to map teacher educators' ICT attitudes, knowledge, and skills in language teaching.

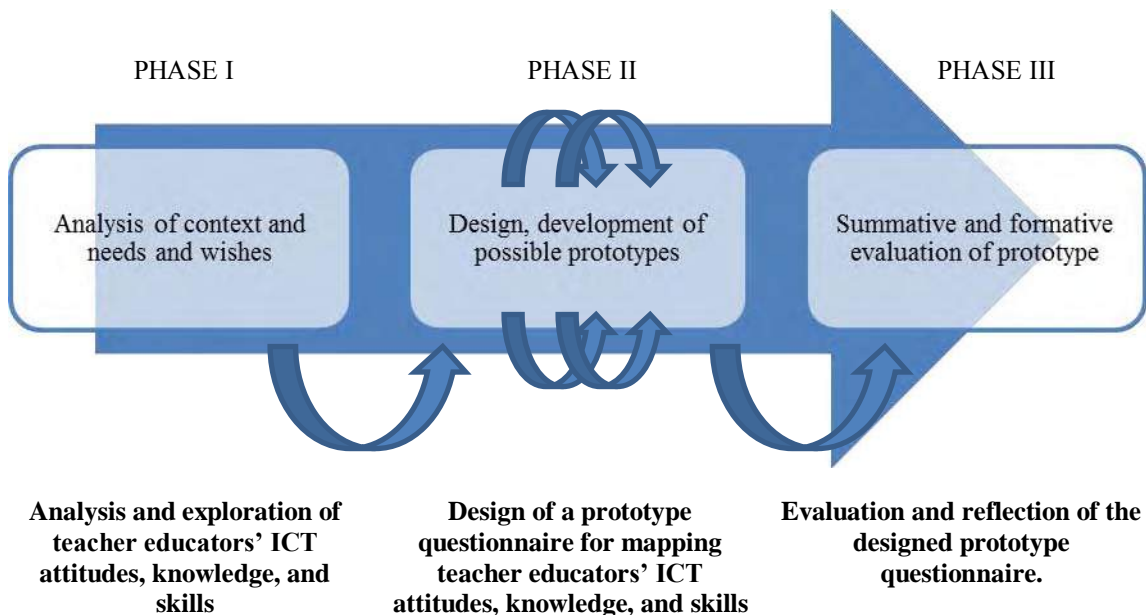
Despite the expansion of ICT use in teacher education institutions, the body of empirical research investigating the level of ICT use for educational purposes is still relatively small. The use of technology by teacher educators in foreign language education in particular remains an emerging field of investigation. The central research questions the study seeks to explore are:

- 1) What are teacher educators' ICT attitudes?
- 2) What is the level of ICT knowledge and skills among teacher educators in foreign language teaching?
- 3) In what way can an instrument be developed which can be used to map teacher educators' ICT attitudes, knowledge, and skills?

3. The proposed research methodology and methods

The study employs a Design-Based research approach which focuses on teacher educators' technology professional learning and which employs research processes and methods to create and study innovation in authentic teaching and learning contexts (Van den Akker et al, 2006; Plomp & Nieveen, 2010). Within Design-Based research, solutions to complex problems of practice are conceptualized and then implemented and studied iteratively and collaboratively by researchers and teacher educators in educational settings. Design-Based research consists usually of several phases: a preliminary phase, a prototyping phase, and an evaluation phase.

Figure 1. Overview of research model. Adapted and revised from Plomp and Nieveen (2009)



To address the research questions, a mixed methods approach is used to examine the data collected and analyzed in the different research phases. Using a mixed methods design makes it possible to combine the strengths of both quantitative and qualitative research approaches (Greene, 2007; Teddlie & Tashakkori, 2009; Creswell & Plano-Clark, 2011). When used in combination, both research methods, quantitative as well as qualitative complement each other (Teddlie & Tashakkori, 2009; Creswell & Plano-Clark, 2011).

In this study, the focus is on the design and development of a questionnaire that consists of four different categories based on a thorough research review during research phase I. The four categories are:

- 1) ICT attitudes, 2) ICT instrumental knowledge and skills, 3) digital media and information literacy, and
- 4) pedagogical knowledge and skills.

4. Expected contribution to knowledge and practical implications

The study attempts to contribute to knowledge by addressing teacher educators' technology professionalization issues and focuses on a gap in the literature. The chosen methodology aims to improve teacher educators' technology professionalization through the iterative analysis, design, development and evaluation in real-world educational contexts. Research demonstrates that technologically trained teachers develop positive attitudes toward emerging technologies and as a result, are more willing to integrate ICT into their language teaching (Ashburn & Floden, 2006; Barton & Hayden, 2006). Gaining more insight into ICT attitudes, knowledge and skills will obtain information how to design and develop a questionnaire that can be used as an instrument to map teacher educators' ICT knowledge and skills. Moreover, gaining a better understanding of perceived technology use can contribute to the improvement of technology professionalization programs. Consequently, adequate technology training will enable teacher educators to prepare their own student teachers with sufficient ICT knowledge and skills which, in turn, will prepare them for their future roles in a knowledge-based society.

References

- Ashburn, E., & Floden, R. (2006). *Meaningful learning using technology*. New York: Teachers College Press.
- Barton, R., & Hayden, T. (2006). Trainee teachers' views on what helps them to use information and communication technology effectively in their subject teaching. *Journal of Computer Assisted Learning*, 22, 257-272.
- Bransford, J., Brown, A., & Cocking, R. (1999). *How people learn: Brain, mind, experience, and school*. Washington: National Academy Press.
- Creswell, J., & Plano-Clark, V. (2011). *Designing and conducting mixed methods research*. London: Sage Publications.
- Greene, J. (2007). *Mixed methods in social inquiry*. London: Wiley.
- Miller, M., & Ribble, T. (2013). Educational leadership in an online world: connecting students to technology responsibly, safely, and ethically. *Journal of Asynchronous Learning Networks*, 17(1), 137-145.
- Plomp, T., & Nieveen N. (2010). An introduction to educational design research. *Proceedings of the seminar conducted at the East China Normal University*, Shanghai (PR China), November 23-26, 2007, SLO, Netherlands Institute for Curriculum Development.
- Putnam, T., & Borko, H., (2000). What do new views of knowledge and thinking have to say about research on teacher learning? *Educational Researcher*, 29(1), 4-15.
- Schols, M. (2012). Examining and Understanding Transformative Learning to Foster Technology Professional Development in Higher Education. *International Journal of Emerging Technologies in Learning*, 7(1), 42-49.
- Schols, M. (2014). Mapping student teachers, teachers, and teacher educators' perceived ICT knowledge and skills [CD]. *Edulearn14 Proceedings*, 2007-2010. ISBN: 978-84-617-0557-3.
- Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods*. London: Sage Publications.
- Van den Akker, J., Gravemeijer, K., McKenney, S., & Nieveen, N. (2006). *Educational Design Research*. London: Routledge.

“OF COURSE, I CONTROL IT”: COMPARATIVE STUDY OF TEACHERS’ EMOTIONS IN UPPER SECONDARY EDUCATION (SECONDARY GRAMMAR AND SECONDARY VOCATIONAL SCHOOLS)

Judit Sass, Éva Bodnár, Horváth H. Attila & Krisztián Pálvölgyi
Hungarian Institute for Educational Research and Development (Hungary)

Abstract

Teachers’ level of emotional strain is higher than average and teachers in vocational schools face even higher levels of strain on account of high drop-out rates and the large number of disadvantaged students in Hungary. As part of a project aimed at the renewal of teacher training, we have focused on preparing prospective teachers to approach emotion-evoking situations in a stress-reducing way (Forman, 2013).

Our goal was to compare teachers’ emotion scripts in secondary grammar, secondary vocational and vocational schools and to investigate influencing personality and organizational factors.

Study: We have interviewed 161 teachers about their emotional experience and measured the influencing factors: positive and negative affectivity and emotional climate.

Results: We have found that positive feelings and anger are somehow controlled but accepted emotions, but teachers control more other negative emotions. Inertia is more frequently mentioned by vocational teachers. Deep acting control of grammar school teachers was higher and negative affectivity was significantly lower, while surface acting control was higher among vocational teachers. Level of deep acting was influenced by negative components of emotional climate.

Conclusions: Teachers’ negative emotions are under control. Vocational teachers should be helped to develop their ability to exercise deep acting control to reduce level of experienced stress.

Keywords: *Teachers’ emotion strain, emotion scripts, deep and surface acting, PANAS, higher education*

1. Introduction

According to data (SE, 2013), teachers’ level of emotional strain (67 %) is above the average level of Hungarian employees (42%). Furthermore, teachers in vocational schools face higher level of strain because of the high rate of early school leavers, disadvantaged students and high drop-outs (Bükki.& al, 2012). This study was supported by a project that aimed to renew teacher training. We focused on how to prepare prospective teachers to approach situations with emotional consequences in a stress-reducing way (Forman, 2013).

There is an agreement in psychological and sociological literature that emotions have biological roots; however, cultural and social processes play an important role in the experience and expression of emotions as well. Based on different research of the sources and frequency of teachers’ emotions, it is clear that emotions stem from subjective appraisal of situations, (Lazarus, 1999). There are frequently experienced positive (happiness, love, caring, joy, satisfaction, excitement, pride, gratitude) and negative emotions (anger, anxiety, inertia, guilt, shame, boredom, sadness, fear) among teachers (Hargreaves, 2001; Frenzel, 2014; Sutton & Wheatley, 2003). Weiss and Cropanzano’s (1996) ‘Affective Events Theory’ assumes that affective experiences derive from the content of the profession, workplace interactions, hassles and uplifts during working days. All of these experiences are mediated by positive affectivity (PA) that means disposition to experience positive emotions, and negative affectivity (NA) that is propensity to experience distress and negative emotions. Emotional reactivity influences emotional experiences and their consequences (e.g. satisfaction, counterproductive workplace behaviour) as well.

Nature and dependence of the job, affective traits of workers, group cohesion, leadership and norms of emotion regulation affect mood in the workplace. This emotional climate is a group level phenomenon and is the result of members’ social interactions. Positive or negative climate (PC, NC) is experienced by the members and influences level of activation and emotional experiences in the group (De Rivera & Paez, 2007).

Nevertheless, in connection with the work-role there are specific explicit and/or implicit rules regarding emotional display in work settings. This emotion work is special forms of emotion with the function of enabling effective interpersonal transactions (Hochschild, 1983). Control of emotions may appear at two different levels. Surface acting means regulation of emotions when they are expressed, while deep acting means anticipatory intervention.

There has been no systematic research on the special features of experienced emotions and emotion regulation in different educational settings (secondary grammar and vocational schools). There are contradicting results about the effect of emotion control on workers' well-being. According to the literature, the higher the effort one has to make to produce the expected emotion, the higher the experienced work strain will be (Hochschild, 1983). If there is emotional dissonance between subjective experience and public display of emotion, the strain is higher (Tsang, 2011). It can be assumed that both individual and organizational variables influence workers' emotions and emotion regulation. Recent research on the field tries to identify consequences of this control.

Our goal was to compare teachers' affective experiences (frequency of different emotions, emotion scripts, emotion labor) in grammar and vocational schools, and to investigate possible influencing personality (positive and negative affectivity) and organizational (emotional climate) factors.

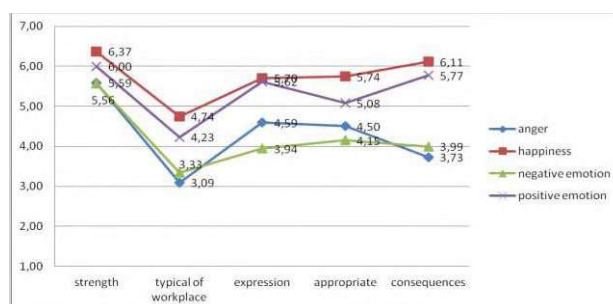
2. Experimental design and methods

We have interviewed 161 teachers from 4 secondary grammar schools, 5 vocational and secondary vocational schools = "VET institutions" and 5 schools that offer both grammar and vocational school programmes = "mixed type" using a modified version of Gibson's (2006) semi-structured interview, the "Emotions at work" (anger, happiness, one optional positive and one negative emotion). We also measured the influencing factors: PA and NA with PANAS (Watson, Clark & Tellegen, 1988) and emotional climate with the Emotional Climate scale (Wiesenfeld & al, 1997). Furthermore, we investigated perceived level of surface and deep acting with the Emotional Labor Scale (Brothridge & Lee, 1998). 57.5 % of respondents were female (N= 107) and 28% were male (N=52) /14.5 % missing data/, with a mean age of 45.18 years and with a mean teaching experience of 19.04 years.

3. Results

Both positive and negative emotional experiences were high, but positive emotions were stronger, more appropriate and resulted in more positive consequences than negative emotions; furthermore, the control of expression was higher for negative emotions.

Figure 1. Patterns of teachers' emotions



Common sources of negative experiences were lack of discipline and motivation of students, while positive emotions were triggered by being together with a particular student or a class, their expressed interest in the subject and the success of teaching or students' results.

There were no differences in teachers' anger scripts according to school type, but optional negative experience significantly differed. The most frequently mentioned negative experience was inertia. In "VET institutions" inertia was mentioned by 64 %, anxiety and sadness by 13 and 12 %, respectively. Control of anger and alternative positive emotion was the lowest in this type of school, and here teachers were more likely to regulated expression of happiness. In *grammar schools* evaluation of negative emotions were lower than in other school types, while control and repression were higher. Inertia occurred in 53 % of the cases, sadness in 21% and anxiety in 14 %. Teachers reported about motivating consequences of positive experiences. In "*mixed schools*" perceived level of negative experiences was the highest, and evaluation of happiness was the lowest. The success of teaching was not mentioned, but the occurrence of inertia was only 41 %, anxiety 14 %, while sadness with 31 % was higher.

Evaluation of the level of deep and surface acting our was contradicting. Altogether the mean level of the judged frequency of emotion regulation was low, in a 5-grade scale only 2.29 for surface acting and 2.55 for deep acting. There were significant differences according to deep acting. It was higher in vocational schools than in the other two types of schools.

According to the influencing individual and organizational factors, level of PA was higher; while NA was lower than average in our sample. There were no significant differences between evaluations of emotional climate in the different types of schools. In a 5-grade scale perceived average PC (3.32), NC (2.05) was low, respectively. In grammar schools the result was better (Average PC=3.51, Average NC=1.95) than in the other two school types. NC and PA positively correlated with strength of felt anger and positive emotions.

4. Conclusions

In sum, expression of both positive and negative emotions has greater acceptance in educational context. There is a bias toward the experience of positive emotions especially in NC. Higher level of positive affectivity also supports this tendency. Results indicate that positive emotions may serve as tools for coping.

Differences of type of schools indicate that in “mixed types” the level of positive experiences is low and the level of inactivating negative emotions is higher. In “VET institutions” anger is less controlled and level of deep and surface acting is higher, teachers express their deactivating negative emotions more than in the other types of schools; however, they gain resources from positive experiences with being together with their students. In “grammar schools” expression of negative emotion is highly regulated, while experience of positive emotions is amplified and serves as a motivating factor to compensate perceived higher strain.

References

- Brotheridge, C. M., & Lee, R. T. (2003). Development and validation of the Emotional Labour Scale. *Journal of Occupational and Organizational Psychology*, 76 (3), 365-379.
- De Rivera, J., & Páez, D. (2007). Emotional climate, human security, and cultures of peace. *Journal of Social Issues*, 63, 233-253.
- Forman, S. G. (2013) Teacher Stress Management: A rational-emotive therapy approach In: DiGuiseppe, R., Bernard, M.L. (Eds.) *Rational-emotive consultation in applied settings School psychology series* 107-127.
- Frenzel, A. C. (2014) Teacher Emotions In: Alexander, P.A., Pekrun, R., Linnenbrink- Garcia, L.(Eds.) *International Handbook of Emotions in Education* pp.494- 519, London: Routledge.
- Gibson,D.E. (2006). Emotional Episodes at Work: An Experiential Exercise in Feeling and Expressing Emotions. *Journal of Management Education*, 30 (3), 477-500.
- Hargreaves, A. (2001) The emotional geographies of teaching. *Teachers' College Record*, 103 (6), 1056-1080.
- Hochschild, A. R. (1983). *The managed heart: Commercialization of human feeling*. Berkeley, CA: University of California Press.
- Lazarus, R. (1991) *Emotion and adaptation* New York: Oxford University Press
- Országos munkahelyi stressz felmérés eredmények, Semmelweis Egyetem (SE) (2013) Retrieved 04.04.2015 from: <http://www.munkahelyistresszinfo.hu/a-munkahelyi-stressz-merese/munkahelyi-stressz-felmeres-eredmenyek/>
- Sutton, R.E. & Wheatley, K.F. (2003) Teachers' emotions and teaching: A review of the literature and directions for future research *Educational Psychology Review* 25 (4) 327-358
- Tsang, K.K. (2011) *Emotional labor of teaching*. *International Research Journals*, 2 (8), 1312-1316.
- Bükk, E., Domján, K. Vinczné Fekete, L. & Mártonfi, Gy (2012) Hungary: VET in Europe – Country report Oktatásfejlesztési Observatory Központ, Budapest.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of Positive and Negative Affect: The PANAS Scales. *Journal of Personality and Social Psychology*, 54,1063-1070.
- Weiss, H. M., & Cropanzano, R. (1996). An affective events approach to job satisfaction. In Staw B. M. & Cummings L. L. (Eds.), *Research in organizational behavior*, Vol. 18, (1-74), Greenwich, CT: JAI Press.
- Wiesenfeld, E., Kornblit, A., Vidal, C.M., Ruiz, J.I., Rovira, D.P. & Gailly, O. (1997) Clima emocional: su concepto y medición mediante una investigación transcultural *Revista de Psicología Social* 12 (1), 79-98.

STUDENTS, PARENTS AND TEACHERS' VIEW ON EXTRA-CURRICULAR EDUCATIONAL PROCESSES IN SCHOOL

Joanna Kołodziejczyk

Institute of Public Affairs, Jagiellonian University (Poland)

Abstract

The institutional education of students goes beyond the matters connected directly to the didactic process itself, realized in the classroom. Extra-curricular classes, activities and educational initiatives are a significant element of the functioning of students in school. The article presents the areas of extra-curricular educational processes in Polish schools and the opinions on them given by various school subjects: students, teachers and parents. The aim of the research is to seek the answer for the question about their vision of extra-curricular educational processes as compared to required classes. The analysis embraces issues connected to the perception of extra-curricular educational processes and their importance for students development by various school subjects. The analysis is based on the data coming from external evaluations carried out in Polish schools. The research shows, among other things, that students evaluate extra-curricular activities better than required classes, they have a more positive attitude towards learning. The research indicates also that teachers associate students' activity and development of interests mainly with extra-curricular educational processes.

Keywords: *Extra-curricular educational process, students development*

1. Introduction

Learning is commonly understood as a synonym of education which is usually linked to the processes of students' development in school. It is most probably the effect of the institutionalization of learning, of the creation and constant development of organizations whose main aim is to support people in their development. As a complicated cognitive process, enabling people to function in various life situations, to adapt to the ever-changing conditions of the environment and to solve problems, learning goes beyond the walls of educational institutions of different types. However, it is still on these institutions that most of the social responsibility for organizing people's learning is placed (cf. Sysło 2011). In school learning is usually associated to the processes occurring mainly in the classroom. What seems to be an interesting problem is how learning is realized in school beyond the obligatory classes. In this paper, this issue will be discussed in the context of how extra-curricular classes are perceived by other school subjects, that is students, teachers and parents.

Polish school offers students many forms of activities beyond the obligatory classes. Among them are special interest clubs such as scientific, technical, artistic, sports or tourist clubs. Remedial classes offered to students who need extra help with acquiring the knowledge and skills established in the curriculum are another form of extra-curricular activities (Denek 2002). Apart from the forms of extra-curricular activities organized by the institutions, students participate in many other forms of activities such as student volunteering, work in the students council or any educational, artistic or environmental events prepared by the students themselves.

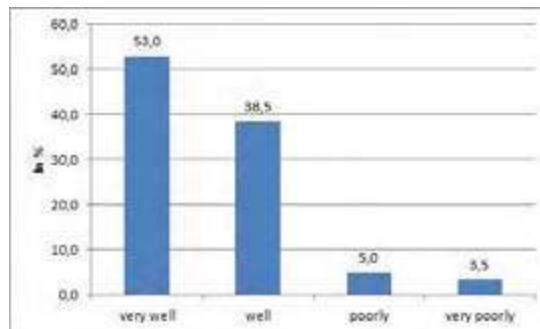
This paper tackles the issue of how extra-curricular classes and activities are perceived by students, teachers and parents. In the research, we used data coming from external evaluations of Polish school, carried out between 1st September 2014 and 31st January 2015 in secondary schools. The external evaluations are focused on the state requirements established in the Appendix to the Regulation on Pedagogical Supervision (Regulation 2013). The evaluations were carried out by school inspectors who were specifically prepared to do that. The analyzed data comes from the surveys that were filled by the respondents during the evaluations, carried out using the CAWI method in the case of students and using the PAPI method in the case of parents, and from the group interviews with students and teachers conducted in secondary schools throughout Poland. The research material is available on the website: www.platforma.npseo.pl/stats.php. The analyzed material includes parents and students' answers to three

multiple choice questions from the survey and students and teachers' statements from the group interviews.

2. The results of the Research

One of the important issues is how extra-curricular activities meet children's needs. The vast majority of parents asked to comment on that question (91.5% of all respondents) said that the extra-curricular activities meet their children's needs. Only 8.5% of the surveyed parents were of the opposite opinion (see Figure 1).

Figure 1. The distribution of the answers to the question: How do the extra-curricular activities in this school meet your child's needs? – the survey for parents, N=13131.



In the opinion of most of the surveyed students (75.5%), there are extra-curricular classes that could be considered interesting. However, it is worth noting that one in four secondary school students cannot find any extra-curricular activity that would meet their interests (see Figure 2). At the same time, 89% of the students said they could go to the classes they wanted to and almost 11% of the respondents said they did not have that possibility.

Figure 2. The distribution of the answers to the question: In my school there are extra-curricular classes that I find interesting; - the survey for students, N=10377.

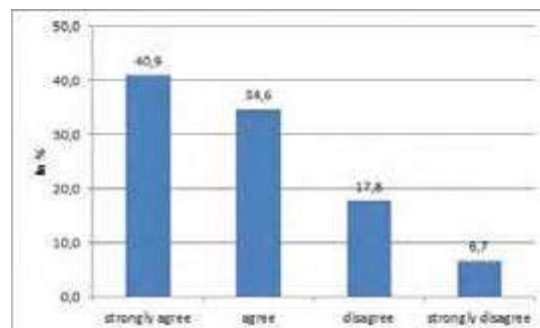
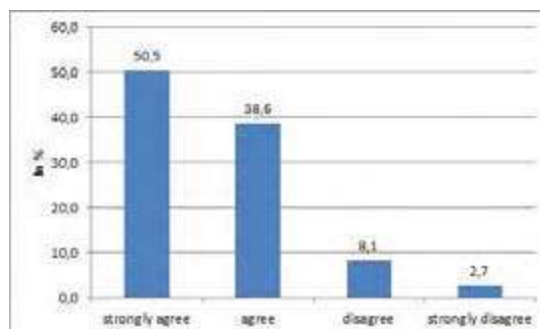


Figure 3. The distribution of the answers to the question: In my school I can go to all the extra-curricular classes I want to; – the survey for students, N=10190.



In the 63 conducted group interviews, students listed the following types of extra-curricular classes and activities they attended: extra-curricular classes of obligatory subjects, classes unrelated to obligatory subjects (e.g. journalism club, art club, film and theatre club, school choir, dance classes, chess classes, tourist club, library friends club), classes preparing for the final exams, classes preparing for

scientific or sport competitions, remedial classes, specialist (corrective and compensatory classes, rehabilitation classes), sports classes, debates, trainings for students, parents and teachers, project-based extra-curricular classes, volunteering, classes during which students prepare brochures, presentations, leaflets, plays or exhibitions, long or one-day trips, events (e.g. film nights, school discos).

The students said that they found the extra-curricular classes interesting or rather interesting, which corresponds with their opinions given in the surveys. While ranking the classes, they mentioned that they found remedial classes less interesting and chose them less often.

In the group interviews, the students listed also the ways they are encouraged to participate in extra-curricular classes by the teachers, which indirectly shows how they perceive extra-curricular classes. The analysis of the students' responses indicates that there are four main strategies teachers use to encourage students:

- 'benefits' strategy (e.g. if students go to extra-curricular classes, they get extra points for their final grade, their grade is raised, they learn new skills or they get attractive prizes)
- 'students influence' strategy (e.g. teachers let students influence the material discussed during classes, they discuss meeting dates with students, 'during these classes we can express our own ideas')
- 'external stimuli' strategy (e.g. 'theatre group rehearsals are often held before and after the classes in the main hall so you can see what they are doing – this encourages other students to join the group')
- 'distinction, recognition' strategy (e.g. students can exhibit their works in the school during school exhibitions or in the school newsletter, they can represent their school outside).

The students described also the ways of organizing and informing them about extra-curricular classes. They said that teachers informed them about planned extra-curricular activities at the beginning of the school year, carried out surveys among students, put the information on the website, on the news board, on posters, on the school radio and in the school paper, and they presented the effects of students' work on the news boards in the school. The students mentioned also that the timetable was set up in such a way that they could go to all the classes they wanted to.

In 61 group interview conducted at the same time in secondary schools, teachers discussed students' initiative in presenting ideas for what they would like to do in school and they mentioned the same forms of extra-curricular activities that those listed by the students. In the interviews, the teachers tried to establish the barriers that inhibit students' initiatives concerning their extra-curricular activity. They listed factors such as finances, no or little interest, technical limitations, legal regulations, coincidence with other school events, no room, security problems, ideological issues, students' misconduct, weather, no specialist teachers, too much workload.

3. Conclusions

The analysis shows that the range of extra-curricular classes is quite diverse and, according to parents, well adapted to students' needs. The students are not as unanimous in that respects as their parents but the majority of them finds the activities interesting. They notice that teachers actively encourage them to participate in those activities and they mention different strategies teachers use (mainly oriented to promising benefits and allowing students to influence the form of the classes) and different ways in which teachers inform about the classes. Students' initiatives discussed by the teachers in the interviews correspond with the forms of extra-curricular activities and are not connected to obligatory classes (cf. Kołodziejczyk, 2013). Thus, students see a space for themselves in extra-curricular activities, which manifests as their engagement and initiatives.

References

- Denek K., Poza ławką szkolną, Poznań 2002.
- Kołodziejczyk J., Promoting the value of education as a challenge to the contemporary school, The European Conference on Education, Brighton 2013; The International Academic Forum, pp. 682-697
- Sysło M., Czy szkoła będzie potrzebna w społeczeństwie wiedzy. Spojrzenie z punktu widzenia technologii informacyjnej, www.snti.pl/snti (access: 14th July 2011)
- Rozporządzenie Ministra Edukacji Narodowej z dnia 10 maja 2013 r. o nadzorze pedagogicznym zmieniające rozporządzenie w sprawie nadzoru pedagogicznego, Dz.U. 2013 Nr 0, poz. 560 (the Regulation of 10 May 2013 by the Ministry of National Education on Pedagogical Supervision amending the Regulation on Pedagogical Supervision, Dz.U. of 2013, No 0, item 560).

USING COMPUTER SIMULATIONS TO PREPARE FUTURE TEACHERS

Roberta Gentry

Department of Foundations, Leadership, and Special Populations, University of Mary Washington (USA)

Abstract

Simulations may be used to introduce pre-service teachers to the complexities of teaching and also to bridge the theory to practice gap in education. Within simulations, professors can change the composition of the class to include a variety of ethnicities, cultural backgrounds, achievement levels, and also include students with disabilities to scaffold candidate's learning. This also provides a model classroom for pre-service teachers to practice their skills and apply concepts learned in college courses to teaching scenarios. A brief literature review of the use of computer simulation in teacher education programs is presented and summarized including the advantages and disadvantages of using computer simulation in higher education. Finally, a pilot study in which computer simulations software was used with 12 initial licensure general education teacher candidates in an introductory to special education course will be shared. Candidates reflected on their experiences with using computer simulation. The instructor of the course will also share lessons learned.

Keywords: *Simulations, simulated learning environments, teacher education*

1. Introduction

Simulations are intended to create the effect of some real-life phenomenon so that participants have the opportunity to experience it, make decisions about it, and evaluate or witness the results of their decisions (Cruishank & Metcalf, 2010). Simulations offer a safe environment to explore possibilities and one of the advantages of simulations is they allow participants make choices and see the consequences of their decisions. Therefore, in a virtual teaching environment novice teachers can make mistakes without impacting real students. Additionally, students can reflect on their performance in the simulation and then repeat the simulation making different decisions and see the consequences of their actions. This is a distinct advantage to using simulations in teacher preparation classrooms because in the real life classrooms, this is not possible. Furthermore, this may provide learning and training opportunities that can transfer to the real classroom and possibly improve teacher preparation.

Simulations have been used in fields outside education for decades. Flight simulators are probably the most commonly used and are an accepted practice for training future pilots. The medical field also uses simulations for training future doctors and nurses; however, they are not used typically in teacher education and there is a dearth of literature in this area.

2. Literature Review

Several studies have shown that virtual classrooms offer an environment for experiencing various student characteristics and learning about teaching approaches. Foley and McAllister (2005) found preservice teachers who utilized simSchool reported that the complex diversity of the simulated environment in terms of racial, cultural, and language needs of virtual students was a useful context for them to become more aware of those issues, to understand students' unique characteristics, and to plan for differentiated strategies. Compton, Davis, Graham and Swaharu (2008) reported similar results in a study of virtual field experiences where preservice teachers observed an exemplary virtual school teacher to learn about the special set of knowledge and skills necessary to teach (Hixon & So, 2009). However, more research is needed in this area.

3. Methods

The overall aim of this pilot study was to investigate ways in which traditional teaching of pre-service teacher candidates can be enhanced through the use of simulated learning environments. Candidate perceptions of simSchool were gathered through completing six reflections throughout the semester. Students completed their first reflection prior to using the simulated learning environment and then completed reflections after each of the four simulation completed and then completed a final reflection about the use of simulations in teacher preparation programs and their overall opinions of using the simulation. Data from twelve teacher candidates enrolled in an introduction to special education course were analyzed to determine perceptions toward simulated learning environments. All candidates were traditional undergraduates in their early twenties and they were completing degree requirements for licensure as elementary education teachers. The two credit introductory to special education course is required.

During the semester, candidates enrolled in simSchool (simschool.org) and completed four simulations throughout the semester. After each simulation, they were asked to reflect on the use of simulations in teacher preparation programs. Assignments were graded based on following directions for reflections (i.e. did they answer the questions posed) and for completion, but points are not quantitatively applied based on the content of their submissions. All candidates were required to complete these assignments as part of the coursework. Candidate surveys were also used to identify changes in candidate's perceptions of their own knowledge, skills, and dispositions toward teaching and learning, but due to the small nature of the sample they are not included in this article. A qualitative review of the reflections was conducted and will be discussed.

4. Discussion

All twelve candidates completed all six reflections assigned. Prior to beginning the first simulation, candidates were asked whether they had experience with the use of simulations and what were their initial thoughts about using a simulation in their coursework. Candidates reported using driving simulators and playing simulated video games previously. One candidate reported using SimSchool once, but no others reported using simulations. Most candidates stated that they were eager to try using the simulation although some apprehension was noted with technology knowledge and comfort with the use of technology. Half the candidate responded that they were excited and they thought it was a great idea. Other comments made by these candidates included "it might not be a perfect example of teaching in front of the classroom.....however, it think it will be good practice and will help with many aspects of teaching". Another candidate responded "it could be helpful for pre-service teachers who may not get as much time in the classroom as they would like". However, others seemed more reserved and stated "it sounds interesting, but also very strange"; or that they felt "intimidated", "timid" or "nervous" to try the simulation. Reported reactions did not correspond with perceived technological competencies or experience with video/simulations.

Throughout the semester, students reflected five additional times. Reflections occurred after completing each of the four required simulations and then a final reflection at the end of the semester. Throughout the course of the semester, candidates stated that the simulations were challenging, required them to think about the structure of the classroom, how to create and implement differentiated assignments, the importance of varying lessons in the classroom, and the importance of knowing your students. They also stated that the simulations assisted them with determining appropriate tasks (type and length) to provide to students. They also commented frequently on competing needs within the class and not being able to meet all students' needs simultaneously. This is especially interesting because the largest class assigned within the simulations given was five students.

After completing the four simulations, candidates were asked to reflect on what (if anything) they learned from this experience. Responses included, "I learned the pressure of time...you have a certain amount of time to do something and students get distracted". Another responded that he learned that "students who are given activities that are suitable to them will still have issues like not being on task...there is more to teaching than giving a lesson that is of interest to students". Others reported that they learned how to give clearer directions, more explicit directions, and to gauge students' responses to directions given. Finally, others commented on behavior management in the classroom and stated that they learned to always check on students or that they needed to provide proximity to make sure that they are working on the task at hand. However, when candidates were asked about the continued use of SimSchool, they resoundingly responded that they did not feel that it was a useful program and its use should not be continued.

5. Conclusion

This pilot study examined teacher candidate perceptions of using SimSchool in initial licensure coursework at one institute of higher education. Interesting, candidates did not think the simulation should be continued to be used in the teacher preparation program; however, their qualitative accounts of lessons learned showed a great deal of reflection. Furthermore, teacher candidates' reflections included common concerns expressed by beginning teachers such as meeting diverse academic and behavior needs in the classroom, planning and implementing differentiated instruction, and behavior management. Further study is needed to examine the use of simulated learning environments in teacher preparation programs.

References

- Compton, L., Davis, N., Graham, R. & Swaharu, P. (2008). Virtual Field Experience – Observing Virtual Teaching at a Distance: A Pilot Study. In K. McFerrin et al. (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2008* (pp. 285-288). Chesapeake, VA: Association for the Advancement of Computing in Education (AACE). Retrieved May 5, 2015 from <http://www.editlib.org/p/27174>.
- Cruikshank, D.R., Jenkins, D.B., & Metcalf, K.K. (2009). *The Art of Teaching* (5th ed.). McGraw Hill: New York, NY.
- Hixon, E., & So, H. (2009). Technology's role in field experiences for preservice teacher training. *Educational Technology & Society*, 12, 294-304.

SELF-EFFICACY, INTEREST, GOAL ACHIEVEMENT: HOW TO USE MOTIVATION IN CLASSROOM?

Julien Masson

Université Lyon 2, Laboratoire ECP (France)

Abstract

Motivation is a concept both found in the scientific literature and in everyday language and even more in school. Motivation is used to explain sometimes the success, sometimes the failure of the pupils.

It is rather complicated to define motivation. Fenouillet has counted at least 101 theories about this subject. We've picked out three of them. They particularly work in primary school :

- self-efficacy
- achievement goals
- interest

The purpose of the present research is to show in what extent pupils' performance can be related to their inner motivation.

Our study was first to develop psychometrically reliable measurement scales to apprehend self efficacy, achievement goals and interest for primary school pupils. After that, we measured their results to standardized tests in French and mathematics and calculated the correlations between these variables.

Our sample consisted of 427 pupils from french primary school of 10.5 years average.

The results are as follows:

- Self-efficacy (especially in French) positively impacts school achievement.
- Performance approach goal negatively impacts school achievement.
- Learning approach goal has no impact on school achievement.
- The two avoidance goals are not necessarily detrimental to academic achievement.
- Interest is affected both by achievement goals and self-efficacy, but has only a small impact on school achievement.

Keywords: *Motivation, self-efficacy, achievement goals, interest, primary school, school achievement.*

1. Motivation : a holy grail for pedagogues

The purpose of the present research is to show in what extent pupils' performance can be related to their inner motivation. It is rather complicated to define motivation. Fenouillet has counted at least 101 theories about this subject. We've picked out three of them. They particularly work in primary school :

- self efficacy
- achievement goals
- interest

2. Three motivation theories

Self efficacy (Bandura, 1997) :

It is the extent or strength of one's belief in one's own ability to complete tasks and reach goals. The author identifies four factors affecting self-efficacy.

1. Experience, or "Enactive Attainment": The experience of mastery is the most important factor determining a person's self-efficacy. Success raises self-efficacy, while failure lowers it.

2. Modelling, or "Vicarious Experience": When we see someone succeeding, our own self-efficacy increases; where we see people failing, our self-efficacy decreases. This process is most effectual when we see ourselves as similar to the model.

3. Social Persuasion: as encouragement or discouragement from another person.

4. Physiological Factors: like in stressful situations

Achievement goals (Elliot, 1999, Harackiewicz et Al., 2000)

When an individual has to solve a task, he will react in 4 different ways :

learning approach goal: based upon pleasure in achieving the goal in itself and improvement.

Performance approach goal: based upon trying to do better than the others and to make them realize it.

Learning avoidance goal: based upon avoiding useless learning, failure and becoming less efficient.

Performance avoidance goal: based upon avoiding feeling inferior or stupid compared to the others.

Interest (Schiefele, 1991)

«Interest» would both comprise the pleasure felt when achieving the task and the value we attribute to this task. Thus, «Interest» would be considered as a lasting choice one would make for a specific matter, activity, or knowledge according two components :

«feeling»

«giving value»

The «feeling» component refers to what we feel when working on a subject or activity we know already. It also refers to the feelings we associate with a new task or what it reminds us of.

The «giving value» component refers to the value we give to a task according to what it can provide (personal fulfilment, skills ...).

3. The study

Our study was first to develop psychometrically reliable measurement scales to apprehend self efficacy, achievement goals and interest for primary school pupils. After that we measured their results to standardized tests in French and mathematics and calculated the correlations between these variables.

Our sample consisted of 427 pupils from French primary school of 10.5 years average.

The results are as follows.

4. Results

Concerning self-efficacy, we can see that all correlations are significant and are between .18 and .38. Self efficacy and results in French and math are strongly linked. This link is even stronger than it seems transversal. Indeed, self-efficacy in French impacted the results in the same discipline but also in mathematics. It's the same for self-efficacy in mathematics which impacts the overall results. For achievement goals, we first found that the learning approach goal positively correlates the results both in math and French.

It seems also very negative to create a climate of competition in the class because the fact of pursuing a performance approach goal affects school results in both disciplines (negative correlations) and to confirm this, it appears that when students pursue an performance avoidance goal, that positively correlates results. Finally, learning avoidance goal correlates negatively with the results in both disciplines. Regarding the interest, there is a very surprising tendency since it would seem that interest have no connection with school performance. Interest in French is even negatively related with the results in math.

5. Conclusion

Among the three motivational concepts presented, self-efficacy seems particularly active in the class. So one should particularly act on its 4 drivers:

- allow the student to experience success
- establish a benevolent tutoring
- encourage, establish trust within the class

There is also evidence that feeling pleasure while learning is not enough to get good grades. It therefore cannot rely solely on any didactic background for passing the learning more fun way. Then another strong trend, the competition climate seem harmful in primary school. Anything that promotes the comparison between pair (ranking, public grading ...) is deleterious for student success.

Finally feeling an interest in a subject does not necessarily mean we succeed there, on the contrary.

References

- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Elliot, A.J. (1999)) Approach and avoidance motivation and achievement goals. *Educational Psychologist*, 34, 149-169
- Harackiewicz, J. M., Barron, K. E., Tauer, J. M., Carter, S. M., & Elliot, A. J. (2000). Short-term and long-term consequences of achievement goals: Predicting interest and performance over time. *Journal of Educational Psychology*, 92, 316–330
- Schiefele, U. (1991). Interest, learning, and motivation. *Educational Psychologist*, 26, 299- 323.

EFFECTIVENESS OF EARLY INTERVENTION FOR READING DEVELOPMENT IN STUDENTS WITH READING DISABILITIES

Renata Mousinho

Speech Therapy Department - Federal University of Rio de Janeiro (Brazil)

Abstract

The main objective of this study was to compare the results of speed reading (SR) versus reading comprehension (RC) at the beginning and end of the 2nd year of elementary school. The subjects were students with and without reading difficulties at both time points. During the study, 2 (two) students with reading disabilities attended workshops in language between the two evaluations. The central hypothesis is that the discrepancy initially presented can be minimized with early intervention.

The sample comprised 45 children from 2nd year of primary education, with a mean age of 7.58 (DV 3,793). Of this group, two students were assigned to the second analysis: a girl (CC1) and a boy (CC2) with reading disabilities. They attended weekly workshops aimed at developing oral language and phonological awareness.

The investigation was carried out in two stages: at the beginning and the end of the school year. The SR was measured by reading a narrative text (total time in seconds). To check for RC, five questions were asked (one point for each correct answer was given).

The results (t-test) showed significant growth in reading speed for the entire group for SR and for RC between the first assessment (A1) and the second assessment (A2). In A1 the SR was 315.53 seconds (SD 84.3), whereas in A2 it proved to be much faster at 219.17 seconds (SD 71.55), p value $< .000$. The average in RC of correct answers increased from 2.98 (SD 1.33) in A1 when compared to 3.49 (SD, 99) in A2 ($p < .027$).

Regarding the second analysis, comparing clinical cases with their classmates (z score), CC1 showed an improved SR when compared from A1 (SR of 1140/2, z 9.78) versus A2 (495 seconds, z 2.50). In addition, CC1's RC have improved from 1 (z -1.48) to 2 hits (z -1.50). For CC2 the results were similar with a A1 (SR 1020 seconds, z 8.35) versus an A2 (SR 240 seconds, z 0.29). RC improved from 1 (z -1.48) to 3 hits (z score 0.49).

The conclusion was the workshops promoted faster development and minimized the gap in both SR and RC when compared with other colleagues, favoring success in reading skills

The research project was approved by the Research and Ethics Committee of the Deolindo Couto Neurology Institute (Federal University of Rio de Janeiro).

Keywords: *Reading, comprehension, reading disabilities, early intervention*

1. Introduction

Reading problems can impact scholar development, bringing emotional and social repercussions. Vloedgraven & Verhoeven (2007) draw attention to the fact that, in recent decades, researchers, educators and politicians have been paying more attention to these issues, since many studies show the positive impact of early intervention programs in reading disabilities (National Institute of Child Health and Human Development, 2000).

The main objective of this study was to compare the results of speed reading (SR) versus reading comprehension (RC) at the beginning and at the end of the 2nd year of elementary school between children with and without reading disabilities. The central hypothesis is that the discrepancy initially presented can be minimized with early intervention in Brazilian Portuguese, as observed in other languages.

2. Methods

The sample comprised 45 children from the 2nd year of primary education, with a mean age of 7.58 (DV 3,793). Two students from this group were assigned to the second analysis: a girl (CC1) and a boy (CC2) with reading disabilities. She has the diagnosis hypothesis of Dyslexia, and the boy is a poor reader. They attended weekly workshops aimed at developing oral language and phonological awareness.

As oral text reading seems to be a valuable tool in measuring reading skills in elementary school (Roehrig et al., 2008), and has high correlation with reading comprehension (Petscher & Kim, 2011; Roberts, Good, & Corcoran, 2005), it was chosen as a tool for this paper.

The SR was measured by reading a narrative text (total time in seconds). To check for RC, five questions were asked (one point for each correct answer was given). The investigation was carried out in two stages: at the beginning and the end of the school year.

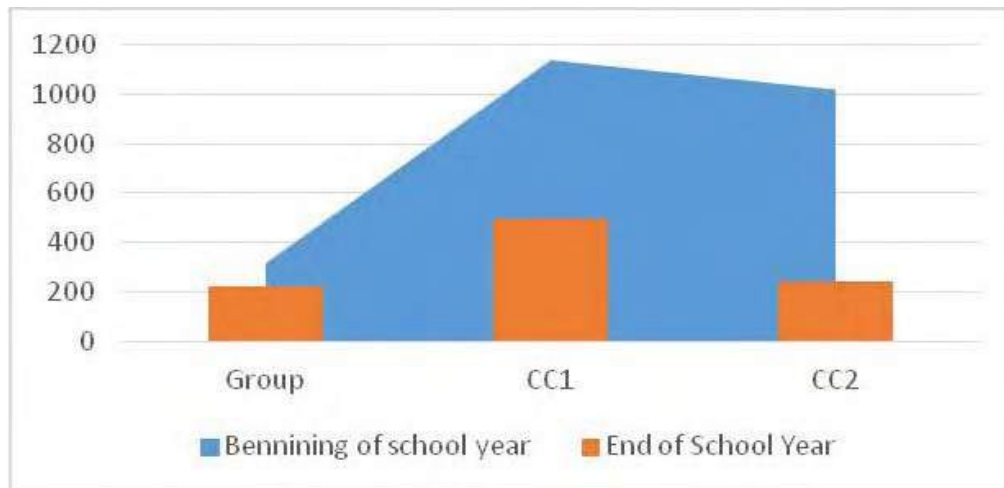
The research project was approved by the Research and Ethics Committee of the Deolindo Couto Neurology Institute (Federal University of Rio de Janeiro).

3. Results

The results (t-test) showed significant growth in reading speed for the entire group for SR and for RC between the first assessment (A1 – beginning of school year) and the second assessment (A2 – end of school year). In A1 the SR was 315.53 seconds (SD 84.3), whereas in A2 it proved to be much faster at 219.17 seconds (SD 71.55), p value $< .000$. The average of correct answers in RC increased from 2.98 (SD 1.33) in A1 when compared to 3.49 (SD .99) in A2 ($p < .027$).

Regarding the second analysis, comparing clinical cases with their classmates (z score), CC1 showed an improved SR when compared from A1 (SR of 1140/2, z 9.78) versus A2 (495 seconds, z 2.50). In addition, CC1's RC have improved from 1 (z -1.48) to 2 hits (z -1.50). For CC2 the results were similar with a A1 (SR 1020 seconds, z 8.35) versus an A2 (SR 240 seconds, z 0.29). RC improved from 1 (z -1.48) to 3 hits (z score 0.49).

Figure 1. Comparison of speed reading between group and scholars with reading disabilities at the beginning and the end of school year



As shown in Figure 1, all scholars showed improvement in reading speed, despite of their initial condition. As reading speed is measured in total textual reading time, a smaller number of seconds means a better result. The poor reader has almost reached the average of the group. While the dyslexic child, despite improvement, still showed a distance from the classmates results.

Figure 2. Comparison of reading comprehension between group and scholars with reading disabilities at the beginning and the end of school year

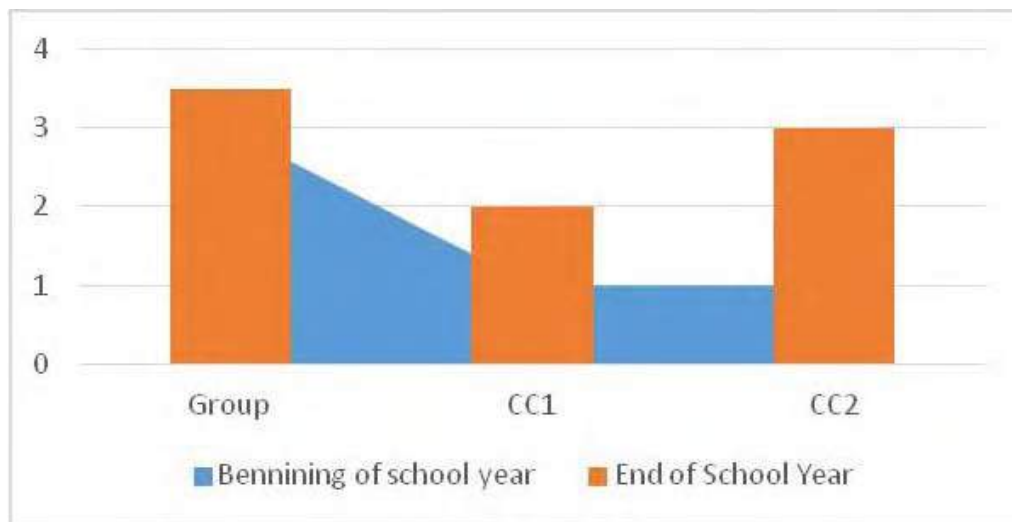


Figure 2 shows the development of comprehension skills in second grade. Both the group and children with reading disabilities have improved the results, although the girl with Dyslexia presented a more discreet improvement.

The results show that in alphabetic transparent languages such as Brazilian Portuguese, development intervention based on oral language and phonological awareness are as effective as in alphabetic opaque languages as English.

4. Conclusions

The conclusion was the workshops promoted faster development and minimized the gap in both SR and RC when compared with other colleagues, favoring success in reading skills in Brazilian Portuguese. Despite the visible growth, more intervention time should be required, especially with the scholar with Dyslexia.

References

- National Institute of Child Health and Human Development (2000). Report of the National Reading Panel. *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction* (NIH publication no. 00.4769). Washington, DC: US Government Printing Office.
- Petscher Y, Kim YS. (2011). The utility e accuracy of oral reading fluency score types in predicting reading comprehension. *Journal of School Psychology*, v.49 p.107–129.
- Roberts, G, Good, R. & Corcoran, S. (2005). Story Retell: A Fluency-Based Indicator of Reading Comprehension *School Psychology Quarterly*; Fall 2005; 20, 3; *Education Periodicals*. pg. 304
- Roehrig, A.D., Petscher, Y., Nettles, S. M., Hudson, R. F., & Torgesen, J. K. (2008). Accuracy of the DIBELS oral reading fluency measure for predicting third grade reading comprehension outcomes, *Journal of School Psychology*, 46, 343–366.
- Vloedgraven, J. & Verhoeven, L. (2007) *Screening of phonological awareness in the early elementary grades: an IRT approach*. *Dyslexia*, 57:33-50.

BIOLOGY INCLUSIVE EDUCATION IN SECONDARY EDUCATION: BUILDING AN EDUCATION FOR ALL

Sergio E. C. P. Silva¹, Simone J. R. Maciel¹ & Marcia R. Pereira^{1,2}

¹*Departamento de Biologia e Ciências, Colégio Pedro II/ (Brasil)*

²*CAPUERJ, UERJ/Professora Assistente (Brasil)*

Abstract

The growing movement of inclusion, based on the composition of inclusive classrooms, in a school for all, in which disabled young students share the space of teaching and learning with non-disabled ones is an ongoing process, which has been relying on international documents, such as Salamanca Statement (UNESCO, 1994), and national, as the document National Policy on Special Education in the Perspective of Inclusive Education (BRASIL, 2007). This paper deals with experiences in Biology's inclusive education for visually disabled students in regular classes in a public high school Colégio Pedro II, Campus São Cristóvão III, Rio de Janeiro, Brazil. The issues studied were classical genetics and systemic circulation. The construction of materials was performed as 3D models, diagrams, graphs, and other figures made from tactile writing Braille with help of free software Monet, Easy Braille, also free software, as well as drawings and diagrams embossed paper, made with rubber basis support, Cuisenaire used in teaching classical genetics, adaptation of assessment tools for reading with Dosvox software and after school care, to support the specific needs of disabled students, reducing communication barriers and access to information. It was possible to see improvement in results of participation and involvement in the education process of regular classes, and obtain higher grades in formal assessments conducted at the school. By also benefit the other students, the teaching strategies applied in inclusive classrooms provide from the perception of the benefits for everyone involved in the process, visually impaired and normally sighted students and teachers.

Keywords: *Visual disabilities, biological education, inclusive education, universal design*

1. Introduction

The inclusion of disabled people in educational institutions is the result of a historical process that gets great relevance in the scenario of global education nowadays. It is important to understand their relationship with the history of special education. The ideal of inclusive school, proposed by Semenghini (1998), argues that students with special educational needs can be developed along with the other students. For this, the school has to adapt to the specific characteristics and needs of their students, providing the conditions for the development of their individual potential, in order to obtain academic success for all, which is one of the fundamental challenges of inclusion. According to Vaz (2012) for the learning process, it is essential the use and the development of tools and resources to assist in the acquisition of concepts. In the classroom, teaching materials may favor or not the acquisition of knowledge, and for the visually impaired person, these materials require an adjustment to your perceptual framework, that is, in most cases, unknown, in its peculiarities by the sighted people.

The touch can help the visually impaired individual in the formation of concepts and mental images of the things he does not see as well as in the development of their creativity and aesthetic sense. According to Burton (2003, p. 4005), "Brain imaging studies describe visual cortex activity in blind people During non-visual tasks such as Braille reading, hearing words, or sensory discriminations of tactile or auditory stimuli (...)", which shows that the loss of vision does not require inactivation of the visual cortex, and areas that shows activity in sighted people to read or hear a word are also stimulated in blind people reading in Braille. In blind people, the tactile perception is very important for the perception of the world with your hands. Has different meaning from possible by the vision, for the mental images when formed through tactile perceptions allow us to recognize the object from the identification of its features as its texture, shape, size, temperature etc. (CARDINALI & FERREIRA, 2010).

Thus, contact with concrete teaching material in the study of biology is shown as a path to a meaningful learning of this discipline, as well as all the others, especially those that require prints analysis, charts and other resources that require essentially vision. This aid is valuable not only for the visually impaired students, but also for sighted students, since the image reading also requires learning (DIMOPOULOS et al, 2003; SINHA, 2013). In this context, the accessibility of same materials for all is a basic assumption of universal design applied in the teaching-learning process. Universal design was defined by the Center for Universal Design (1997) as "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design." According to Meyer & O'Neill (2000), the use of universal design provides a way to establish the optimal conditions for learning of all students. The goal is not to standardize education, but to provide opportunities for each one to develop the most of your expectations in line with its features.

Following these premises, this work illustrates the use of different tactile teaching materials as a strategy for teaching not only visually impaired students, as all students present in the classroom.

2. Methods

The research is characterized as a qualitative investigation of the use of several regular classroom resources and specialized education in the Colégio Pedro II, Campus São Cristóvão III, Rio de Janeiro, a Brazilian Federal Public School. The subjects are ten high school students, aged between 16 and 18 years old, six of the 3rd year, two blind students with low vision and three sighted students, and four students of the 2nd year, one blind, one with low vision and three sighted students. Students with special needs attend in opposite shift, the Multifunction Resource Room (SRM) from the Center for Support to People with Special Needs (NAPNE), to weekly meetings with specialist teachers. The criterion for defining the composition of the sample took into account the grade and curriculum. Students were told that this research and its results would not be used for your school evaluation. They were also informed of the contents and the methodology used and informed about the objectives of the work, and signed the Informed Consent Statement.

Table 1. Teaching Materials and expected benefits

Teaching Materials Adapted	Use	Expected benefits
Rubber plate, 120g A4 paper and ballpoint pen	The board is the basis for the teacher to write, in reverse, so that the letters or traces remain embossed on the back of the sheet, allowing the tactile identification of the figure / scheme.	Low cost and practicality. The same schemes made for sighted students can be done during class without the need to be prepared beforehand.
Electrical wire and pliers	models of molding such as chromosomes and chromatin.	Low cost and easy handling. Allows the identification of the two states morphophysiological the genetic material and the different degrees of compression on a chromatin filament.
Biscuit, ink, brushes and newspapers	construction of biological models.	Low cost and durability. Enables handling and tactile and visual identification of the indicated structures.
Software Monet and Braille Fácil	Production brailizad captioned images.	Free software that enables the production of images and <i>brailizaded</i> schemes, with their captions. The material may be reproduced in Braille printer for catalog composition and handouts to the student's personal use. Enables the student to follow the regular class in class and that has its own illustrated reference material tactile way.
EVA plastic, colored glue	Construction of Punnett squares	Low cost and easy to handle. Provides easy identification of genetic crosses 1st and 2nd Mendel's laws.
Cuisenaire rods	Use blocks with different colors and sizes to represent dominant and recessive alleles at an intersection.	Low cost. Allows concrete experiences on abstract concepts in order to lead, gradually increasing abstractions.

The Biology class about Mendelian genetics initially gave in the regular classroom and used, along explanations designs in high relief and modeling the structure of chromosomes in electrical wires and the EVA plates with some characteristic crossings 1st law of Mendel. In a second step, the visually impaired students participated in the Educational Service Specializing where they could have a second contact, using different dynamics, with the same concepts worked previously.

Initially the concept of alleles has been increased with the use of Cuisenaire material with different shapes and sizes, the smaller blocks being chosen to represent the greatest and recessive alleles for dominant. In dynamic with this same material the students solved some problems proposed genetic cross. Then we used a Punnett square *brailized* so they could, using the Perkins machine, complete autonomously crossings exercises. A booklet with text and *brailized* images were provided students with the main topics developed.

The class on the circulatory system also was in the regular classroom, and used three-dimensional models of the heart made with biscuit, *brailized* schemes for the identification of blood circuits and a handout with the main topics studied. Subsequently, the visually impaired students might have contact again with the same materials in the resource room, and thus widely discussed on the subject, answering questions and expanding their knowledge.

3. Discussion and Conclusion

The testimony of blind and sighted students as well as better grades obtained in formal assessments required by the college indicated that the strategies applied were favorable to the learning set of research participant students.

The use of adapted teaching resources for blind and low vision individuals proved critical to the construction of knowledge and development of concepts, since the use of a relevant good quality teaching materials facilitates the understanding of the subject studied, not only in the case of students with visual impairment as well as to the sighted students that have their learning considered dependent of the visual component increasing the chances of learning for all.

Thus, the classrooms can become communities of mutual support if teachers promote respect for differences and provide diverse opportunities for students to see themselves to each other in many ways (STAINBACK & STAINBACK, 1999, p. 299). The construction of a democratic society formed by critics and socially active citizens is vital so inclusion of students with special needs is made in a wide and concrete way in parallel to increase in individual autonomy in educational process.

References

- Brasil. Lei 9394 de 20 de dezembro de 1996. *Lei de Diretrizes e Bases*. Disponível em: <<http://www.dgrh.unicamp.br/formularios/ldb.pdf>> Acesso em: 12 dez. 2007.
- Burton, H. Visual Cortex Activity in Early and Late Blind People. *The Journal of Neuroscience*, 2003. v. 23, (10), p.4005–4011.
- Cardinali, S. M. M.; Ferreira, A. C. A aprendizagem da célula pelos estudantes cegos utilizando modelos tridimensionais: um desafio ético. *Revista Benjamin Constant*, edição 46, agosto de 2010.
- Center for Universal Design. About universal design. Raleigh, NC: North Carolina State University. Retrieved December 9, 2009 from http://www.design.ncsu.edu/cud/about_ud/about_ud.htm
- Dimopoulos, K.; Koulaidis, V. & Sklaveniti, S. Towards an Analysis of Visual Images in School Science Textbooks and Press Articles about Science and Technology. *Research in Science Education*, 2003, 33 (2), p. 189–216.
- Meyer, A. & O'Neill, L. Beyond access: Universal design for learning. *Exceptional Parent*, 2000, 30 (3), p. 59-61.
- Semenghini, I. A escola inclusiva investe nas potencialidades do aluno: tópicos para a reflexão com a comunidade. In: Baumel, R.C.R.C.; Semenghini, I. *Integrar/incluir: desafio para a escola atual*. São Paulo: FEUSP, 1998. p. 13-44.
- Sinha, P. Cegos que agora enxergam. *Scientific American Brasil*. Ano XI, 2013, (135), p. 46-53.
- Stainback, Susan; Stainback, Willian. Inclusão: um guia para educadores. Trad. Magda França Lopes. Porto Alegre: Artes Médicas, 1999.
- UNESCO. Declaração de Salamanca e linha de ação sobre necessidades educativas especiais. Genebra: [s.n.], 1994. VAZ, J. M. C. Material Didático para Ensino de Biologia: Possibilidades de Inclusão (Didactic Material for Biology Education: Inclusion Possibilities). Universidade Federal de Alfenas (UNIFAL-MG). *Revista Brasileira de Pesquisa em Educação em Ciências*. Vol. 12, No3, 2012. p. 81-104.

TRANSPORT SIMULATION FOR EDUCATIONAL PURPOSE

Alexandra Haller & Lisa-Maria Putz

Logistikum – Transport Logistics & Mobility, University of Applied Sciences Upper Austria (Austria)

Abstract

Research indicates that using simulation games is one valuable approach to teach people on complex processes such as transport chains. Aim of the paper is to describe the construction and testing process of a didactically valuable simulation game to teach people without or with less prior knowledge on complex multimodal transport processes. Prior to the construction a literature review on suitable teaching methods as well as two expert interviews were conducted.

Keywords: *Simulation game, logistics education, LEGO-mindstorms, game-based learning, ICT*

1. Introduction & Aim

Compared to railway and road transport inland vessels have a higher transport capacity, cause less costs in regard of emissions, climate gases, accidents as well as infrastructure and maintaining. With a view on energy use, inland vessels are very economic – they are able to transport one ton of cargo nearly four times wider than a truck consuming the same amount of energy (Dolinsek et al, 2013).

Nonetheless, inland vessels are only used for about 6.5 % of European freight transport. European motorways are already congested and more than 75 % of goods within Europe were carried out by truck (Eurostat, 2014). Thus, it is essential to foster the integration of alternative and environmentally friendly transport modes into the logistics transport chain to meet the requirements for a sustainable future (European Commission, 2011).

Planning multimodal (using two or more different transport modes) transport with inland vessels or trains is a complex process since various different actors are involved and have to be coordinated and the transshipment must be organized (Dolinsek et al, 2013). Thus, it is of utmost importance to have extensive logistical knowledge. The better the logistic planning in advance is, the more cost and time can be saved and multimodal transport can be an economic alternative to classical truck transport (Posset et al, 2014). To be able to plan efficient multimodal transport it is important to start the knowledge gaining process already within logistics education (OECD, 2004).

Aim of the paper is to describe the construction and testing process of a didactically valuable simulation game to teach people without or with less prior knowledge on complex multimodal transport processes.

2. Methodology & Results

To find out about appropriate pedagogical approaches to best teach students on multimodal transport processes a literature review on suitable teaching methods as well as two expert interviews were conducted.

Research suggests that within logistics education active learning methods were widely used to teach students on logistics processes. To understand complex transport processes it is essential to display all steps required within multimodal transport and to create an overall representation of the transport chain. Hence, people get a combined understanding of multimodal transport processes in its entirety and of the importance of interaction between all actors involved (Sparling, 2002). One method is to visualize the transport chain using a simulation game. Thereby students learn in a playful way the different steps required within a transport chain and how important it is to interact with each other (Nkhoma, Calbeto, Sriratanaviriyakul, Muang, Tran, Cao 2014) (Lincoln, Reiners, 2012). Based on that outcome it was decided to develop a simulation game on multimodal transport processes.

Research suggests that one main aspect when constructing a simulation game is to develop a simplified not to complex simulation game concept. Thereby it is essential to demonstrate transport processes as intelligible as possible since the majority of students as main target group has no or only little prior knowledge on the topic (Tan, James Noble, 2007).

To illustrate these transport chains we decided to simulate a multimodal transport at a minimized representation of a terminal using models of involved actors: a truck, a train and an inland vessel as different transport modes and a crane as well as a reach stacker as transshipment equipment. Therefore the suitable material to construct these models had to be found.

Desktop research indicates that due to its variety of advantages LEGO can be qualified as suitable material since it is easy to program, a wide range of prefabricated LEGO-mindstorms is available and the broad mass of people is familiar with LEGO (Santos, Gohr, Vieira Junior, 2012).

Based on the results a formation plan was developed and implemented which foresees to simulate multimodal transport processes at a minimized representation of a terminal, by using different LEGO-mindstorm models. Tablets were used to steer the models.

3. Practical Implementation and Simulation Game Description

The simulation game is available at the port of Enns. Students, teachers and lecturers from schools and universities can play the simulation game free of charge and optionally combine the simulation game with a practical visit of the port as trimodal hub. Goal of this approach is to support educational institutions to integrate multimodal transport into logistics education.

The simulation game is structured into three main parts. Within part one students were divided into five teams. They get a playing instruction and their tasks within the game. Thereby every team receives a different role. The students have to plan the truck, the train or the vessel transport or are responsible for the transshipment via reach stacker or truck. Before the game starts, they are instructed how to operate the mindstorm models and get a short theoretical introduction on multimodal transport – in concrete an introduction video is show to them via tablets.

In a second step they have about 15 minutes to pre-discuss their group specific task as well as to interact with other groups to theoretically plan the transport before the simulation game starts. Afterwards the students have to simulate their prior discussed transport solution on the minimized representation of the terminal by operating their LEGO-mindstorm models.

Figure 1. Minimized representation of a terminal with the five LEGO-mindstorm models and tablets to operate them.



After finishing the simulation they have to discuss potential mistakes made and evaluate their transshipment simulation together. Since the whole workshop takes place at the Port of Enns their optimized simulation version additionally can be compared with the “real-life-container-handling” at the port of Enns. As last step, to test their prior gained knowledge the participants have to solve a multiple-choice quiz at the tablets.

4. Pilot and Evaluation

The simulation game was first tested and evaluated by students, teachers, lecturers and other important stakeholders within two pilot workshops in October 2014. The simulation game was thereby integrated into a one day workshop on inland navigation and multimodal transport consisting of theoretical lectures, group work activities as well as the simulation game and a port visit. After the first

workshop was finished a feedback form was handed over to the participating students. 15 questionnaires were completed and returned. The received feedback will help to further develop and improve the simulation game.

The relevant questions concerning the simulation game were answered as follows:

1. *What about the workshop (theoretical lecture, group work activity, port visit, simulation game) do you remember most and what did you like best?* - 80 % of students named the LEGO-simulator.

2. *How did you like the usage of the LEGO-simulator to generate knowledge?* - Feedback again was 100 % positive since students classified the simulator as very understandable and descriptively.

5. Conclusion

Students actively participated at the simulation game. They showed strong interest on the LEGO transshipment simulator and worked out a carefully chosen transport solution. The combination of theoretical, interactive as well as practical elements brought variety into the knowledge gaining process and students especially liked to independently work out solutions in a team. The playful aspect of the LEGO transshipment simulation additionally encouraged them to actively participate.

As a next step it is planned to develop a second, more complex version of the simulation game to address people with previous knowledge on the topic such as stakeholders from the industry or advanced students with a focus on logistics.

References

- Dolinsek et al. (2013). *Manual on Danube Navigation*. Vienna: via donau.
- Eurostat. (2014). *Modal split of freight transport*. Retrieved January 12, 2015, <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tsdtr220&plugin=1>
- European Union. (2011). *White Paper 'Roadmap to a single European transport area — Towards a competitive and resource-efficient transport system'* (COM (2011) 144 final of 28 March 2011). Luxembourg: Publications Office of the European Union.
- Posset, M; Gierlinger, D; Gronalt, M; Peherstorfer, H; Pripfl, H; Starkl, F. (2014). *Intermodaler Verkehr Europa*, Vienna: FH OÖ Forschungs- und Entwicklungs GmbH – Logistikum Steyr.
- OECD. (2004). *Communicating Environmentally Sustainable Transport. The Role of Soft Measures*. France: OECD publications.
- Sparling, D. (2002). Simulations and supply chains: Strategies for teaching supply chain management. *Supply Chain Management: An International Journal*, Vol. 7 (Issue 5), 334 – 342.
- Nkhoma, M; Calbeto, J; Sriratanaviriyakul, N; Muang, T; Tran, Q. H., Cao; T. K. (2014). Towards an understanding of real-time continuous feedback from simulation games. *Interactive Technology and Smart Education*, Vol. 11 (Issue: 1), 45 – 62.
- Wood L. C.; Reiners, T. (2012). Gamification in logistics and supply chain education: Extending active learning. In P. Kommers, T. Iss, P. Isaias (Eds.) (2012), *IADIS International Conference on Internet Technologies & Society*, 101-108.
- Tan, K. H.; James Noble, J. (2007). Plug and play (PnP) modelling approach to throughput analysis. *Journal of Manufacturing Technology Management*, Vol. 18 (Issue: 7), 807 – 817.
- Santos, L. C; Gohr, C. F; Vieira Junior, M. (2012). Simulation of assembly operations using interchangeable parts for OM education: A hands-on activity with water pipe fittings. *International Journal of Operations & Production Management*, Vol. 32 (Issue: 12), 1427 – 1440.

THE FAMILY INFLUENCE ON READING COMPREHENSION IN CHILDREN WITH DYSLLEXIA

Nayana Pires da Silva Rodrigues, Raquel Rosa Mendonça & Renata Mousinho

Federal University of Rio de Janeiro – UFRJ (Brazil)

Abstract

Introduction: children acquire language abilities through interaction, and one of these abilities is to learn written language. During this process, however, the individual may suffer some difficulties, which can be considered normal or may be classified as a type of learning disorder when persistent. Dyslexia (Specific Reading Disorder) has neurobiological origins and is considered one of the Specific Learning Disorders. **Objectives:** This paper aims to investigate the relationship between the level of parental education and the reading level of their children with Dyslexia. **Methods:** The following exclusion criteria were used: children with cognitive impairment, attentional difficulties, executive dysfunction, and behavior or oral language disorders. As inclusion criteria, the student should have Dyslexia diagnosed by an interdisciplinary team. In this context, the sample was comprised of 29 students, 20 boys and 9 girls. The age ranged from 6 to 14 years, with a mean age of 9.4 years and a standard deviation of 2.34. Research variables were gender, grade, school type (private, municipal and federal schools), age, reading fluency, reading comprehension, mother's education and father's education. These data were collected from case histories, speech and language therapy evaluations and other documents contained in the records. The research project was approved by the Research and Ethics Committee of the Deolindo Couto Neurobiology Institute (Federal University of Rio de Janeiro). **Results:** Pearson's correlation test (SPSS 16.0) was used to correlate the variables. Significant positive correlations were detected between reading comprehension and school grade (0.405*) and reading comprehension and mother's education (0.406 *). Significant negative correlations were obtained between reading comprehension and types of school (-0.433 *). High significant correlations, all positive, were as follows: age and reading comprehension (0.693 **), age and reading fluency (0.765 **), types of school and mother's education (0.491 **), father's education and types of school (0.517 **), reading comprehension and reading fluency (0.594 **) and father's education and mother's education (0.691 **). **Conclusions:** The educational level of the parents, especially of the mother, regardless of their professional training, is directly related to reading comprehension of children with Dyslexia.

Keywords: *Reading; Family; Learning; Dyslexia; Reading Comprehension.*

1. Introduction

Children acquire language abilities through interaction, and one of these abilities is to learn written language. During this process, however, the individual may suffer some difficulties, which can be considered normal or may be classified as a type of learning disorder when persistent. Dyslexia is a specific reading disorder characterized by a malfunction of the central nervous system alone, thereby further compromises as sensory or motor disorders, mental retardation, and even psychosocial problems must be excluded for an individual to be diagnosed as dyslexic (Lima, Salgado and Ciasca, 2009).

However, the variables involved in the development of reading are many, and the family role in this process has been studied. A Brazilian study (Menezes-Filho, 2008), conducted an econometric survey based on data from the Basic Education Assessment System (SAEB, 2003), showed that student educational development is influenced by factors such as parental education, access to books or content that expand the individual's knowledge of world, computer at home, and the absence of parents for reasons of work or loss. In this context, it may be assumed that students with reading deficits also suffer this interference. This paper aims to investigate the relationship between the level of parental education and the reading level of their children with Dyslexia.

2. Methods

The following exclusion criteria used were: children with cognitive impairment, attentional difficulties, executive dysfunction, and behavior or oral language disorders. As inclusion criteria, the student should have Dyslexia assigned by an interdisciplinary team. In this context, the sample was comprised of 29 students, 20 boys and 9 girls. The age ranged from 6 to 14 years, with a mean age of 9.4 years and a standard deviation of 2.34. Research variables were gender, grade level, school type (private, municipal and federal schools), age, reading fluency, reading comprehension, mother's education and father's education. These data were collected from case histories, speech and language therapy evaluations and other documents contained in the records. The research project was approved by the Research and Ethics Committee of the Deolindo Couto Neurobiology Institute (Federal University of Rio de Janeiro) under number 009/2010.

In order to verify the influence of parental education on reading performance of children with Dyslexia, the correlation between these data obtained from records and the result of reading evaluations of patients (speed and comprehension) was calculated. Pearson's correlation test was used. To be considered as a significant correlation, the correlation significance value should be less than 0.05 and to be rated as a highly significant correlation value should be less than 0.01.

To obtain the values for the reading speed and comprehension level, the following instruments were used: reading fluency was calculated by the number of words read per minute in an appropriate text for each grade; reading comprehension was verified by five questions for each text, being assigned 20% score for each question answered correctly.

3. Results / Discussion

Pearson's correlation test (SPSS 16.0) was used to correlate the variables. Significant positive correlations were detected between reading comprehension and grade and between reading comprehension and mother's education. Significant negative correlations were found between reading comprehension and types of school. High significant correlations, all positive, were as follows: age and reading comprehension, age and reading fluency, types of schools and mother's education, father's education and types of schools, reading comprehension and reading fluency and father's education and mother's education.

Table 1. Pearson's correlation coefficients between variables gender, age, type of school, grade, comprehension level, reading speed and education of father and mother of children in the study.

	Gender	age	School type	Grade	Comprehension Level	Reading fluency	Mother's education	Father's education
Gender	1	,136	,115	-,204	-,27	,071	,020	,067
Age			-,287	,136	,693**	,765**	,183	,061
School type				-,167	-,433*	-,216	-,491**	-,517**
Grade					,405*	,307	,086	-0,022
Comprehension level						,594 **	,406*	,230
Reading fluency							,025	-,016
Mother's education								,691**
Father's education								1

The relationship between the education levels of father and mother was significant. This can be attributed to several factors. There are studies that show that a marital relationship is more satisfying if the couple have the same level of education (Scorsolini-Comin and Santos, 2010; Sardinha, Falcone and Ferreira, 2009). Some studies even suggest that unsatisfactory marriages negatively influence the academic development of children (Gottman, 1998). As we have seen in the results of the current study, the type of school chosen by parents for enrolling their children can be influenced by the level of education of the parents and the number of stimuli for reading at home. There are families who have easier to access specialized information regarding the education of their children (Simionato - Tozo and Biasoli - Alves, 1998), such as books, magazines and internet. These instruments help composing a stimulating environment for reading and writing learning.

4. Conclusions

Despite Dyslexia being considered a neurobiological disorder without a specific causal element, its manifestations suffer direct influence of several components, such as genetic (presence of a relative with the disorder) and external factors as the type of school, parents' education and age. The educational level of the parents, especially of the mother, regardless of their professional training, is directly related to reading comprehension of children with Dyslexia.

Further studies are needed as most of the previous investigations have focused on existing genetic relationship between dyslexic individuals and their family and not in an environmental relationship. As shown in the current study, it interferes with the learning of children with dyslexia and likely those who do not exhibit the learning disorders.

References

- Gottman, J. M. Psychology and the study of marital processes. *Annual Review of Psychology*, California, v.49, n.1, p. 169-197, 1998.
- Lima, R.F.; Salgado, C.A.; Ciasca, S. Atualidades na Dislexia do desenvolvimento. *Revista Psique*, São Paulo, v.38, p. 22-29, 2009.
- Menezes-Filho, N. Os determinantes do desempenho escolar do Brasil. Disponível em: <<http://www.todospelaeducacao.org.br/biblioteca/1091/os-determinantes-do-desempenho-escolar-do-brasil/>>. Acesso em: 15 jun. 2014.
- Sardinha, A.; Falcone, E.M.O.; Ferreira, M.C. As relações entre satisfação conjugal e as habilidades sociais percebidas no cônjuge. *Psicologia: teoria e pesquisa*, Brasília, v.25, n.3, p. 395-402, jul./set. 2009.
- Scorsolini-Comin, F.; Santos, M.A. Satisfação Conjugal: Revisão Integrativa da Literatura Científica Nacional. *Psicologia: Reflexão e Crítica*, Porto Alegre, v.26, n.3, p.525-531, 2010.
- Simionato-Tozo, S. M. P.; Biasoli-Alves, Z. M. M. O cotidiano e as relações familiares em duas gerações. *Paidéia: Cadernos de Psicologia e Educação*, Ribeirão Preto, v.8, n.14, p. 137-150, fev./ago.1998.

THE EFFECT OF THE THEME CENTERED INTERACTION ON THE TEACHERS' AND ON THE STUDENTS' WORK

Rita Sápiné Bényei

University of Debrecen, Pedagogy PhD student (Hungary)

Abstract

The Theme Centered Interaction (TCI, Chon, 1975), which is a concept for personal development and working with groups, is hardly known in the Hungarian education system. There is no publication available in connection with this approach in Hungarian. According to the principles of TCI, in the group-based teaching/learning process a close connection is detectable between students and teachers. The teachers recognize the needs of their students, know their skills and abilities, and a positive effect is traceable in the development of these skills and abilities due to the interaction between the group members. TCI is recognized in the system of different learning-teaching processes as a method highly supporting cooperative school work. The international literature on the subject finds TCI effective and efficient in the following areas: leadership training, psychology, volunteer work, mental trainings. Beyond these major fields of interest TCI is in close connection with education. Researches focus on personal experiences and quantitative measures to find ways for adapting the rather German and Swiss connected TCI into the Hungarian education system. Our researches try to answer the question what is the advantages and achievement of introducing this method into our teachers' methods. We have found that in the productive learning process, in both under- and post graduate teacher education, the method is quit promising, and such as would improve the teachers' skills and abilities for developing their own learning and teaching methods and their affinity towards group work.

Keywords: *Teaching methods, motivation, cooperation, development, theme-centered interaction*

References

Chon, R. (1975) *Von der Psychoanalyse zur themenzentrierten Interaktion. Von der Behandlung einzelner zu einer pedagogik für alle.* Stuttgart, Klett-Cotta

CASE STUDY OF A SCHOLAR WITH DYSLEXIA: THE ROLE OF INCLUSIVE EDUCATION AND RTI PROGRAM

Maria Clara Holanda, Carolina Sathler & Renata Mousinho

Federal University of Rio de Janeiro (Brazil)

Abstract

This study shows the importance of a good school, associated intervention and environmental contribution, to the development of a student with Dyslexia. It consists in a case study of an eight-year-old male whose diagnosis was assigned by an interdisciplinary team. He was evaluated at three stages: first, when diagnosed, a semester later, and a year after the first evaluation. After diagnosis, he moved to a school considered of better quality and started participating in workshops in the areas of pedagogy and Speech-Language Pathology. In order to measure the gains at each evaluation, reading speed and results in phonological awareness tasks were selected as variables. The results corroborate the role of school and the environmental factors that influence the learning process.

Keywords: *Dyslexia, Education, Stimulation, Reading e Phonology*

1. Introduction

Inclusive education is a form of individualized focus in individuals with a specific need. In the educational context, Dyslexia is one the most common learning disabilities. Dyslexia is a specific reading disorder of biological nature that is occasioned by failure or abnormality in brain networks that connect anterior to the most posterior regions of the cerebral cortex. The temporal skills are the most affected skills and difficulties with working memory, lexical access and phonological awareness are evident in these individuals, damaging the fluency, accuracy, and comprehension of what was read. (MOUSINHO, R .:)

However, in addition to biological factors, it is known that environmental factors are directly related to learning and can help or worsen the prognosis. A school that provides an inclusive teaching method, with adjustments in their curriculum and support to the family is crucial for these children (CIASCA, 2004).

In addition to the participation of an interdisciplinary team, other options such as the RTI have been raised for an accurate diagnosis of Dyslexia (CAPELLINI, 2009). The RTI is a model of program for early identification aimed at elementary school children with learning and behavioral difficulties in need of more specific interventions (COOPER, ROBSON, KIGER, 2009). The benefits of RTI include efficiency and effectiveness in reducing academic difficulties such as reading, writing and mathematics; decreased low education identified as cause of poor performance; decreased misinterpretation of students referred for special services (FUCHS, FUCHS, 2007).

2. Methods

This consisted on a case study of a male, eight-year-old student of the interdisciplinary project ELO-UFRJ (A.M.S.). In 2010, he left a municipal school and enrolled in federal one (with a reference in teaching quality in Rio de Janeiro). He was in the middle of the 3rd grade when he started receiving pedagogical support. He was referred to our service by the latter school.

A.M.S. went through interdisciplinary assessment, encompassing Speech_Pathology, neuropsychology, Neurological and Psychopedagogical assessments. In this evaluation, considering the family history of learning disabilities, the poor results in phonological skills, intelligence on average, and the fact that he was still be illiterate, despite three years of formal training, the hypothesis of Dyslexia was raised.

A.M.S. frequented Speech-Language Pathology, Pedagogy and Psychology workshops for a semester in a Response to Intervention (RTI) method, aiming not only the development of the student, but

also at confirming the diagnosis, mainly because of the interference of the education system in process. In the following semester, AMS frequented individual Speech-Language sessions.

Thus, AMS was evaluated in three different times, which provided information on the development of reading before any intervention (when evaluated by the multidisciplinary team at his arrival at ELO project); after six months, with school support and interdisciplinary workshops; and one year after the initial assessment, after individualized intervention.

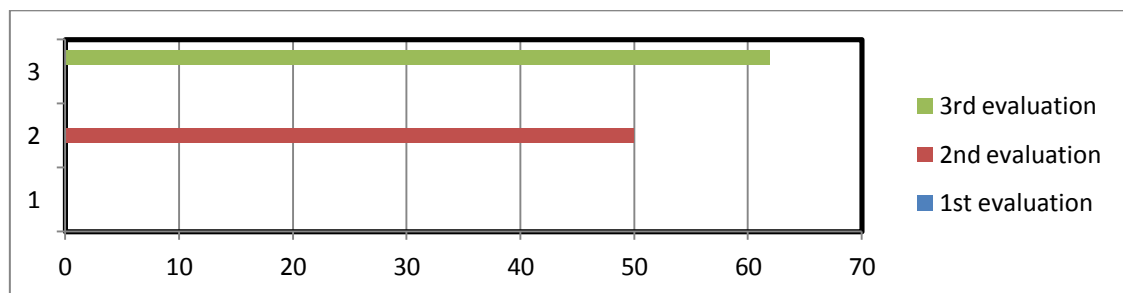
3. Results

The moment A.M.S. arrived in the project, he was illiterate, that is, unable to perform the reading (0 words per minute speed and comprehension 0%) or writing tests. The phonological awareness test PHOMELE (CUNHA, CAPELLINI, 2009) revealed prejudice both in the syllabic area, with mean accuracy of only 47%, and in the phonemic, in which there was no hits (just random). In rapid automated naming (DENCKLA, RUDEL, 1976), the results were very short of his grade. In the analysis of working memory, measured through the repetition of non-words, he presented 100% accuracy up to the words with three syllables (and in words with more syllables, 4-6, his accuracy was 20%).

The data after the group interdisciplinary workshops, together with the school support, showed a very significant gain. In phonological awareness, his accuracy was 71% in the syllabic and 43% in the phonemic part. In rapid automated naming he minimized the gap presented in relation to his classmates. With respect to the non-word repetition, he succeeded repeating words with up to four syllables. His oral reading increased to 50 words per minute and 60% of comprehension.

In the third assessment, his improvement was less significative and the diagnosis was confirmed. He was able to conclude the complete syllabic part of the phonological awareness but difficulties remained in the phonemic part (average of 52% correct). Automated naming and working memory did not suffer great changes, evolving very little since the previous evaluation. However, the intervention allowed an increase his reading fluency to 62 words per minute and 60% of comprehension.

Figure 1. Reading speed of AMS according to evaluation.



The data show that the first improvement was very important for joining both the interdisciplinary workshops, as effective learning support in an inclusive education system, showing that the favorable environment has made his development happen. After this initial trigger, AMS, under individualized intervention, continued to gain reading fluency, despite the fact that Dyslexia characteristics proved to be persistent.

Our results corroborate the literature regarding the finding that in Dyslexia phonological changes, and consequently the existence of a persistent impairment in information processing, access and recovery of it, make it impossible for the dyslexic to obtain accuracy and speed in reading. The deficit in prerequisite skills such as grapheme-phoneme association impair proper reading speed in Dyslexia (DEUSCHLE, CECELLA, 2009). Our data also corroborate findings that show the evolution of students before a comprehensive system that supports and encourages their potential, regardless of their basic difficulties (CIASCA, 2004).

4. Conclusions

A good development of reading and writing skills will depend on intrinsic and extrinsic aspects related to the student.

Despite the biological difficulties related to Dyslexia, environmental factors interfere decisively in the development of these children. The role of the school, with a sensitive look and skilled professionals, make clear the importance of the work in the view of education. After specialized intervention and neutralization of social and environmental variables, AMS has achieved good reading fluency and improvement of phonological skills.

References

- Andrade, A, Andrade, Pe, Capellini S.A.. Alternativa à abordagem diagnostica tradicional de Transtorno de aprendizagem: os modelos de resposta à intervenção RTI. In. Modelo de resposta à intervenção – RTI. Pulso editorial . São José dos campos, SP. 171-184.2014
- Ciasca, S. M. Avaliação Fonoaudiológica do distúrbio específico de leitura e distúrbios de aprendizagem: Critério Diagnóstico Diferencial e Manifestações Clínicas. Distúrbio de aprendizagem: Proposta de avaliação interdisciplinar. Editora casa do Psicólogo. São Paulo 2004. pág 141-164
- Cooper, Jd, Robson, Md, Kiger,ND. Successwith RTI: research-basedstrategies for managing RTI and core reading instruction in your classroom. New York: Scholastic; 2010.
- Deuschle, V P, Cechella, C. O déficit em consciência fonológica e sua relação com a Dislexia: diagnóstico e intervenção. Revista CEFAC, volume 11, Supl2, 194-200, 2009.
- Fuchs, Ls, Fuchs, D. A model for implementing responsiveness to intervention. Teaching Exceptional Children. 2007; 39 (5):14-20.
- Mousinho, R. Desenvolvimento da Leitura, Escrita e seus Transtornos. In. GOLDFELD, M. Fundamentos em Fonoaudiologia - Linguagem. Rio de Janeiro: Guanabara Koogan, 2003 - 2º edição, 39-59.
- Mousinho R, Correa, J. As habilidades de processamento fonológico e seudesenvolvimento nos dois primeiros ciclos do ensino fundamental. In. ALVES, L.M., MOUSINHO, R., CAPELLINI, S.A. (org). Dislexia novos temas, novas perspectivas- volume II. Wak editora. Rio de Janeiro 2013.195-214

SERVICE LEARNING: A HIGH IMPACT PRACTICE WITH FIRST GENERATION, MINORITY COLLEGE STUDENTS

Linda R. Guthrie¹, Ph.D. & Pamela L. Knox², Ph.D.

¹*Center for Service Learning, Tennessee State University (USA)*

²*Academic Affairs, Tennessee Board of Regents (USA)*

Abstract

Higher education today is concentrated on engagement in high impact practices to build a citizenry and workforce for the future. With the focus on the completion agenda, quality, and the viability of college credentials, the value of specific high impact practices to the current and immediate economy has yet to be examined. This paper focuses on one high impact practice, service learning, with first generation, minority students. Service learning is a pedagogical approach in which students apply what is learned in the classroom and/or analyze and solve problems in a real community. The underlying premise is that college students should, along with the formal education, learn to be good citizens by giving back to the community. First-time freshmen (99% first generation, minority students) at a historically Black university in the mid-South of the United States enrolled in a university orientation course engaged in service learning as part of the course requirements. The students identified problems/needs of the surrounding communities and provided service individually, in groups, or through nonprofit organizations. Since 2011, students have identified service learning as the most influential tool in their education providing 153,451 hours of community service. Converting these hours to US dollars equates to over \$3,000,000 in tangible services provided to the city, county, and region. Students engaged in the most community service hours has the greatest degree completion, demonstrating the impact of this as a high impact practice instrumental in building for the workforce of the future.

Keywords: *Service learning, high impact practices, first generation college students, minority college students.*

1. Introduction

The higher education practice of service learning, based on the premise that college students should, along with the formal education, learn to be good citizens through giving back to the community, has been loosely defined as an instructional strategy integrating teaching and student learning in the classroom plus student involvement in field-based experiences (e.g., Axsom & Piland, 1999; Waldner, McGorry & Widener, 2012). The benefits of service learning have been reported across curricula of higher education academic programs at all levels beginning with first semester freshmen (e.g., Bringle, Hatcher, & Muthiah, 2010; Kuh, 2008; NSSE, 2013; Yeh, 2010). Students report deeper levels of learning as well as both practical and personal gains (Kuh & O'Donnell, 2013). Recently, the impact of service learning on first-generation college students and more specifically minority students has drawn attention. First-generation students, i.e., those with neither parent completing education beyond high school (Ward, Siegel, & Davenport, 2012), have increased over the past 30 years averaging between 30-50% currently enrolled across the USA (First Scholars, 2015). This "invisible minority" consist of all demographic, cultural, ethnic, and racial backgrounds (Ward, Siegel, & Davenport, n.d) and are at greater risk for dropping out. As a result, there is an increased focus on high impact practices which help these students become engaged in their learning, their college, and the community. Service learning has been identified by the National Survey of Student Engagement (2015) as one of the top five high impact practices which have direct positive effects on student learning and retention.

As a means of reaching all first semester, first time students, entering freshmen at this four-year historical Black college/university (HBCU) in the mid-South with a high percentage of first-generation student are required to register for a semester orientation class either in the Fall or Spring of their first year. Prior to 2012, each academic department offered an orientation course as an introduction to the major. During the summer of 2012, the orientation courses were reorganized with a standard course

outline as a means of addressing retention of first semester students. Student-identified barriers to retention were identified as financial, health, social support, family support, personal issues, academically unprepared, lack of advisement, procrastination, and lacking a sense of belonging. While the course itself addresses aspects of financial and time management, conflict resolution, stress management, and study and test-taking skills, a component also introduced community service, service learning, and civic engagement to address the issue of belongingness. Aligning service-learning projects to a student's major (e.g., an agriculture major might select to participate in a community garden project; a special education major might choose to develop a map to navigate the campus for the wheelchair bound) were also a component of the course to assist in students clarifying a major or minor.

2. Method

Since fall 2012 to date, the orientation course has been offered five times. At the end of each semester, the university conducts anonymous on-line course evaluations by students. No demographic, racial, or other identification collected. The evaluation is not mandatory yet there were 2,418 responses over the five semesters that the course has been offered. Student course evaluations are reviewed at the close of each academic and course content is adjusted by a committee of faculty and administrators resulting in increases in student satisfaction. The majority (94.4%) of students reported their average number of hours of preparation per week, including service learning, as between 3 to 6. Four items in the evaluation relate specifically to service learning. Students are asked to identify the best tool/method the instructor used to help them learn and to suggest ways to improve the course. Responses and percentages of the items rated "strongly agree" to "disagree" pertaining to service learning were compiled. Ratings were then grouped by "Strongly Agree/Agree" and Strongly Agree/Agree "Disagree/Strongly Disagree". Open-ended responses were evaluated through qualitative methods.

3. Results and Discussion

Although no demographic information was asked for the purposes of this study, the institutional undergraduate demographics are: 81% Black Non-Hispanic, 16% White Non-Hispanic, and 3% other races/ethnicities. By gender, the majority of students are 70% female and 30% male. Of all incoming first time freshmen, approximately 98% are first generation, first semester students (Academic Master Plan 2008-2028, 2008). Student ratings of service-learning specifically reflected that helped them understand the value of service-learning and civic engagement (82.89% "Strongly Agree/Agree", 6.8% "Disagree/ Strongly Agree). Having gained an understanding of applying subject matter to everyday life and real-world settings was rated at 77.42%. The qualitative analysis of the 2,418 responses to best practices in the course yielded 26 categories. Three overlapping categories (service learning, performances, and field experience) were evaluated were collapsed into one. Two other categories (Role Plays and Simulations) were also collapsed resulting in a total of 22 categories. Service Learning was rated by 67.5% of the students as the most helpful practice. Clearly, the students' voices reflect the value of service learning as a high impact practice. See Table 1 for the top 14 categories. (A full list of categories and responses is available upon request from the first author).

Table 1. Qualitative Analysis Results of Most Helpful to Learn (Top 14 Items only)

Category	Total Responses
Service Learning	1,631
Class Discussions	1,286
Syllabus	1,284
Guest Presenters	1,007
Research Papers/Research Projects	800
Power Points	746
Take-home assignments	680
Textbook Readings	662
eLearn	596
Quizzes	448
Videos or Other Media	446
Study Guides	405
Group Projects	395
Class Trips	381

References

- Academic Master Plan 2008-2028 (2008). Retrieved March 17, 2015, from <http://222.tnstate.edu/academic-affairs/documents/AcademicMasterPlan.pdf>
- Axsom, T. & Piland, W. (1999). Effects of service learning on student retention and success. *Higher Education*. Paper, 48. Retrieved March 3, 2015, from: <http://digitalcommons.unomaha.edu/slcehighered/48>.
- Bringle, R. G., Hatcher, J. A., & Muthiah, R. N. (2010). The role of service-learning on the retention of first-Year students to second year. *Michigan Journal of Community Service Learning*, 16(2), 38-49.
- Kuh, G. D. (2008). *High-impact educational practices: What they are, who has access to them, and why they matter*. Washington, DC: Association of American Colleges and Universities.
- Kuh, G. D. & O'Donnell, K. (2013). *Ensuring quality and taking high-impact practices to scale*. Washington, DC: Association of American Colleges and Universities.
- National Survey of Student Engagement. (2013). *Promoting high-impact practices: Maximizing educational gains*. Bloomington, IN: Indiana University Center for Postsecondary Research. Retrieved February 3, 2015, from: <http://www.nsse.iub.edu>
- Waldner, L. S., McGorry, S. Y., & Widner, M. S. (2012). E-service-learning: The evolution of service-learning to engage a growing online student population. *Journal of Higher Education Outreach and Engagement*, 16(2), 123-150.
- Ward, L., Siegel, M. J., & Davenport, Z. (n.d.). *First generation college students: The invisible minority*. Presentation retrieved on March 15, 2015 from: [http://indstate.edu/studentsuccess/pdf/FirstGeneration-final\(1\)%20PPT.pdf](http://indstate.edu/studentsuccess/pdf/FirstGeneration-final(1)%20PPT.pdf)
- Ward, L., Siegel, M. J., & Davenport, Z. (2012). *First-generation college students: Understanding and improving the experience from recruitment to commencement*. Hoboken, NJ: John Wiley & Sons, Inc.
- Yeh, T. L. (2010). Service-learning and persistence of low-income, first-generation college students: An Exploratory study. *Michigan Journal of Community Service Learning*, 16(2), 50-65.

FINGERPAINTS AND MASTERPIECES: BABIES IN THE ART MUSEUM

Marta Cabral¹ & Effie Phillips-Staley²

¹*Teachers College Columbia University (USA)*

²*Dulwich Picture Gallery (UK)*

Abstract

Taking very young children to art museums is not always a positive experience for parents and caregivers, and families may shy away from having such experiences with their children. This poster presents a program designed to provide meaningful and positive experiences for babies (6-18 months) and caregivers in art museums, and an example of its successful implementation at Dulwich Picture Gallery in London, UK. Through rich visual and written text including compelling images and testimonials, this poster presents how this program was catered for one specific gallery and its needs, responding also to broader contextual questions around early childhood explorations of art and education programs in museums and galleries.

Originally designed by a team of art educators/consultants based out of Columbia University (New York, NY), this program is here presented as responding to the context of a specific art gallery. The data presented in this poster refer to the first year of the program's implementation in this location. Through direct observations, surveys, and interviews, data were collected to discuss the need for such a program, successful and unsuccessful aspects of the implementation, and impact on the participants' experiences in the gallery. This poster also presents results from qualitative interpretation of data and offers conclusions relevant to the broader context of education, early childhood, and art education.

Keywords: *Art, Museum education, Early Childhood, Art education.*

1. Introduction

Mini Masterpieces is a program for infants and their caregivers focused on providing meaningful artistic experiences in museum. This program was developed at Dulwich Picture Gallery (DPG) in London UK by the authors of this poster, who are researchers/educators specialized in art education, early childhood, and museum education. This paper presents Mini Masterpieces as an example of an art education program that is specifically design to address the context, population, and resources of a particular art gallery, but that can be adapted to the needs and characteristics of any museum or gallery interested in welcoming infants and families to its core.

2. The program: Mini Masterpieces

As a program serving infants and caregivers, Mini Masterpieces is primarily aimed at offering families with very young children an opportunity to comfortably and meaningfully enjoy and connect with the Dulwich Picture Gallery and its collection. As part of the gallery's education offering, it was designed to fill the previously existing gap in this gallery's programming for families with very young children – a gap that is not uncommon in the field of art museum education. Designed and implemented by trained researchers and educators, Mini Masterpieces also aims to develop and test best practices for working with families with very young children responding to specific needs and characteristics of a particular gallery and its context.

Each session of Mini Masterpieces consists of two separate parts: the first takes place among the artworks in the gallery, while the second part occurs in one of the institution's classrooms. The fact that the core of Mini Masterpieces infants and adults spend time in the museum's prime space and directly interact with it's permanent collection, is of crucial importance to us and one of the design elements that distinguishes Mini Masterpieces. By doing so we actively welcome families with young children as legitimate visitors at a time when the gallery is also open to the general public, potentially interacting with other visitors as well. To scaffold child and adult interactions between themselves and with the artworks, we provide sensory booklets that are designed for each specific session, featuring sensory

elements and contextual information relative to the artworks and theme explored in each session. Even though participants have full access to the galleries and are free to explore at their own leisure, we design each session around a theme stemming from Dulwich's collection and relate it to several artworks that we explore in the booklet. The second part of each session takes place in one of the gallery's classrooms, where children are invited to explore several wet and dry media and different materials specifically adapted to young children, all of them safe and appropriate for the age-range of the young participants.

One of the elements that distinguishes Mini Masterpieces from other early childhood programs in museum education is the fact that it aims to provide meaningful experiences not for the child only (with the caregiver seen as a mere "carrier" or "facilitator" as many mommy and me tours are designed) nor for the adult only (with children being "allowed in" but not always "catered for" as in many traditional "stroller-tours"). Although there is value in these kinds of offerings, we designed Mini Masterpieces with child and adult as equal parts of a dyadic learning unit that is at the core of our program. In this way, Mini Masterpieces aims to offer and scaffold meaningful experiences for both the child (based on sensory art-play) and the adult (based on exhibition-based content).

3. Mini Masterpieces design principles: for the child, for the adult, and for the gallery

Mini Masterpieces is based on the belief that for young children there is no clear boundary between artistic experiences, play, and other interactions within their world. Artistic explorations are part of their ordinary life, and should be taken in a holistic manner. Therefore artistic experiences can only benefit from being based on sensory and physical explorations, since these are at the core of young children's ways of interacting with the world. It is important that all materials are accessible, manageable, and safe for infants, so that through their experiences and explorations with materials children may have the opportunities to understand that their actions have a physical impact in the world (CABRAL, 2014). For example, by working with paint on paper, infants may begin to realize the physical connection between their body motions and the marks they make (BURTON, 1986).

The adult is also seen as more than a caregiver in this situation. Our goal is to involve adults and children as equally important parts of this program, encouraging caregivers to engage with artworks and art materials along with their children. This shifts their role from one of "accompanist" to full partnership in exploring and learning. With this in mind, Mini Masterpieces aims to offer adults enjoyable and comfortable experiences in the museum, which is both a requirement and a result for each child's comfort as well. As we design each Mini Masterpieces session, we keep in mind that adults need time to explore and engage with artworks as much as children do, and that this engagement can be scaffolded with, for example, prompts to think about the artwork, child/adult friendly sensory explorations based on each artwork, and contextual information on the pieces exhibited in the gallery.

Finally, we design Mini Masterpieces to serve the museum's specific needs as well: by offering the program in the gallery with experiences that relate both contextually and visually to artworks in the permanent collection, we aim to honor Dulwich Picture Gallery as a space of artistic, historical and architectural significance. Activities and the gallery experiences are intended to help families comfortably connect with Dulwich Picture Gallery in a way that expands visitorship and community awareness.

4. Research study

4.1. Goals and methods

Over the first year of implementation of Mini Masterpieces conducted a formative evaluation to help us assess the program and develop strategies to improve it. Aiming to understand what we could learn by listening closely to adult participants who share their experiences of Mini Masterpieces, we collected data that informed our understanding of what adult participants value about the program; what they found less satisfying; and how might the experiences of these adults inform the design of future Mini Masterpieces sessions and of the program in itself.

Participants in the evaluation of Mini Masterpieces were adults with one child age 6-18 months who elected to enroll in Mini Masterpieces and did so independently through the gallery's website. Data was collected in direct observation of six adult/child pairs as they were attending one of the sessions; six semi-structured interviews of randomly selected adult participants; and a post-session online survey. Data was analyzed with Framework Analysis, allowing us to look at data in a qualitative manner.

4.2. Preliminary findings

Preliminary data analysis shows that overall satisfaction with the program is high. When asked "overall, how would you rate your experience of MiniMasterpieces on a scale of 0-10, with 10 meaning you were extremely satisfied with your experience and zero meaning you were extremely dissatisfied?"

the weighted average of participants' responses is 9, which indicates a high level of satisfaction. However, when prompted to point out elements that they were less satisfied with, some caregivers pinpointed what they thing could be areas for improvement.

Table one shows examples present in data about what caregivers most value about MiniMasterpieces:

Table 1. What do caregivers value about the program?

Valued Element	Example
Perception of child's enjoyment	"Seeing my daughter explore and delight in her surroundings"
Child's access to art and art materials	"Letting my daughter explore painting and different art mediums [sic]"
Resources provided	"The artworks were brought to life with dry leaves and colored film paper. She still loves her colored film!"

As we can see, caregivers value both access to art and art materials in and with the resources provided, but also the perception of how much their child is exploring her experiences. One aspect that stands out in our readings of these data, is that adult engagement was not pointed out by any of the participants as a strong point of the program, even though our observations showed that some of the caregivers who were interviewed actively engaged with their children in exploring both artworks in the gallery and art materials in the studio. In several occasions we observed that adults were engaging with the art materials on their own, even if their child was not interacting with the same materials hands-on.

As for the less satisfying aspects, we noticed two different strands of opinion in the data we collected: some caregivers perceived their children to be too young for some of the suggested materials ("my child was a bit too young for the paints and so I had to restrain him"), while others would have liked more structure and formal teaching ("I would like more teaching of skills, and less freedom for me to do what I want to engage my son"). Both these ideas relate mostly to the perception of the child being or not "able" to participate in the proposed activities: while most caregivers found the activities and materials appropriate for the age range of the children, some perceived them to be either too "advanced" or "not advanced enough."

5. Conclusion

As we design future Mini Masterpieces sessions taking into account what we have learned from this study, we do so with the following goals in mind:

- Create effective ways to share the reasoning behind our program design with parents and caregivers in order to increase their understanding of how young children engage with and benefit from art activities;
- Diversify sensory experiences for young children in order to accommodate different learning styles and different parental expectations;
- Increase adult engagement with the collection by developing and testing more ways of introducing art historical content.

Although the findings presented in this poster are preliminary and research is still in course, data strongly points to the importance of a program like Mini Masterpieces, which is consistent with the strong acceptance of the program by the local community, shown by the fact that most sessions at Dulwich sell out and often have wait-lists.

As we continue to develop Mini Masterpieces and design similar programs for other institutions and contexts, we reiterate our commitment to our strong belief that babies should be welcomed as legitimate visitors to art museums and that the child-caregiver dyadic learning unit is at the core of the programs we offer.

References

- Burton, J. (1986). Developing Minds: Beginnings of Artistic. *Language School Arts* September, pp. 6-12.
- Cabral, M. (2014). *Broken things can be beautiful things. Early childhood explorations in play and art*. New York: Vast Playground.

TOWARDS A SUSTAINABLE FUTURE FOR SCHOOLS: ENOUGH FOR ALL, FOREVER

Dr. Rosemary Papa

*Del and Jewell Lewis Endowed Chair of Learning Centered Leadership
School of Education, Northern Arizona University (USA)*

Abstract

Public service on behalf of the common good has been the traditional mission of public schooling. Managing change is what school administrators do, as well to develop a sense of futurity to ongoing improvement of students. How do school administrators and teachers model and teach sustainability values and practices?

Keywords: *Sustainability, leadership. Management, education*

Sustainability is one of the most pressing issues for humanity. People often make the mistake of associating sustainability only with environmental issues. Economic and social are also dimensions of sustainability and the politics of nation/states. A true school leader of sustainability should think how, beyond any self-interest, s/he can transform improvements resulting from the dynamic process into far-reaching and lasting reforms that can secure a more prosperous future for their students.

Within this framework, this poster session aims to go beyond a focus on the role of leadership in sustainability and to help educational leaders and teachers apply their leadership within a sustainable framework and hence make more effective decisions for their organization and to teach students a sustainable model for their community, state/nation, and the planet earth. The public service responsible for this matter is education since through an effective education system, social beings are shaped, knowledge is transferred and intellectual levels are improved. With this in mind, the focus of this discussion will be on the public service of education students through civic education, happiness, and the modeling and teaching of *enough for all, forever*.

The poster session covers major aspects of sustainability for educational leaders which forms the basis for a book to be published by Springer Publishing:

- Leadership for sustainability to include the challenges of sustainability, paths to sustainability, and partnerships and principles.
- Leadership and change involving knowledge management and the link to leadership, leadership tasks and leadership and organizational culture.
- Developing sustainable leadership and management capabilities by modeling sustainable practices, decision making and policies to operationalizing sustainable ideals.
- Factors influencing success in sustainable leadership including justice, morality and the common good.
- Best practices in sustainable leadership involving political decisions regarding economic, environmental and social practices.

References

- Blewitt, J., & Cullingford, C. (Eds.). (2004). *The sustainability curriculum: The challenge for higher education*. New York, N. Y.: Earthscan-Routledge.
- ESD Organizations. (2014). Kappa Delta Pi and UNESCO education for sustainable development. Retrieved from <http://www.kdp.org/initiatives/ESDorganizations.php>
- Kappa Delta Pi. (no date). Education for sustainable development: How to get started for elementary teachers. Retrieved from <http://www.kdp.org/initiatives/pdf/ESDElementaryTeachers.pdf>
- Kappa Delta Pi. (no date). Education for sustainable development: How to get started for middle school teachers. Retrieved from <http://www.kdp.org/initiatives/pdf/ESDMiddleSchoolTeachers.pdf>

- Kappa Delta Pi. (no date). Education for sustainable development: Activities and resources for high school teachers. Retrieved from <http://www.kdp.org/initiatives/pdf/ESDHighSchoolTeachers.pdf>
- Kappa Delta Pi. (no date). Education for sustainable development (ESD): How to get started for teacher educators. Retrieved from <http://www.kdp.org/initiatives/pdf/ESDTeacherEducators.pdf>
- Smith, G. A., & Williams, D. R. (Eds.). (1999). *Ecological education in action: On weaving education, culture, and the environment*. New York, NY: State University of New York Press.
- United States Teacher Education for Sustainable Development Network. (2013). Reorienting teacher education to address sustainability: The U.S. context, white paper series, no. 1. Indianapolis, IN: USTESD Network. Retrieved from http://www.kdp.org/initiatives/pdf/USTESD_WhitePaperOct13.pdf
- Woodhouse, J. L., & Knapp, C. E. (2000). Place-Based Curriculum and Instruction: Outdoor and Environmental Education Approaches. *ERIC Digest*. ERIC Identifier: ED448012. Retrieved from <http://www.ericdigests.org/2001-3/place.htm>

THE USE OF VIRTUAL LEARNING ENVIRONMENTS AT FEAUSP

Andrea Consolino Ximenes

School of Economics, Business and Accountancy, University of Sao Paulo (Brazil)

Abstract

Since 2004, an education and technology project takes place at FEAUSP: the use of virtual learning environment to improve the interaction of students and teachers on undergraduates and graduated courses. This project was developed on a FEAUSP platform and has the basic tools for virtual studies. So this study intends to analyze what can be done to keep offering a quality service to teachers and students. Furthermore what can be done to work with the most effective tools to stimulate online courses. The analysis was done from internal data of the system, that is, what is the most used tool and how is it used; what improvements were well received; what were not; what is the solicitations of the teachers. As results, could be said that files repository was the most used tool. But in a so connected and interactive world is this the best service that it could be offered? Beside the data shows that despite the high numbers of environment use, some teachers are looking for other systems that provide different tools such as quiz and video streaming. With the study it could be concluded that there is a necessity of develop of new tools, considering the teachers search for a new kind of interactions and the virtual environment that everyone is surrounding these days. This step will renovate the way the virtual environment is used and it will be able to improve the learning teaching process in this school.

Keywords: *Virtual learning environment, virtual studies*

1. Introduction

The process that will be analyzed is part of a project held at School of Economics, Business, Accountancy of University of Sao Paulo (in Portuguese, FEAUSP) since 2004. The project aim is to make available virtual environments of learning to facilitate the communication between teacher and students and to improve the process of teaching and learning.

From 2008 the use of virtual learning environment had a period of stability for some years with a high usability rate. During this time the technical staff improved the tools, considering the necessities of the teachers.

Besides all the improvement in the system of virtual environments, in the last two years, the use rate of Erudito is reducing, while teachers are even more choosing Moodle tools to help on the virtual activities of their courses.

On this work will be present some data and ideas to explain this decay and the comparison between the use of tools on Erudito and Moodle system.

2. Context

In 2004, FEAUSP developed a system to create virtual environments to all disciplines at Undergraduate and Graduate courses. This system was called Erudito that is defined by its developer as a "creation of a Virtual Environment, based on Internet technology to support the teaching, learning and research process. It allow the conception, implantation, operation and management of a complete infrastructure to create, conduct and manage teaching, learning and research in presence courses, distance courses, distances complementation from presence courses, research projects, collaborative projects, and other support tools for distances activities of learning and teaching" (VIDAL, 2005).

The process is a service that Laboratory of Learning and Teaching (LAE, from Portuguese Laboratório de Aprendizagem e Ensino), a section of the faculty. The service that is offered to FEAUSP community is the creation of virtual learning environments on Erudito system to the courses and the availability of technical support to teachers and students.

Nowadays the offered service is well known in the FEAUSP community and has a great number of users (for example, each undergraduate student at FEA has an active Erudito account and it is logged in at least one discipline). The percentage of Erudito use rate of virtual environments from 2008 to 2012 was 85%-90%, but this data has decrease in the last years.

Since the beginning of the service, the process is based on academic researches and some theories that guide the work are now presented.

ARAÚJO & MARQUESI JR (2008) explain in their article that virtual learning environments "are define as spaces that simulate the classroom environment thought the use of information and communication technology (ICT)". So it is considered important to held, improve and develop tools that could make this possible.

MORAN (1997) says "the presense education can change itself significantly with the electronic chains", because students have new information all the time on Internet ant this knowledge could appear on classroom (questions, discussions and points of view). MORAN (2000) highlights the activities on virtual environments can promote discussions and learning. Following this theory, the use of Forums is always stimulated, in distances or presense courses.

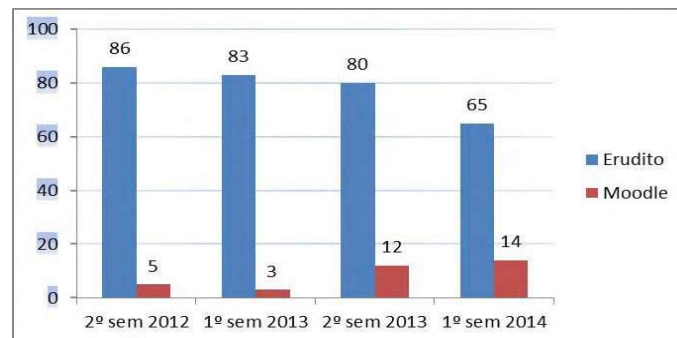
VARELLA (2002) also presents his impression of classroom with the application of virtual environments: "expansion of classroom". On the other hand, if teachers does not have technology skills, the learning-teaching process will not be improved (MASETTO, 2003), because the virtual environment will be used only as file repository

3. Discussion

LAE manages the virtual learning environments that have the following tools: Bulleting Board, Links, File Repository, Submit Exercises, Forum and Grades. To this work, it was studied the data of the Erudito and Moodle use from Department of Accountancy and Actuarial Sciences (DAAS).

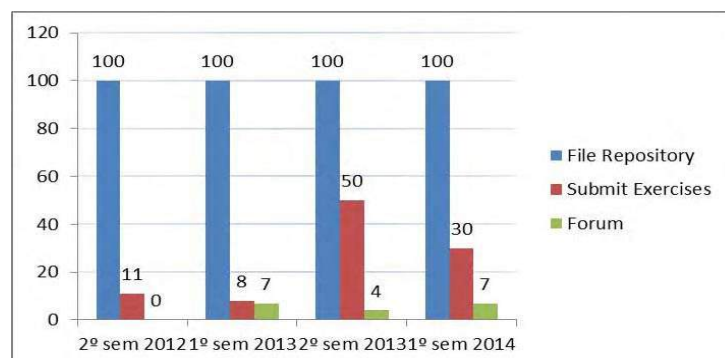
In an analyses made between second semester 2012 and first semester 2014 (Figure 1) was observed a a descent line in the Erudito use and a parallel increase in the numbers of Moodle system (that is held by USP).

Figure 1. Percentage of use from virtual learning environments on Erudito and Moodle systems



The Figure 2 illustrates the use of the three main tools on Erudito system: File Repository, Submit Exercises and Forum. Every teacher that chooses Erudito (100%) employs File Repository, so it is the most used tool on Erudito. The data shows that Submit Exercises had a growing in the second semester of 2013, when an improvement was done on this tool. Forum still presents a crescent line, but has a use average very low.

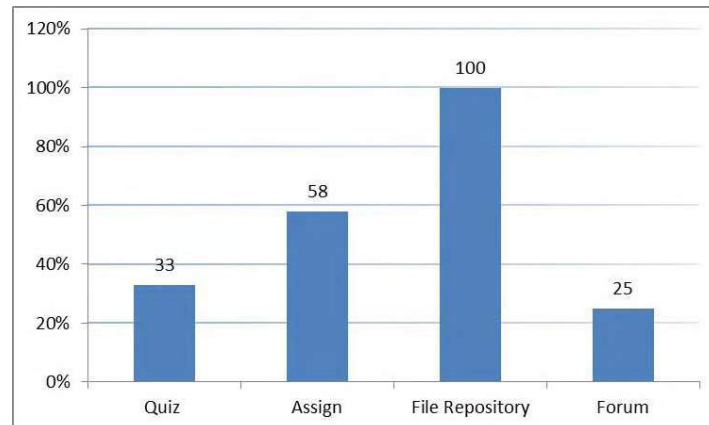
Figure 2. Percentage of tools use on Erudito system



This analysis was accomplished to test the hypothesis that a decay of the Erudito use on (DAAS) is related with the more interactive tools (as Quiz and videoconference) from Moodle system, because these tools are important to build a communicative environment and a space besides the classroom.

From 83 disciplines in the first semester of 2014, 14% choose Moodle as an option of virtual learning environment (Figure 1). From these, 58% used the equivalent tool on Moodle for Submit Exercises (Figure 3), that can explain the decay presented in Figure 2. It is also possible to observe that the tools Quiz and Forum had a percentage of use lower than the media, 33% and 25%, respectively. Despite that, statistically, the use of interactive tools for the teachers that choose Moodle is superior than the ones that choose Erudito. It must be said that Erudito does not have a Quiz tool, but according to the percentage that is not the reason for the Moodle choice.

Figure 3. The percentage of Moodle system use.



3. Conclusion

Comparing the percentage of use of Erudito and Moodle it can be seen that the interactive tools are used, but the number is not as meaningful to testify that teacher are choose Moodle considering this reason.

Nevertheless, it is correct to assert that in order to offer a better service, LAE most to consider the numbers of Moodle and try to develop some tools on Erudito system. There is a sentence from Moran (1995) that says "each successful innovation changes the individual threshold requirements". So it is important and necessary to observe constantly new tools that could be integrated in the system.

References

- Araújo Jr, C.F. & Marquesi Jr, S.C. (2008). Atividades em ambientes virtuais de aprendizagem: parâmetros de qualidade. In LITTO, F.M. & FORMIGA, M. (Eds.), *Educação a distância: o estado da arte* (358-368). São Paulo: Pearson Education do Brasil.
- Masetto, M.T. (2003). *Competências Pedagógica do Professor Universitário*. São Paulo: Summus Editorial.
- Moran, J.M. (1995). Novas tecnologias e o re-encantamento do mundo. *Tecnologia Educacional*, 23, 24-26.
- Moran, J.M. (1997). Como utilizar a Internet na educação. *Revista Ciência da Informação*, 26, 146-153.
- Moran, J.M. (2000). Ensino e aprendizagem inovadores com tecnologias. *Revista Informática na Educação: Teoria & Prática*, 3, 137-144.
- Varella, P. G.; Vermelho, S.C.; Hesketh, C. G.; Silva, A.C.C. (2002). Aprendizagem colaborativa em ambiente virtuais de aprendizagem: a experiência inédita da PUCPR. *Revista Diálogo Educacional*, 3, 11-27.
- Vidal, A.G.R. (n.d.) Projeto Erudito. Ambiente Virtual de Apoio ao Ensino Presencial e à Pesquisa. Plataforma tecnológica para apoio ao ensino e à Pesquisa. Retrieved November, 20, 2014. <http://www.erudito,fea.usp.br/portalfea/Repositorio/0/Documentos/Erudito/ProjetoEruditonaFea.pdf>

A TRANSITION FROM THE BEGINNER TO THE MENTOR: A CONTRIBUTION TO FURTHER EDUCATION OF PRESCHOOL, PRIMARY AND SECONDARY SCHOOL TEACHERS

Adriana Wiegerová¹, Peter Gavora² & Hana Navrátilová¹

Tomas Bata University in Zlín (Czech Republic)

¹*Department of School Education*

²*Research Centre FHS*

Abstract

Professional growth of teachers and career system formation of educators plays a relevant role in the current educational discourse in the Czech Republic. The paper describes this particular discourse and proposes a solution in a project implemented at the Faculty of Humanities at Tomas Bata University in the Czech Republic. The project, supported by the Czech Fund of Educational Policy, started in 2014 and was aptly named A Transition from the Beginner to the Mentor. The project focuses on professional assistance given to teachers at all levels of schools and at all stages of their teaching career. The addressees of this project are novice teachers, advanced beginning teachers, and competent and proficient teachers at preschools, primary and secondary schools. Instructional modules, which started to be implemented in 2014, were created for all of these groups. In addition, a strategy of networking of the schools in the Zlín region in the Czech Republic was developed, which opened the possibilities of collaboration in this project.

Keywords: *Educational discourse, further education of teachers, professional assistance, networking of schools*

1. Introduction

The issues related to the professional growth of teachers and the formation of the system of educators are topics that play a significant role in the current educational discourse. Therefore, it is clear that the project is more than topical in the Czech Republic. Its participants are the teachers at all levels of schools, in all stages of their professional development. That is one of the reasons why the project is entitled “From the Novice Teacher to the Mentor.” Its aim is to provide a specialized professional assistance to teachers at all stages of their professional development.

This project supports a large group of teachers, from preschool teachers to secondary school teachers, who are at various stages of their professional development. Their positions may vary from novice teachers to teacher mentors. The project started in September 2014 and will run till December 2016. The project is financed by a grant from the Educational Fund of the Ministry of Education and Sports of the Czech Republic. This fund sponsors activities of universities that promote quality of lifelong learning of teachers at all school levels.

At the current stage of the project, the modules are being created and assessed. The project aims at providing support for professional development of practising teachers, support for the development of communicative skills of novice teachers, support for the development of the cooperation between novice teachers and teacher mentors and support for the enhancement of the bonds among the members of teaching staff. It also aims at improving the participants’ skill of self-assessment on a given level of their professional development.

2. Focus on Regional Schools

The focus of the project is on the schools in a specific region rather than on the nation-wide network of schools. In the Czech Republic, the Zlín region has had peculiar cultural, educational and institutional traditions (for instance many one-room schools at pre-primary and primary levels).

The region was selected to represent an environment with an abundance of small towns and villages. The schools in the Zlín region are interconnected, partially because they cooperate with Tomas Bata University - they provide professional practice for student teachers.

3. Modules

The support for teachers is provided in the form of instructional modules. The module is a self-contained course for a particular target group of teachers. Each module is for 10-20 teachers who can participate in the learning process for free, as long as the module is part of the project.

1. *Support during the adaptation of the novice teachers in the school environment:* This module offers assistance to novice teachers during their adaptation process in the school environment. It instructs novice teachers about cooperation strategies between other teachers in the teaching staff, cooperation with parents, and cooperation with teacher mentors. Target group: novice teachers at preschools and primary schools.
2. *Support of teamwork among teachers in the teaching staff:* This instructional module offers knowledge on team leadership, cooperation and self-reflection regarding one's attitude towards working in a team. Major focus will be on the activating teaching methods and self-reflective techniques. Target group: teacher mentors.
3. *Support of the project methods and cooperative teaching at preschools, primary schools and secondary schools in the Zlín region:* This instructional module introduces teachers to innovative instructional methods and forms. It focuses on project methods and cooperative teaching. It provides examples of the main features and principles of project and cooperative teaching and their application. It also suggests appropriate forms of assessment and self-assessment of children and pupils. Practical output of the module is a teacher's lesson plan that uses the project method. Target group: primary school teachers.
4. *Specific instructional modes in one-room schools:* This instructional module introduces participants to the organization of the teaching process in one-room schools. It shows examples of traditional instructional methods, which include both teacher's presentation of the subject matter and independent pupils' learning. However, it also includes less traditional instructional modes, such as streaming and individualization, which - in accordance with principles of inclusive pedagogy - does not stream pupils by age or by any other characteristics. Target group: teachers at primary one-room schools.
5. *Using pupils' portfolios:* The aim of this module is to acquaint participants with pupils' portfolios and to instruct them how to use it in presentation of qualitative outcomes of the learning process. This is in accordance with the holistic teacher professionalization model. Participants will also be motivated to work with pupils' portfolios and also to do research with it. Target group: primary and secondary school teachers in the Zlín region, and teachers at one-room schools.
6. *Reflective techniques in teacher's practice. Self-regulation:* This module focuses on usage of reflective techniques. Participants acquire general knowledge regarding reflecting on their own instructional strategies and methods. With the help of practical exercises and role playing, the participants acquire fundamental experience with some reflective techniques. Target group: novice teachers at primary and secondary schools.
7. *Evaluation and self-evaluation strategies of teachers at preschools, primary and secondary schools in the Zlín region:* This instructional module caters for the needs of teachers in the Zlín region regarding evaluation and self-evaluation of schools. It offers information on the recent trends in school evaluation, especially on self-evaluation of schools. Target group: teachers at preschools, primary and secondary schools in the Zlín region, and teachers at one-room school.
8. *Support in presentation of teaching experiences in a foreign language:* This module is practically oriented and it focuses on practicing the skills that are necessary for effective presentation. The main focus is on practical training of individual skills; theoretical knowledge concerning the presentation will be minimal. Participants will be able to observe their own progress regarding the changes in their attitudes, knowledge and skills. They would later be able to use these skills when training their pupils. Target group: teachers at preschools, primary and secondary schools in the Zlín region, and teachers at one-room schools.
9. *School networking and training of supervising teachers to support the teaching practice of Tomas Bata University students:* This module offers a possibility to improve the competences of those teacher mentors who participate in training of the new generation of teachers. Target group: teacher mentors who cooperate with faculty as supervising teachers.

10. *Training of a teacher mentor*: This module focuses on creating a concept of mentor's work at preschools and primary schools. It demonstrates strategies that support quality work of a teacher mentor at school. The module also shows the possibilities of creation and subsequent coordination of adaptation programme for novice teachers. Target group: teacher mentors for preschools and primary school.
11. *Analysis of the teacher's work with ill children*: This module offers an overview of the most common children's illnesses, health risk factors and illness prevention. It also presents skills on how to work with ill children at schools, how to create positive environment for them and, if necessary, how to give first aid in life-threatening situations. Target group: teachers at preschools, primary and secondary schools in the Zlín region.
12. *Methods of processing data from self-evaluation of schools*: This module caters for the needs of teachers in the Zlín region regarding analysis of data from self-evaluation of schools. It offers supportive strategies aiming at effective statistic data processing. The aim of this module is also to create a platform for cooperation between schools and teachers in the Zlín region who deal with the self-evaluation and development. It offers a chance of competence development of teachers but also of implementation of innovations in the self-evaluation processes. Target group: teachers at preschools, primary and secondary schools in the Zlín region and teachers at one-room schools.
13. *Preparing a high-quality instructional project*: This module provides an opportunity to clarify the basic steps in preparation and application of the project theory and integrated thematic education. It also enables participants to prepare lesson plans for their courses. Target group: novice teachers at primary schools
14. *Acquiring strategies for improving teachers' memory skills*: This module offers professional knowledge regarding memory functions in connection with conditions for effective mental work. Participants learn a range of techniques that improve the learning of various types of material. Target group: novice teachers at preschools, primary and secondary schools in the Zlín region.
15. *Dealing with children with learning disabilities*: This module focuses on introducing the participants to diagnostics, prevention, compensation and re-education of pupils with learning disabilities. Participating novice teachers will acquire skills in dealing with children with specific learning disabilities. The experienced teachers/mentors will refresh their already acquired skills, which they are to provide for novice teachers. Participants will also learn of the newest trends in dealing with children with specific disabilities. Target group: novice teachers, experienced teachers and teacher mentors at primary schools.

Schools' strategies in cooperating with parents: This module offers both traditional and modern strategies in cooperation between school and families. These strategies have originated abroad but have also been tried in the Czech Republic with very good results. Target group: novice teachers at preschools and primary schools.

4. Current Stage of the Project

Currently, the project is entering its second phase. The practical implementation of the modules presented in this paper is to start in July 2015. The project does not focus on research, however, a part of the project will be assessed, the report of which will be available after the practical implementation of the modules in 2016, i.e., in the third phase of the project. A part of the project aims to engage the support of professionals abroad, who may become potential co-workers in the future. All project-related work has been accomplished as expected and all planned outcomes of the project for the year 2014 have been completed.

References

- Penso, S., Shoham, E., Shiloah, N. 2001. First steps in novice teacher's reflective activity. *In Teacher Development*, vol. 5, no. 3, s. 323 – 338.
- Taghilou, M. R. 2007. From reflective teaching to effective learning: A new class order. *In Iranian Journal of Language Studies (IJLS)* [online]. vol. 1 (2), [cit. 2011-11-16 Retrieved from: <<http://www.eltanet.org/Kamil'spaper.pdf>> eISSN: 2157-4901.

THE POSITIVE EXPERIENCE OF STUDENTS IN LARGER CLASS SIZES AND INNOVATIVE TECHNOLOGY RELATING TO THAT END

Karen Fraser¹ & Colette McCreesh²

¹*Higher Education Academy (UK)*

²*Queen's University Belfast (UK)*

Abstract

The number of students studying Computer Science / IT has soared over the last 10 years. Module owners, lectures, IT support and teaching support staff have all collectively groaned as they have felt challenged and overwhelmed by this change. “How can I deal with increased numbers? Will my individual student have a less positive outcome being one of a large class of 200, 300 or possibly 400?”

This is because research has shown that there is a negative relationship between larger class sizes and student achievement. As a general rule, a student in a larger class has less one-on-one time with the teacher which in turn means less instruction time which naturally leads to lower test scores. Does this mean that the lowering of standards is a foregone conclusion? Or can something be done? Can technology help? What technology is “out there”? What ideas are “out there”? What are the positives, if any, of being in a large class?

What are the disadvantages? Can these disadvantages be overcome? If so, what help/resources are available? In other words, can we maximise the positives? Can we turn some of the ‘negatives’ into ‘positives’?

Are there inter disciplinary tips could be exchanged between schools with large numbers? Can medicine help Computer Science and vice versa? (Today’s example of large schools would be found in Computer Science, Medicine and Law).

Keywords: *Technology enhanced learning., large class sizes.*

WORLD-WIDE COLLABORATIVE NETWORK OF SCHOLARS: THE FLAGSTAFF SEMINAR EDUCATIONAL LEADERS WITHOUT BORDERS

Dr. Rosemary Papaⁱ

*Del and Jewell Lewis Endowed Chair of Learning Centered Leadership
School of Education, Northern Arizona University (USA)*

Abstract

The educational project presented in this poster session is a hosting of a discussion with scholars world-wide interested in collaborative networking based on the common global denominator that every country has children underserved by schools. The organization's mission is built upon social justice issues, new technologies and the interconnectedness of world economies.

Keywords: *International. Networking, schooling, leadership*

Across the globe many children fall between the spaces of nation states and educational opportunities cannot be addressed by only one nation state. Our main objective is all children have a right to go to school. We believe as scholars we should try to confront the crisis that faces education from the neo-liberal threat in the U.S., in the remainder of the world, and the exponential chasm between 'haves' and 'have not's' in access to schooling. It is truly a frightening vision to imagine a world where most people aren't educated because it requires too many tax dollars; because they are female; they are from a lower caste; they live rurally, or that they are educated, but only in a very narrow context that is intended to serve the needs of multinational corporations or a nation's dominant culture. The poster session posits two fundamental questions: How do scholars become citizens of the world? And, how can educational leaders think above national boundaries and politics? The goal is a discussion of these ideas and others posed by the END 2015 conference attendees.

The Flagstaff Seminar: Educational Leaders Without Borders posits four basic concepts:

- *All children have a right to go to school;*
- *Education should draw out of humans the potentialities of a progressive humanity which is inclusive and respectful of difference;*
- *Schools are a leveraging institutional force for greater equality and opportunity; and*
- *Educational leaders can and must become emboldened to step out of the school/state nexus so that we can become true educational leaders without borders.*

We are not interested in an organization which is chiefly:

- An academic debating society interested in only constructing an agenda which appeals to academic or scholarly matters to the exclusion of political, economic, and social issues impacting education and schooling in the nations of the world. Therefore we see an *activist* aspect of our work without that work becoming an international aid society or one which replicates aspects of domestic or international Peace Corps or other non-governmental agencies agendas.

- Advancing a socio-political agenda which is the province of any specific government, foundation or think tank and to function outside or in some cases, in spite of, those agendas. We remain skeptical of and not beholden to the academic, intellectual, cultural or historical precedents which continue to influence other scholarly, research, or academic organizations, whether they be those joined by individuals or by institutions. We want our efforts to be outside of these traditional spheres of influence to create the most intellectual and political space in which to function.

Of critical concern is the fact that schooling is a cultural process whereby each nation defines and promulgates a specific cultural view to be imposed on some or all of its children. The main feature of the political process is that it is essentially arbitrary and the culture or cultures eventually included in the schooling process assume a privileged position over all other possibilities or alternatives which could have been selected. The process of selection is most often political and value laden. And, it seems nearly universal that those who control the schooling process use it to their advantage and to enhance, preserve and protect their own social position.

In this analytic the most critical relationship involves that of the school and the state. And at the heart of this conversation is the matter of whether the individual is to serve the means and interests of the state solely, and/or if the state allows the individual the room and choice to develop his or her own humanity in ways which are congruent with becoming fully human, irrespective of the dominant interests and prejudices which typically are at work in schools of the state that are heavily influenced by social class, wealth, gender, race, religion or sexual orientation.

It is our belief that the FS should not only be concerned about who is and who is not in the schools worldwide, but the nature of the content and process of schooling which continually place some students, their families and cultures, at a disadvantage for the resources and rewards of the larger social system. This poster presentation will discuss the ongoing formation of Flagstaff Scholars and the organization *Educational Leaders Without Borders*ⁱⁱ with interested colleagues.

References

- Alexander, A. (2012, February 6). Trends. *2012 Digital divide statistics: Infographic*. Retrieved September 1, 2012 from <http://ansonalex.com/infographics/2012-digital-divide-statistics-infographic/>
- Amnesty International. (2012). *Human rights issues*. Retrieved October 4, 2012 from <http://www.amnestyusa.org/our-work/issues>
- Ash, T. G. (2012, November 22). Freedom & diversity: A liberal pentagram for living together. *The New York Review of Books*, 59(18), 33-36.
- bab.la Dictionary. (n. d.). *Conscientização: Portuguese-English translation*. Retrieved October 4, 2012 from <http://en.bab.la/dictionary/portugueseenglish/conscientiza%C3%A7%C3%A3o>
- Barnett, W. S. (1998, March). Long term cognitive and academic effects of early childhood education on children in poverty. *Preventive Medicine*, 27 (2), pp. 204-207. Retrieved August 31, 2012 from <http://www.sciencedirect.com/science/article/pii/S0091743598902754>
- Bourdieu, P. & Passeron, J.-C. (1979; 1964). *The inheritors: French students and their relation to culture*. R. Nice, Trans. Chicago: University of Chicago Press.
- Charles, H. (2012). Personal communication.
- Education for All (EFA). (2012-1995). *Education for all movement*. Retrieved October 4, 2012 from <http://www.unesco.org/new/en/education/themes/leading-the-international-agenda/education-for-all/>
- English, F.W. (2012, May). Bourdieu's *misrecognition*: Why educational leadership standards will not reform schools or leadership. *Journal of Educational Administration and History*, 44 (2), 155-170.
- Fraser, N. (2010). Re-framing justice in a globalizing world. In T. Lovell (Ed.) (*Mis*)*recognition, social inequality and social justice* (pp. 17-35). London: Routledge.
- Freire, P. (1970). *Pedagogy of the oppressed*. N.Y.: Herder and Herder.
- Freire, P. & Macedo, D. (1993). *Pedagogy of the city*. N.Y.: Continuum Publishing Group.
- Huff Post. (2012, June 28). Education: Homeless students top 1 million, U.S. says, leaving "advocates" horrified. Retrieved December 3, 2012 from http://www.huffingtonpost.com/2012/06/28/homeless-students-us_n_1635709.html
- Kimber, M. & Ehrich, L. (2011). The democratic deficit and school-based management in Australia. *Journal of Educational Administration*, 49 (2), 179-99.
- Marks, E. D. (2000). From post-cold war to post Westphalia. *American Diplomacy*, p. 1. Retrieved November 30, 2012 from http://www.unc.edu/depts/diplomat/AD_Issues/amdipl_14/marks_westph.html
- No Author. (2012, October 22). *TIME*, 180 (17), 13.
- No Author. (2012, October 22). *TIME*, 180 (17), 33.
- Sandel, M.J. (2012). *What money can't buy: The moral limits of markets*. New York: Farrar, Straus and Giroux.
- UNICEF. (2011). *Global Initiative on out-of-school children: UNICEF and the UNESCO institute for statistics*. Retrieved on May 1, 2012 from http://www.unicef.org/infobycountry/files/Final_OOSC_Flyer.pdf
- UNICEF. (2012). The state of the world's children, executive summary: Children in an urban world. New York: United Nations Children's Fund.
- Wilkinson, R. & Pickett, K. (2010). *The spirit level: Why greater equality makes societies stronger*. New York: Bloomsbury Press.

ⁱPortions Adapted from Papa, R., & English, F. (2014). *Framing an International Imaginative Identity*. Retrieved from <http://www.educationalleaderswithoutborders.com/who-we-are.html>

ⁱⁱWe have conjoined conferences in Washington, D.C. (2015) August 1-7; Detroit, Michigan (2016), and Puerto Rico (2017).

FUNCTIONS OF PRESCHOOLS AS PERCEIVED BY STUDENTS OF PRE-PRIMARY UNIVERSITY EDUCATION

Adriana Wiegerová¹ & Peter Gavora²

¹*Dep. of School Education, Faculty of Humanities, Tomas Bata University in Zlín (Czech Republic)*

²*Research Centre FHS, Faculty of Humanities, Tomas Bata University in Zlín (Czech Republic)*

Abstract

Conceptualisation of teaching by teachers is considered to be an important variable that affects the style of educational practices and this, in turn, behaviour to children. The conventionalisation is a developing phenomenon that evolves throughout the career of the teacher, and its roots can be detected already in the pre-service period. This research project concentrated on revealing the perception of functions of the pre-school by students of pre-primary university education. The project aims at answering the following questions: (1) how students of the pre-primary university programme view the current functions of the pre-school, and (2) how these functions are fulfilled in pre-school teachers' practices. The sample consisted of 22 pre-service students of pre-primary education in the Czech Republic. The qualitative design was based with gathering data on students from three sources: (1) thematic writing, (2) interviews, and (2) metaphor creation by students. It was found out that their position of the pre-school is between play-pedagogy and more structured activities that are directed and organized by teachers. Still in the pre-school, "instruction" does not take place. In contrast to primary schools, it is not compartmentalized, is not domain-separated, and the learning of children is rather unintentional. Institutionalisation of the child to the pre-school's rules of conduct and communication as well as their preparation for primary education were viewed as important goals of the pre-school. Overall, participants' views radically differed from conceptualisation of the pre-school as a protective institution. In contrast, educational rather than care functions dominated in the participants conceptualisations.

Key words: *Conception of education, preschool, social function, educational function*

1. Introduction

In the Czech Republic, as in many European countries, accredited and subsidized services are provided for education and care of young children. Educational institutions for children between 3-6 years of age (pre-schools) represent the first level in the hierarchy of the Czech educational system. The educational aims of pre-schools are clearly defined in the curriculum and are superior to the aims of the caregiver. The main aim of education of young children is stimulation of the cognitive, affective, sociocultural and psychomotor development. A strong emphasis is put on pre-reading, pre-writing and acquiring elementary mathematical concepts. Educators in pre-schools are required to have qualification based on specific pedagogical education in which practical and theoretical education is combined. The lowest qualification is graduation at the upper secondary pedagogical school. Many pre-school teachers, however, continued their education to attain the bachelor's degree at the university. In the Czech Republic there are increasing voices of experts which aim to support the qualification growth of the pre-school teachers by completing of the bachelor's university programme in pre-school education. The motivation of these voices is to better prepare teachers candidates for increasing demands of education of young children (Rabušicová, 2014).

Such programmes are offered in several universities across the Czech Republic. The programme provides the graduate with necessary professional competences that meet the requirements regarding pre-primary education in the Czech Republic and also European Union. The aim is to improve the high quality university training of future teachers of pre-primary schools that would meet the requirements of OECD and also strategic documents of educational policy of the Czech Republic. The graduates of the programme *Pedagogy for pre-primary educators* are equipped for the profession of a pre-primary school teacher and the teacher in specialized centres for pre-primary education. Graduates are capable of planning and implementing educational activities in the institutions for pre-primary education and in the

centres for leisure activities of pre-school children. They have the knowledge of cultural and social aspects of children's upbringing, and they are acquainted with basic psychological principles of upbringing and education of children. The bachelor study programme includes optional courses that provide additional knowledge and skills to enable the students to continue studying in the master's study programme.

2. Objectives

The aim of this study is to identify how students of the pre-primary university programme view the current functions of the pre-school and to find out how these functions are fulfilled in pre-school teachers practices. We shall refer to "view" as a specific conceptualisation of reality by individuals, which is highly subjective, i.e., it includes beliefs and attitudes and which was constructed as based on experiences, information and knowledge of the social world.

3. Methods

The design of this study is qualitative, and is rooted in the tradition of interpretivism. Three methods of data collection were used to receive complex answers on the research questions: thematic writing, semi-structured interview, and metaphor creation. The participants wrote thematic writing (Richardson, 1994; Elizaberth, 2007), framed by open questions concerning their views on the research topics. Semi-structured interviews were conducted to clarify some aspects of answers that were produced in thematic writing. Metaphors were created by the participants to provide additional aspects of their views.

Writings and interview transcripts were repeatedly re-read and then processed via systematic open coding. The results of the first stage of the analysis were encoded segments of texts and the list of codes. In the second stage of the analysis the codes were grouped into semantically unified segments, which were then named. In this way the themes emerged from thematic writing and from interviews. In the following stage we tested the relevance of the themes and their appearance in the text segments. Consequently we provided theoretical interpretation, which, in case of thematic writing, resulted in the analytical story. Then we provided comparative analysis of the interview and written metaphors for the selected themes. Basically the data were analysed following the principles of thematic analysis (Braun & Clarke, 2006).

The participants of the research were 22 students enrolled at the bachelor's study programme Pedagogy for pre-primary schools in the Zlín region, the Czech Republic. The students were women between 18-22 years. Half of the students graduated from upper secondary pedagogical schools before enrolling at the university and were qualified for teaching at pre-primary schools. Other students came to university from grammar or other secondary schools. Some students attempted to study at the university for the second or even third time. The time between the university study and graduating from secondary school they spent with working at pre-primary schools or in organizations that focused on educational activities for preschool children. Mostly they were various courses such as dancing, folk dancing, pottery workshops or singing. Most of the students had experience with package tours for preschool children during summer holidays. They either worked as camp leaders at summer camps or helped with organization of various activities, such as suburban summer camps. This means that all of them had experience with working with children.

4. Findings

Several relevant themes emerged from the data. There was much agreement among participants on what they view as the main tasks of pre-school teachers. First, they claimed that it is not "instruction", because instruction is the chief activity in the primary grades. Pre-school has strong potentials to add values to and enrich the upbringing of the child that takes place in the family, and in many cases even it compensates the family if it is dysfunctional. Also the participants expressed their beliefs that the task of the pre-school is to prepare the child for life – make it easier to live in the social world. This includes the preparation for attending the primary school, and especially to facilitate the school adaptation process. This preparation encompasses basic knowledge and skills that are needed for the child to successfully function in primary grades. To sum up, the participants conceptualized the pre-school as the institution that has three strong functions: (1) socialisation of the child, (2) assistance to the family in upbringing the child, (2) preparation of the child for adaptation to the primary grades.

Though participants admitted that one of the main functions of the pre-school is to prepare the child to attend the primary grades, they clearly identified the differences between these two institutions, which as one participant said “are huge”. While in the pre-school the learning is based on play, and is unintentional and the child is highly motivated to discover the world, the primary school was chiefly characterized as discipline-based and compartmentalized, i.e., the day is segmented to lessons that are devoted to school subjects. Pupils are seated at desks, with a specific seating arrangement. In other words, primary grades were conceptualized by participants as more structured - both chronologically and by activities which are domain-specific. Play-pedagogy (Fleer, 2006) more or less retreated from primary schools and was substituted by instruction.

Still the pre-school’s daily activities are not only free play. Though they are many of those that are spontaneous, there are also other in which the child is led by the teacher to a certain direction. These were referred to as coordinated activities. They are concentrated to reach the defined outcomes. Learning impact of these activities is much richer than those of free spontaneous play of children. The activities in the pre-schools are organized to segments, though they are not as strict as it is in primary grades compartmentalisation. The participants appreciated this regime of the organization because the child learns “order”, and “system” and it also brings them the feeling of safety and security in the pre-school. As one participant put it, the perception of daily “regime” in the pre-school teaches children what they will be used in the course of adult life, in job or at household. However, as another participant expressed, the prescribed regime of the day in the preschool is a highly convenient thing and she “would be depressed if it was not there; the regime helps both children and the teacher.”

Another theme that was communicated by the participants concerns the content and style of the pedagogical practices that the pre-school teacher currently uses. The basic principle is alternation of activities. The alternation and variability of contents is highly recommended: “You cannot do the same thing all day long... you have to promote the development of children in many areas.” Another theme which emerged in the data was the necessity to learn rules by children. Rules are important to bring order. As one participant expressed: “For me, the pre-school can be metaphorized as a bag of fleas. The majority of children are vivid, so it is important to install order. In the pre-school this is accomplished by setting up the daily regime and rules.” Or: “Pre-school is like an undirected missile. You never know what will happen and the children, like missiles, must be directed”. Apart from other activities, communication is one domain that the participants stressed to be rule-governed and therefore the children have to learn the rules of communication behaviour such as turn-taking rules, or signals like raising hands when asking to talk.

5. Conclusion

The data showed that students of pre-primary university education, that were our participants in this study, have well elaborated conceptualisation of the preschool as an educational institution. Their position of the pre-school is between play-pedagogy and more structured activities that are directed and organized by teachers. Still in the pre-school, “instruction” does not take place. In contrast to primary schools, it is not compartmentalized, is not domain-separated, and the learning of children is rather unintentional. Institutionalization of the child to the pre-school’s rules of conduct and communication as well as their preparation for primary education were viewed as important goals of the pre-school. Overall, participants’ views radically differed from conceptualisation of the pre-school as a protective institution. In contrast, educational rather than care functions dominated in the participants conceptualisations.

References

- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101.
- Elizabeth, V. (2007). Another string to our bow: Participant writing as research method. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 9(1), Art. 31. Retrieved Dec. 1, 2013, from <http://www.qualitative-research.net/index.php/fqs/article/view/331/723>
- Fleer, M. (2006). The cultural construction of child development: creating institutional and cultural intersubjectivity. *International Journal of Early Childhood Education*, 14, 127-140.
- Rabušicová, M. (2014). *Argumenty pro rozvoj a podporu předškolního vzdělání v Evropě*. Conference on Předškolní vzdělávání v teorii a praxi. Prague.
- Richardson, L. (1994). Writing as a method of inquiry. In N. K. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research* (s. 516–528). London: Sage.

THE VIRTUAL LEARNING ENVIRONMENT (MOODLE): A TOOL IN THE PROCESS OF THE TEACHING AND THE LEARNING

Marcia Helena Sauaia Guimarães Rostas

Mestrado Profissional em Educação e Tecnologia/Instituto Federal de Educação, Ciência e Tecnologia Sul-Rio-Grandense (Brasil)

Abstract

Nowadays, a change in the structure is happening in all the areas. In schools, as in other sectors of society, new spaces are being conquered. We think of school, the classroom, is a granted space. Considering the new technologies of information, arise the number of places that break the barriers of time and physical distance without, however, losing the quality of the processes involving teaching and learning. The virtual learning environment is a space that allows interaction between teacher, student and object of their knowledge in several ways. The virtual learning environment, which is the online classroom, represents a set of interfaces, tools and decisive structures for the construction of the interactivity and learning process. This text describes the experience of working in a virtual learning environment with 40 students in a Postgraduate Education Course (distance mode course) of the Instituto Federal de Educação Sul-Rio-Grandense - in the city of Pelotas, Rio Grande do Sul - Brazil - in the year of 2014. The study aimed to discuss the use of the communication tools within the Virtual Learning Environment (Moodle) through interaction in the forums of discussion proposed by teachers during the offered subjects. The methodology used was the case study and the data collection was performed through Moodle, registering the systematical reflections of students. Data analysis was performed by means of discourse textual analysis. The observations also involved the number of replicas that each post, on a particular topic proposed by the teacher, led to. It was observed that the incidence of posts answering the classmates thoughts/ideas, only occurred when there was teacher interference, encouraging the student to interact, proving that learning is a continuous construction process. It was also highlighted in this research, that the preparation of the teacher for the use of new technologies is essential to the effectiveness of these new environments.

Keywords: *Distance learning; learning environment; teaching; learning*

1. Introduction

We started this article stressing the thought of Alarcão (2005), which is based on the idea that we inserted in an open and global society called, "information society". Within this spaces the various digital media available exert great power and influence among people, besides being impregnated with values and intentions. The author, also detaches that this setting is not configured harmonically, in contrast, it occurs in a "[...] complex, full of contradictory signals, immersed by canals and torrents of information in an offer of serve of myself whoever needs, whatever is needed, and make use of myself the way you wish" (2005, p. 13).

Considering this scenario, we highlight the need to develop new skills that encourage the access, the evaluation and the information management. Not to know how to deal with the excess data and information which surround us every day, might cause serious problems on the simplest communication processes.

Inside the school environment, is no different. The teacher must reconsider his/her relationship with the students, making it stronger. In this cycle the communicative competence needs to be developed so that both dominate not only similar language codes, but understand, make use of it, and discuss about the data originated from mutual experiences in a universe that is transformed and build.

Analyze the complexity of the social context is an important indicator for understanding the different dilemmas faced by education, since what happens in the society has a direct impact on the school and, as a result, what happens in the school reflects in the society. Therefore, in this study, we

argue that current learning requires developing the capacity to discern, to question and to reflect on the information received to get in the knowledge.

2. Moodle and the experience of Graduate Education in IFSUL

The virtual learning environment, which is the online classroom, is a set of interfaces, tools and decisive structures for the construction of interactivity and learning. Significantly, the Virtual Learning Environment (VLE) favors interactivity and opens the webs of connection that form the web of relationships (Smith, 2006).

This type of environment is based on the concept of interactivity, which involves co-operation, two-way dialogue and participation presupposes a dialogue, knowledge about the hypertext, open to connections, the integration of various languages (sound, text, images) and to broach education as “um sistema aberto, com mecanismos de participação e descentralização flexíveis, com regras de controle discutidas pela comunidade e decisões tomadas por grupos interdisciplinares” (Silva, 2006, p.9).

The virtual learning environment used and also described here is the Moodle. Besides being free and open source, Moodle allows its environment to be modeled to suit the needs and the design of each institution. It has interfaces for synchronous and asynchronous interaction between participants of the teaching-learning process and it is based on a paradigm of collaborative learning. Despite offering resources to an innovative pedagogical approach, it will depend on the attitude of the school, the teacher and their conceptions of teaching and learning, as will be discussed below.

This text describes the experience of working in a virtual learning environment with 40 students in a postgraduation course in education (distance mode) of the Instituto Federal de Educação Sul-Rio-Grandense - in the city of Pelotas, state of Rio Grande do Sul - Brazil - in the year of 2014. The study aimed to discuss the use of communication tools within the Virtual Learning Environment (Moodle) through interaction in the forums of discussion proposed by teachers during the offered subjects. The methodology used was the case study and data collection was performed using the Moodle and the systematically collecting the registered students reflections. Data analysis was performed by means of discourse textual analysis. The observations also involved, the number of replicas that each post on a particular topic proposed by the teacher received. We observed that the incidence of posts in response to the classmates thoughts/ideas, only occurred when there was teacher interference, encouraging the student to interact, proving that learning is a continuous construction process. We stressed, in this research, that the preparation of the teacher for the use of new technologies is essential to the effectiveness of these new environments.

Figure 1. Example of a Discussion Forum



In the example above it is possible to check the students' interaction and the importance of the teacher in this process. The interaction of the teacher is vital to provide continuity in this process that involves teaching, learning and interaction through the language.

In the following example, we verified the possibility of interaction between students. The construction of the discourse between the classmates, which contributes both, to the intellectual and social growth of the student. It is important to underline that although this kind of education is called "distance", this only occurs inside a physical environment, since the whole process developed between teachers and students takes place in a real way.

Figure 2. Construction of the Discussion Forum



3. Conclusion

Moran (2006), when delineate the educator profile, argues that, with the online education, the teacher's roles are multiplied, recruiting great adaptability and creativity in face of new situations, proposals and activities. Thus, the teacher must learn how to work with different types of technologies and ensure a more participatory vision of the educational process: encourage the creation of communities, research in small groups, the individual and collective participation.

Moreover, Silva (2006) emphasizes that the teacher should be a network, not a route builder. Someone who is able to determine a set of territories to explore and that allows the student to be an author of his/her own experience. As the one who has the webs, the teacher would allow the student involvement, stimulating intervention as co-authors of their learning. In addition, more than teaching, the teacher should lead the student to learn through the creation, management and regulation of the learning situations, project development, problem solving, and individual and collective reflection. Participating in this process, the student has the possibility of achieving a more effective learning.

This path, described by Moran (2006) and Silva (2006), was observed in the proposed activities and in the effectiveness of learning report. The interaction between teacher and student, student and student, student and tutor, tutor and teacher is crucial for the success of the proposed activities in Moodle.

References

- Alarcão, Isabel. *Professores reflexivos em uma escola reflexiva*. 4.ed. São Paulo: Cortez. (Coleção Questões da Nossa Época; 103), 2005.
- Moran, J. M. (org.). *Integração das tecnologias na educação: salto para o futuro*. Brasília: Ministério da educação, p.62-9, 2005.
- Silva, M. (org.). *Educação on-line: teorias, práticas, legislação e formação corporativa*. 2.ed. São Paulo: Loyola, 2006

SURVEY ON SOCIAL NETWORKS USE IN THE TEACHING-LEARNING PROCESS AND ITS CORRELATION WITH STUDENTS SOCIOECONOMIC STATUS IN TWO PUBLIC HIGHER-EDUCATION INSTITUTIONS IN MÉXICO

Pedro Moreno-Badajós¹, Antonio Ponce-Rojo² & Jorge Hernandez Contreras¹

¹ *University Center of Lagos, University of Guadalajara (México)*

² *University Center of Social Science and Humanities, University of Guadalajara (México)*

Abstract

In this survey, we study the frequency on use of social networks for academic activities and their relationship with the user's socioeconomic status. The measurement was performed at a single moment, in the summer of 2014, in an unrepresentative sample of 340 students in two of the most important public education institutions in Mexico. After analyzing the results, we identified that there is a frequent use of social networks in the daily life of students, but only a few use of these in their scholar activities. The total of the sample use social networks, most commonly Facebook, YouTube, Google+, Twitter and Instagram. Only some of these networks are used in academic activities such as Facebook, YouTube, Google+, Slide Share while others like Twitter, and Instagram, although popular in everyday life, are not involved in educational activities. We didn't find a significant correlation between socioeconomic status and the use of social networks in educational activities, however it was found that there may be a influence in the use of some social networks by their peers and teachers

Keywords: *New Technology & education, Socioeconomic Status, social network & education, Web 2.0 & higher education.*

1. Introduction

In the current context, the students of public institutions of higher education in Mexico used with higher frequency the social networks in their common life and the professors begin to implement these tools to improve the educational process. In the survey, the types of social networks involved in the educational process and their frequency of use was identified from a non-representative sample of college students from two Public Higher Education Institutions in Mexico, the University of Guadalajara (UdeG) and the Autonomous University of Nayarit (AUN), as well as the probable correlation with the socioeconomic status of the users.

2. Social Networks Usage within the scholar activities, its current scene in Mexico

An internet social network makes reference to online network platforms with open systems and in permanent construction where people are grouped together, connected by one or several types of relationships and issues and whom get organized to strengthen their resources. Therein these networks, services such as entertainment, friendship building or maintenance, among others, can be provided as well as other types of relationships mainly used for these purposes, measured by technological platforms that make interaction of social nature possible (Brito, Laaser, & Toloza, 2012; 2010; Morduchowicz, Marcon, & Sylvestre, 2013; Ponce, Hernandez, Moreno, 2010). In accordance with the Mexican Internet Association (Segui, 2013), the most used social networks by Mexicans are those of an horizontal type, by order of usage: 1 Facebook; 2 YouTube; 3 Twitter; 4 Google+; 5 Hi5.

In the scholar context, Gamboa (2010), mentions that the incorporation of Information and Communication Technologies (ICT) necessarily implies a pedagogic paradigm change. It requires the transition from an educational model centered on teaching to an educational model that revolves around learning. Social networks and, in general, the Web 2.0 tools can be considered as a learning strategy because they would have the role of facilitating information and means for integration and communication; students would voluntarily access them and they would give an added value to their

learning processes (Islas Torres & Carranza Alcántar, 2012). About it Cobo and Pardo (2007) cited by Amat, F et al. (Amat, 2011) point out four learning forms that this new environment allows, the same that support the relevance of this study: Learning-by-doing; Learning-by-interacting; Learning-by-searching; Learning-by-sharing.

3. Socioeconomic Status and the Usage of Internet Social Networks

For this survey, the socioeconomic status (SES) definition used by the Mexican Association of Market Research and Public Opinion AC (AMAI) would be used, which defines it as “the most used classification to discriminate the social, political and products and media consuming behaviors” (Lopez Romo, Amari, & Investigaciones Sociales, 2011) of people and therefore they analyze four main concepts or variables: Social class, Lifestyle, Income and Welfare. In this rank AB is the top category and E is the lowest socioeconomic status. About the profile and SES status of social networks users in Mexico, Consulta Mitofsky conducted an interesting study during 2011 (Campos, 2011) in which an analysis is presented, this analysis allows us to identify some differences in-between the profiles of the users of two of the most popular social networks of the country: Facebook and Twitter.

Table 1. Usage of Facebook and Twitter by Socioeconomic Status in Mexico

SES	Facebook User		Twitter User	
	YES	NO	YES	NO
A/B/C+	42.2	8.7	49.3	13.1
C/D+	51.5	56.8	44.1	57.2
D/E	6.3	34.5	6.6	29.7

4. Methods

The measurement was performed at a single moment, in the summer of 2014, in an unrepresentative sample of 202 students of the University of Guadalajara and 132 of the Autonomous University of Nayarit). An electronic survey was applied to identify the type and frequency of use of social networks both for educational purposes and daily life use, as well as an adaptation of the survey AMAI NSE 8X, used commonly in marketing to identify the socioeconomic level of the Mexican population.

5. Results

In the 340 of the applied surveys it was registered that 99% of students use social networks in their everyday life, being Facebook the most popular network with a 99%, followed by YouTube with an 83%, Google+ with a 60% and Twitter and Instagram with a 32%. The popularity in the usage of social networks in scholar activities is proportional to their everyday usage, being once again Facebook the most used one in a 99% of the sample, followed one more time by YouTube with the 62%, Google+ with 52% and SlideShare with an 11%. (Table 2).

The scholar usage of social networks is aimed mainly to maintain communication with professors and classmates, these are also the ones which have influenced the usage of these tools or school purposes (Table 3, 4).

Table 3. Scholar use of Social Network

To maintain communication with classmates and professors.	77%
To communicate with classmates about school works.	92%
To create a group to share homeworks with the teacher.	68%
To ask for information and have school procedures done.	56%
To share school products.	26%
Other	2%

Table 2. Use of social networks

Social Network	% Use in social life	% Use in learning
Facebook	99%	99%
YouTube	83%	62%
Google+	60%	49%
Twitter	32%	8%
Instagram	22%	1%
MySpace	11%	3%
SlideShare	11%	11%
Tumblr	9%	4%
LinkedIn	6%	1%
SoundCloud	6%	1%
Badoo	5%	0%
Hi5	4%	0%
Pinterest	2%	1%
Flickr	2%	1%
Tuenti	1%	0%
Other	5%	7%

Table 4. Influences in use of Social Network in Learning activities

Classmates	75%
Friends	70%
Professors	48%
Relatives	18%
Communication Media	8%
Advertising on Internet	3%

The most used devices to check social networks are Laptops with a 71%, cellphones with a 65%, displacing desktops with a 32% (Table 5).

Finally, the tests applied to obtain the correlation coefficients, between the number of social networks used in learning and SES, showed that the correlation coefficients were very low (0.00568), thus it is determined that it does not exist a significant correlation between them, following on table 6 the distribution is showed.

Table 5. Used Devices

Device	%
Laptop	71%
Cellphone	65%
Desktop	32%
Tablet	25%
Game consoles	4%

Table 6. Distribution by SES and % in uses of social networks

Frequencies of SES in the sample		% of use social Network y education activities by SES					
SES Level	%	FaceBook	YouTube	Google +	Slide-Share	Twitter	My Space
AB	7%	100%	64%	45%	9%	9%	0%
C+	19%	100%	58%	45%	13%	6%	3%
C	21%	100%	53%	32%	12%	21%	6%
C-	13%	100%	59%	36%	5%	0%	9%
D+	21%	100%	74%	55%	21%	9%	0%
D	18%	100%	72%	52%	0%	3%	0%
E	2%	100%	67%	57%	0%	0%	0%

6. Conclusion

After analyzing the results of the survey we identified that there is frequent use of social networks in the daily life of students, but they only use a few of these in their scholar activities. Also, we did not find a significant correlation in the use of the social networks and their socioeconomic status. The total of the sample use social networks, the most common were Facebook, YouTube, Google+ and Twitter. Only some these networks are used in academic activities such as Facebook, YouTube, Google+, while others like Twitter, Hi5 and Instagram, although popular in everyday life, are not involved in educational activities. The influence on the use of social networks in educational activities is determined by other students, friends and teachers, such networks are frequently used to establish communication about homework with peers and teachers, likewise for creating groups. One of the most used tools is the chat. We found an increase in the presence of mobile connection devices like phones, tablets and laptops displacing desktop computers. We didn't find a significant correlation between student's socioeconomic status and the use of social networks in educational activities, however it was found that there may be an influence in the use of some social networks by their peers and teachers

References

- Amat, F. (2011). Usando la web 2.0 para informarse e informar una experiencia en educación superior. *Teoría de la Educación Educación y Cultura en la Sociedad de la Información*, 12(1), 145-166. Retrieved May 07, 2014, From: <http://www.redalyc.org/articulo.oa?id=201021400008>
- Brito, J. G., Laaser, W., & Toloza, E. A. (2012). El uso de redes sociales por parte de las universidades a nivel institucional: Un estudio comparativo. *RED Revista de Educación a Distancia* 32, 1-38. Retrieved July 10, 2014, From: <http://www.redalyc.org/pdf/547/54724591006.pdf>
- Campos, R. (2011). Perfil de usuarios de redes sociales en internet. *Tracking Poll Roy Campos*, 52, 1-10. Retrieved June 15, 2014, From: http://consulta.mx/index.php/estudios-e-investigaciones/los-numeros-no-mienten/item/download/159_7eed4879904ee26b292f0d840a6cec74
- Gamboa, M. A. (2010). Equidad tecnológica en la educación básica: criterios y recomendaciones para la apropiación de las tic en las escuelas públicas. *Reencuentro*(59), 24-32. Retrieved April 20, 2014, From: Retrieved July 10, 2014, From: <http://www.redalyc.org/pdf/547/54724591006.pdf>
- Lopez Romo, H., Amaí, C. N. S. E., & Investigaciones Sociales, I. (2011). Actualización Regla AMAI NSE 8X7 Congreso AMAI 2011 (pp. 37-37). Retrieved May 07, 2014, From: http://www.amai.org/NSE/PRESENTACION_REGLA_8X7.pdf
- Morduchowicz, R., Marcon, A., & Sylvestre, V. (2013). *Los adolescentes y las redes sociales*. Argentina. Retrieved May 07, 2014, from: <http://es.slideshare.net/gcucuzza/los-adolescentes-y-las-redes-sociales>
- Ponce, A., Hernandez, J., Moreno, P., Badajos. (2010). Universidad 2.0: El uso de las herramientas más comunes de la nueva generación de internet social en la educación presencial universitaria en México. *Dialogos Sobre Educación*, 1(1), pp. 1-33, 2010. Retrieved May 07, 2014, From: <http://www.publicaciones.cucsh.udg.mx/ppperiod/dialogos/pdf/4.pdf>
- Segui, J. (2013). Crecimiento de las redes sociales en America Latina. Retrieved 04/07/2013, From: <http://es.slideshare.net/pllanos/latin-america-social-networking-study-2011-final-spanish>

MOBILE LEARNING IN HONG KONG TEACHER EDUCATION: STUDENTS' LEVEL OF READINESS AND RECEPTIVITY

Irene C.M. Lam, Chi HoYeung & Yau Yuen Yeung

Department of Science and Environmental Studies, Hong Kong Institute of Education (China)

Abstract

To align with international trend on using information and communications in education, the Hong Kong government has recently announced a policy to broadly implement e-learning in schools through a more pervasive use of mobile devices (like smart phones and tablets) and electronic textbooks to support classroom teaching and students' self-regulated learning. However, many local schools and their teachers are not yet ready and confident enough (in terms of their teaching methods, strategies and approaches) to adopt mobile devices in their classroom activities. A team of teacher educators has then initiated an e-learning project which aims to go far beyond the elementary practice of "Bring Your Own Devices" and take a pioneer's role to help the education sector by offering relevant training to our pre-service student-teachers and in-service teachers. To achieve that important educational goal, we designed and applied new e-learning activities in two different classes of undergraduate teacher education courses. The activities included (1) using simulation and developing Android apps to help pupils learn science and (2) applying the Arduino open-source microcontroller platform with appropriate programming skills to simulate a traffic light system. A research instrument, which was consisted of Likert questions and open-ended questions, was administered to collect information from a total of 144 undergraduate students on their prior experiences, attitudes and views on mobile learning and to evaluate their learning effectiveness in those technology-enhanced lessons. Interesting qualitative and quantitative findings will be presented in the poster together with concrete examples of classroom e-learning activities.

Keywords: *Mobile learning, e-learning, teacher education, higher education, Hong Kong*

1. Introduction

The use of mobile technology to enhance students' learning (also known as technology-enhanced learning) is drawing more attention and interest in educational research (Attewell & Savill-Smith, 2004; Peng, Su, Chou & Tsai, 2009; Wang, Wu, & Wang, 2009) due to the widespread usage of different mobile devices like smart phones and tablets in many teenager's daily-life for communication, web surfing, social networking, video/photo-taking and entertainment (e.g. playing electronic or online games, listening to music and songs and watching TV, videos or movies). The term called mobile learning (or m-learning) has been cloned to describe any learning taking place with learners who are using mobile computational devices (including personal data assistant and pocket PC) (Peng, Su, Chou & Tsai, 2009). The advantages of m-learning are well-known not only for enabling self-regulated and collaborative learning activities between learners at anytime and anywhere (Attewell & Savill-Smith, 2004) but for facilitating paradigm shifts in education, e.g. spatial shift (campus-based to home-based learning), curricular shift (national/fixed curricula to personal curricula), and shift in teacher's role (knowledge provider to facilitator of learning) (Desai, Hart & Richards, 2008).

In 2014, the Hong Kong government has announced a policy (with the release a new policy document for consultation on the fourth strategy on information technology in education) to broadly implement e-learning in schools through a more pervasive use of mobile devices and electronic textbooks to support classroom teaching and students' self-regulated learning. However, many local schools and their teachers are not yet ready and confident enough (in terms of their teaching methods, strategies and approaches) to adopt mobile devices in their classroom activities. In teacher education, the past teaching methods and educational research (see, e.g. Seppala & Alamaki) have focused on the elementary use of mobile devices for communication (discussion, sharing of photos or other materials, short message service etc) and there are in fact many challenges and barriers such as fragmentation of learning time, high cost of mobile devices and connectivity service and the abuse of the devices (and disturbance of lessons) for personal calls and other non-educational purpose (see, e.g. Denk, Weber & Belfin, 2007).

identified for further research and development before the potentials of mobile learning could be fully utilized for educational purpose. Being the largest teacher education institution in Hong Kong, we have started to incorporate an array of different teaching and learning activities in some of our programmes to enrich students' learning experiences and empower their capacity in the use of mobile learning. Two cases of our approaches are reported below together with the relevant evaluation on the students' perceived learning effectiveness as well as their prior experiences, attitudes and views on mobile learning.

2. Methodology

Some innovative e-learning activities were newly developed adopted in a 3-hour lesson of two undergraduate courses, A and B, by two lecturing staff, each with two repeated classes. The course A was for developing student-teachers' teaching methods or pedagogies in which participants were first arranged to play some apps or courseware on simulation experiments in typical school science topics, e.g. photosynthesis in biology and water rocket in physics (force and motion). Then, they were taught how to develop apps by themselves using an online app-building tool called App Inventor 2 provided by MIT (see <http://ai2.appinventor.mit.edu/>) of which the objective was to equip participants with the capability to develop apps (or modifying those open-source apps) of some simple simulation experiments or activities for their future pupils in schools. The second course B was for students of non-science major to learn subject knowledge in science and technology and their linkage with the society. The newly incorporated lesson was on the application of digital technology in our daily-life in which students were taught how to apply the Arduino open-source microcontroller platform (see <http://arduino.cc/>) with wiring of simple circuits (involving some basic electronic components like LED and resistors) and appropriate programming skills to simulate a traffic light system. After the lesson, a self-developed and validated questionnaire was administered to the four classes of participants (a total of 169) on a voluntary basis. Apart from the personal particulars, the questionnaire (see Tables 1 and 2) consists of four parts, namely (1) ten items on respondents' prior learning experience with mobile devices, (2) five items on respondents' attitudes and views on mobile learning, (3) five items on the evaluation of respondents' e-learning experience in the lesson, and (4) four open-ended questions to collect respondents' opinions and feedback on the problems of using mobile devices for e-learning, reasons for their most interesting activities, ways for improvement and other comments.

3. Findings

From the questionnaire survey of four classes of students in two courses, 144 questionnaires (with 61 and 83 from course A and B, respectively) were collected with an overall return rate of around 85%. The mean score of all items with each part and standard deviation (SD) were given in Table 1 while the qualitative data collected from the open-ended questions were summarized in Table 2.

Table 1. Consolidated results of the Likert items in the survey

Part	Content/Aspect	Scale	Mean (SD)	Cronbach's Reliability α
1	Prior learning experience with mobile devices,	4-point Likert scale (with 1=rarely .. 4=frequently)	2.9 (0.5)	0.81
2	Attitudes and views on mobile learning	5-point Likert scale (with 1=strongly disagree, 2=agree, 3=neutral, 4=agree and 5=strongly agree)	3.6 (0.6)	0.84
3	Evaluation of e-learning experience in the lesson		3.5 (0.6)	0.90

Table 2. Consolidated results of the open-ended questions in the survey

Question Aspect	Category	Opinions or feedback
Reasons for most interesting activities	Programming	<ul style="list-style-type: none"> Excited with first-time experience in programming Useful aid for teaching purpose
	Playing simulation apps	<ul style="list-style-type: none"> Can link up the scientific principle with technological product Simulation was well illustrated Step-by-step demonstration
Problems on e-learning	Instruction	<ul style="list-style-type: none"> Limited time Students cannot follow the pace Limited teaching aids/equipment (i.e. tablets) Not every student can participate Learning objectives unclear to students
	Programming	<ul style="list-style-type: none"> Not experienced users Unable to connect the Arduino board with the computer

	Hardware	<ul style="list-style-type: none"> • Unfamiliar with the tablet's Android-based operating system and interface • Malfunctioning of the circuit board and the electronic components
Improvement or solution to problems	Instruction	<ul style="list-style-type: none"> • Give enough time for students to try • Ask helpers/teaching assistants to provide support and follow the progress of each group of students • Provide more equipment • Assign students responsible for specific tasks • Clearly state the learning objective before starting the activities
	Programming	<ul style="list-style-type: none"> • Provide relevant background materials to students for self-learning prior the lesson • Provide a clear list of problems which may occur in connecting the Arduino board with the computer
	Hardware	<ul style="list-style-type: none"> • Adapt the teaching materials or apps to mobile devices of other brands.

4. Discussion and Conclusions

With a high reliability $\alpha > 0.8$ for findings in Table 1, students had fairly good prior experience and held positive attitudes and views on mobile learning even though most of them did not take information technology as their major or minor. Our questionnaire instrument has also collected students' personal information to indicate that nearly all of them possessed a smart phone and nearly a half of them had a tablet. Coupled with the fact of 100% Wi Fi coverage within the campus, we concluded that the undergraduates are quite ready with high level of acceptance for widespread adoption of mobile learning in their teacher training programmes. Those findings will be compared with other university students enrolled in other types of undergraduate programmes (Park, Nam & Cha, 2012) and undergone further analysis to uncover the underlying factors for their acceptance (Wang, Wu & Wang, 2009; Abu-Al-Aish & Love, 2013). However, the findings on students' evaluation of e-learning experience for a single lesson should be noted with care as students need to get exposed to the new teaching activities for more lessons before achieving any educationally significant changes. Nevertheless, the students' identification of learning problems and feedback are useful for future refinement and improvement of the e-learning activities and teaching approaches. In fact, students had shown greater level of engagement and collaboration in their learning process and joy and happiness for their successful completion of the tasks.

Acknowledgement

Financial support from the Hong Kong Institute of Education is gratefully acknowledged. Thanks are also due to the research assistants, student helpers and students concerned for their help and participation in this project.

References

- Abu-Al-Aish, A., & Love, S. (2013). Factors Influencing Students' Acceptance of M-Learning: An Investigation in Higher Education. *The international review of research in open and distance learning*, 14(5), 82-107.
- Attewell, J., & Savill-Smith, C. (Eds.) (2004). *Mobile learning anytime everywhere: A book of papers from MLEARN 2004*. UK: Learning and Skills Development Agency.
- Denk, M., Weber, M., & Belfin, R. (2007). Mobile Learning-Challenges and potentials. *International Journal of Mobile and Organisation*, 1(2), 122-139.
- Desai, M.S., Hart, J., & Richards, T.C. (2008). E-learning: Paradigm shift in education. *Education*, 129(2), 327-334.
- Park, S.Y., Nam, M.W., & Cha, S.B. (2012). University students' behavioral intention to use mobile learning: Evaluating the technology acceptance model. *British Journal of Educational Technology*, 43(4), 592-605.
- Peng, H.Y., Su, Y.J., Chou, C., & Tsai, C.C. (2009). Ubiquitous knowledge construction: mobile learning redefined and a conceptual framework. *Innovations in Education and Teaching International*, 46(2), 171-183.
- Seppala, P., & Alamaki, H. (2003). Mobile learning in teacher training. *Journal of Computer Assisted Learning*, 19(3), 330-335.
- Wang, Y., Wu, M., & Wang, H. (2009). Investigating the determinants and age and gender differences in the acceptance of mobile learning. *British Journal of Educational Technology*, 40(1), 92-118.

LIFELONG LEARNER GROWTH: IN WHAT WAYS DOES COLLEGE INSTRUCTION HELP AND HINDER?

Katherine C. Chen¹, Roberta J. Herter² & Jonathan D. Stolk³

¹*Materials Engineering Department, California Polytechnic State University, San Luis Obispo (USA)*

²*School of Education, California Polytechnic State University, San Luis Obispo (USA)*

³*Olin College of Engineering (USA)*

Abstract

A capacity for lifelong and self-directed learning (SDL) is now widely recognized as a critical outcome for today's college graduates; yet the processes by which learners *become* self-directed, and the roles that college experiences play in these processes, remain unclear. To effectively design curricula that support students' emergence as empowered, adaptive learners, instructors need more insight into how individuals transform from teacher-controlled to self-directed learners. To better understand this transformation, we conducted a mixed-methods study of undergraduate engineering students at two institutions. Quantitative results revealed that students at both institutions consistently reported autonomous motivations, positive beliefs about learning, and an emphasis on learning over grades – encouraging indicators of lifelong learning. The quantitative results did not, however, show many positive temporal shifts in SDL skills or attitudes over a two-year period. Qualitative data from open-ended questions and focus groups revealed the diverse ways in which students conceptualize and manage achievement goals, autonomous vs. structured tasks, challenges and failures, and personal and professional identity building. The findings provide insights into the types of learning experiences that trigger growth in the capacity for SDL, and raise questions about how college programs might better support lifelong learner development.

Keywords: *Lifelong learning, self-directed learning, autonomy, reflection, metacognitive process*

1. Introduction

In the United States, a larger percentage of engineering students enter college right after high school, having navigated the primary education system that is often teacher-controlled. By the time they complete college, however, students are expected to emerge as fully independent learners. A capacity for lifelong and self-directed learning (SDL) is now widely recognized as a critical outcome for today's graduates. Prior educational research has elucidated what it means for individuals to be self-motivated, self-regulating, and self-determined, yet the processes by which teacher-controlled learners *become* self-directed learners, and the roles that college learning experiences play in these processes, remain unclear. In order to effectively design curricula that support students' emergence as empowered, adaptive learners, instructors need to gain more insight into how individuals transform from teacher-controlled to self-directed learners. This paper examines the role of instructors and the instructional choices that affect student motivation, confidence, and capacity for self-directed learning. Guided by extant theoretical and empirical research on motivation and self-regulated learning (e.g., Deci & Ryan, 2000; Pintrich, 2004), we analyzed the reactions and reflections of students who experienced student-directed learning opportunities in their programs.

2. Methods

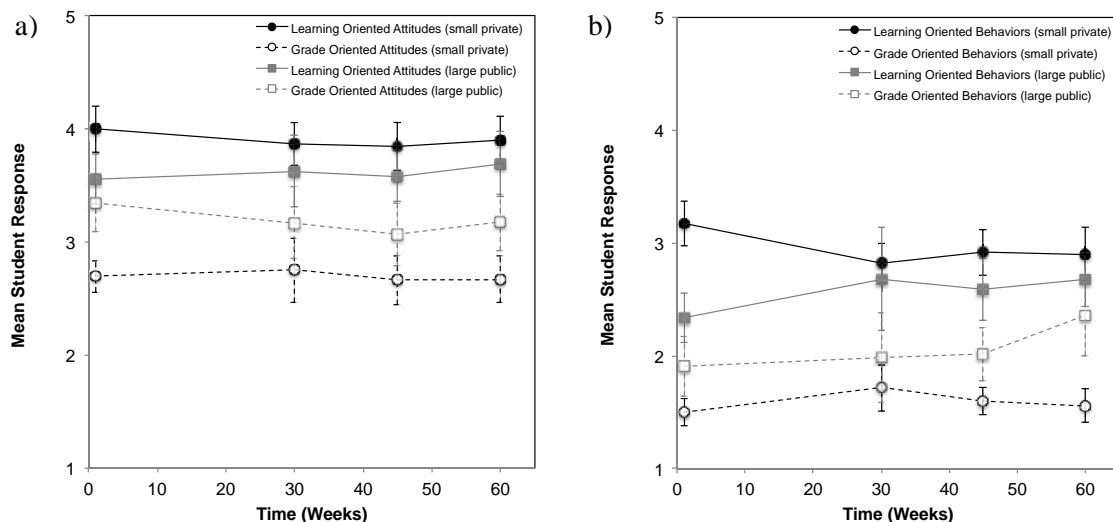
A mixed-method approach was employed to investigate the development of self-directed learning (SDL) of entering college students over time. The Learning Orientation Grade Orientation (LOGO II) survey was administered multiple times over a period of three years to two cohorts of engineering students, one at a small private engineering college and another in a single engineering program at a large public university. In addition, qualitative measures were employed in the form of open-ended written surveys and semi-structured focus groups. The focus groups were comprised of a core set of approximately 12 students who were active participants in the study.

Focus group discussions enabled consideration of how individuals perceived learning experiences, understood the roles of people and curriculum in their learning, and developed professional identities and career paths over time. Focus groups provided insight on how students engaged with peers and faculty, and curricula; and they revealed a complex array of factors that influenced students' paths to becoming engineers, including studying approaches, skill attainment, team participation, project planning, and internship seeking. The ongoing processes of self-assessment and reflection revealed how individuals conceptualized SDL, when they practiced it, and what and who impeded or supported its practice in relation to their academic, career, and life goals (King and Kitchener, 1994).

3. Discussion

The quantitative LOGO-II survey results (Figure 1) revealed that students emphasize learning goals over grade-based performance goals throughout their first two years of college, a result that serves as an encouraging indicator of self-directed learning potential (Stolk et al., 2014). The LOGO-II results did not, however, reveal many significant positive temporal shifts in SDL skills or attitudes over the two-year period. The lack of temporal change in learning and grade orientation raises important questions about the efficacy of early college experiences in promoting self-directed learner growth – questions that we explored via qualitative focus group discussions with study participants.

Figure 1. a) Learning Oriented and Grade Oriented attitudes and b) Learning Oriented and Grade Oriented behaviors over time for engineering students at two different institutions⁴. Error bars show 95% CI.



In contrast to the temporally-stable quantitative results, the qualitative measures revealed the diverse ways in which students conceptualize and manage achievement goals, autonomous vs. structured tasks, challenges and failures, and personal and professional identity building (Chen et al., 2015). Student voices and individualized experiences were captured such that we, as educators, gained insight into what types of instruction helped or hindered student learning. By capturing and categorizing indicators of helping or hindering, students provided instructors with the guidance needed to rethink timely interventions and opportunities for reflection. The complex interaction of instructor-led teaching with the goal of student autonomy requires a break in the cycle of co-dependence that students recognize when they fall into grade seeking behaviors, and when instruction encourages a fear of failure. Building tolerances for risk-taking, self-assessing, and help-seeking are behaviors students demonstrated in internship settings, but did not necessarily bring to classrooms. The difference points to ways that the same students respond with more or less self-direction depending on the learning environment.

Given autonomy in project choice or open-ended assignments, students discover internal motivation for learning and find meaning. In the words of one 3rd year student, *Having a lot of open ended assignments has allowed me to try and figure out what my own interests are and give meaning to the information I do find rather than feeling like I need to learn the materials solely because the teacher says I should.* Clearly, this student is using autonomy to trigger intrinsic motivations and self-regulated learning strategies. As we examined our teaching and learning environments along a continuum of experiences more or less responsive to students, we recognized the industry/factory model for education at one end that constrained students' search for autonomy as goals and methods were predictable and pre-set. In contrast, we began to imagine a different pedagogy, more responsive with opportunities for

reciprocation in planning, developing, and executing projects that include student input. Students see openings for authentic interaction with instructors who take on coaching roles that allow for more individualized instruction. For example, one 3rd year student described SDL experiences as, *I kind of feel like self directed learning is like you're being given a piece of paper, and you have to make it into a paper airplane and get it to the target. You're the one throwing the airplane and making it, but the teachers or coaches, as they call themselves sometimes, are kind of like the wind that directs the plane in the right direction.* As their time in various classrooms and familiarity with instructional choices become clear, students shift their *general expectations* for the professor role, and they also shift their *situational expectations* for specific instructors. They began to differentiate between instructors who valued and offered experiences in SDL, and those who followed a more traditional professor-led, instructor-centered model. Students reported making intentional choices based upon their own goals and preferences.

When assessing the development of SDL, it might be useful to approach the process informally and formatively with the goal of using assessment to guide instructional choices. Assessment practices that are exclusively terminal and formal (e.g., exam grades) exclude the rich possibilities that might be used to rethink and reteach when students seeking help find their projects in need of support. Shifting from final product (report, presentation, product) to process (goal setting, managing, reflection, strategy seeking) assessments, provides the necessary scaffolding for students to acquire the independence and confidence in their attainment of autonomy and self-direction. While acquiring SDL may take transformative teaching, transformations do not occur spontaneously or without nurturing or modeling desired behaviors. The level of self-direction, however, needs to be moderated by the instructor. Curricular choices about SDL exist along a continuum, and instructors can design autonomous vs. structured learning tasks in light of students' needs, prior experiences, skills, and the course goals. Pushing inexperienced students too far or too quickly toward autonomy can result in frustration and disengagement, rather than the building of positive SDL skills and attitudes. In the words of a 4th year student, *...a lot of self-directed learning [is] structured ...like due dates when things need to get done, but how you go about accomplishing that is completely up to you. So there's structure and no structure...a nice balance.* The ideal SDL environment achieves this autonomy-structure balance, from the viewpoint of both instructor and student.

4. Conclusions

This four-year study of SDL growth of engineering students revealed the importance and value of seeking out student voices. Quantitative surveys demonstrated that students are poised for lifelong learning, and qualitative measurements uncovered nuanced interactions among students, instructors, assignments, and goals. The conditions for self-directed learning entail student autonomy with instructor guidance at the appropriate times, as described by a 4th year engineering student: *I think we've slowly reached a maturity level where we understand what we want to learn, and we understand what we need to learn, and where we want to go in life, and paths we need to take in order to get there.* Students and instructors experience the intersections of helping and hindering as teaching and learning become mirrored practices. In observing students' struggles and successes, instructors see the reflection of their pedagogical choices. In seeking autonomy on their way to self-directed learning, students encounter instruction that helps as parts of a curriculum, or teachers and tasks that hinder. Acknowledging when and how hindrances occur depends as much on a reflective instructor, as when reflective students acquire the capacity to know what helps them.

References

- Chen, K., Herter, R., and Stolk, J. (2015) Moving from Quantitative to Qualitative Analysis to Capture the Development of Self-Directed Learning for a Cohort of Engineering Students. *Proceedings of the Annual American Society of Engineering Education Conference.*
- Deci, E.L. and Ryan, R.M. (2000) The 'What' and 'Why' of Goal Pursuits: Human Needs and the Self-Determination of Behavior, *Psychological Inquiry*, 11 (4), 227-268.
- King, P. & Kitchener, K. (1994) *Developing reflective judgment: Understanding and promoting intellectual growth and critical thinking in adolescents and adults.* San Francisco: Jossey-Bass.
- Pintrich, P. R. (2004) A conceptual framework for assessing motivation and self-regulated learning in college students, *Educational Psychology Review*, 16 (4), 385-407.
- Stolk, J., Martello, R., Koehler, K., Chen, K., and Herter, R. (2014) Well, That Didn't Work: A Troubled Attempt to Quantitatively Measure Engineering Students' Lifelong Learning Development Over Two Years of College. *IEEE Frontiers in Education Conference.*

SCIENTIFIC ATTITUDE AND MOTIVATION TOWARD LEARNING SCIENCE of 7th GRADE STUDENTS

Hasan Ozyildirim, Husnuye Durmaz & Seckin Mutlu

Department of Elementary Science Education, Education Faculty, Trakya University (Turkey)

Abstract

The aim of this study was to investigate the effects of the instructional intervention by emphasizing science process skills on the 7th grade students' scientific attitude (SA) and motivation toward science learning (MTSL). This study was designed as non-equivalent control-group pretest-posttest and carried out with totally 43 students in Luleburgaz, Kırklareli, which is in the northwest of Turkey. In this study, while the control group received a regular teaching approach over existing science and technology curriculum, an instructional intervention by emphasizing targeted science process skills via multiple types of practical activities was used in order to integrate the learning of science processes for the experimental group. In this study, both quantitative and qualitative research methods were used. SA and MTSL scales were administrated as pre-test and post-test to both the students of control and experimental groups for the quantitative part of the study. Besides, data for the qualitative part of the study were collected from the semi-structured interviews with 6 students who chosen according to stratified sampling method from the experimental group. The data obtained from scales were analyzed by using ANCOVA. Interview analysis was examined with qualitative analysis methods. According to the results of this study, the significant difference at the $p=0.05$ level was found between the experimental and control group related to the post-test scores of SA and MTSL. When the qualitative data obtained from the experimental group was investigated, it can be suggested that the instructional intervention emphasizing targeted science process skills had positive effect on the students' SA and MTSL.

Keywords: *Science process skills, scientific attitude, motivation toward learning science, elementary student.*

1. Introduction

The teaching and learning methods used for science education are important elements in order to achieve educational aims and have a crucial role in increasing the positive scientific attitudes and motivation towards learning science. When we look into the literature, we see that the effects of different teaching and learning methods on developing the science process skills (SPSs) were investigated (e.g., Coil, Wenderoth, & Dirks, 2010; Serin, 2009; Wilke & Straits, 2005). In this study, we designed an instructional intervention by emphasizing the targeted SPSs to get the students to take part in some aspects of inquiry process and to give them the opportunities to understand the nature of science (NOS). It is very crucial to study how the instructional interventions practiced influence the elementary students' scientific attitudes and motivations towards learning science in order to observe and compare the quality of science education. The aim of this study is to investigate the effects of the instructional intervention by emphasizing science process skills on the 7th grade students' scientific attitude (SA) and motivation towards science learning (MTSL).

2. Method

This study was designed as non-equivalent control-group pretest-posttest and both qualitative and quantitative research methods were used.

2.1. Participants and procedure

A total of 43 7th grade students (experimental group $n=23$, control group $n=20$) in Luleburgaz, Kırklareli, which is in the northwest of Turkey, participated in this study. The participants were chosen according to convenient sampling method (Fraenkel & Wallen, 2009).

The study consisted of 3 units titled with the *Structure and Properties of Matter, Light, and Human and Environment*, and lasted for approximately 18 weeks during the spring semester. The control group received a regular teaching approach as advised by Ministry of National Education (MoNE) in the teacher guide-textbook (Güneş, 2008) over existing science and technology curriculum. In the experimental group, the instructional intervention included: (1) Designing multiple types of practical activities from closed-ended to open-ended according to the degree of the teacher-centered or student-centered learning, (2) Integrating scientific content and procedural knowledge into practical work, (3) Guiding and emphasizing targeted SPS, (4) Using worksheets and/or experiment reports for data collection, and (5) Providing feedback.

2.2. Data collection

SA and MTSL scales were administrated as pre-test and post-test to both the control and experimental groups of the students for the quantitative part of the study. The scale of SA developed originally by Moore and Foy (1997) and adapted to Turkish by Demirbaş and Yağbasan (2005). It is 5 point Likert type and includes 40 items. Cronbach alfa reliability scale coefficient was calculated as 0.824 in this study. The scale of MTSL was developed by Dede and Yaman (2008), and it is 5 point Likert type including 23 items. Cronbach alfa reliability scale coefficient was found to be 0.8 for the participants. Data for the qualitative part of the study were collected via the semi-structured interviews from 6 students, who were chosen according to the stratified sampling method based on their academic achievement of Science Course at previous academic year, in the experimental group. All interviews were recorded in video form which afterwards transcribed into text and analyzed.

2.3. Analysis of data

Initially, the assumptions of normality, equality of variance, and homogeneity of regression slopes for analysis of covariance (ANCOVA) (Fraenkel & Wallen, 2009) were tested for the data obtained from scales SA and MTSL. Since all the assumptions were met, ANCOVA was employed using pretest scores as covariates. The results were assessed at 0.05 level of significance. The data obtained from the written records were qualitatively analyzed by using content analysis method (Corbin & Strauss, 2008) via HyperRESEARCH software. In this process, codes and categories were created to explain the effect of the instructional intervention on the experimental group.

3. Results

3.1. The effects of the instructional intervention on the students' scientific attitudes

ANCOVA was performed to test whether there was a significant difference between the groups in terms of their adjusted post-test SA scores. The results obtained from ANCOVA are given below.

Table 1. ANCOVA results for post-test SA scores adjusted according to pre-test scores, by Group

Source	Sum of Squares	df	Mean square	F	p
Pretest	3094.398	1	3094.398	28.70	0.00
Group	367.319	1	367.319	3.41	0.04*
Error	4312.222	40	107.806		
Total (corrected)	9340.605	42			

*p<0.05

The results reveal that there is a significant difference between the post-test SA scores adjusted according to the pre-test SA scores of the students [$F(1,40)=3.41$, $p<0.05$].

The qualitative data obtained from pre- and post-interviews were examined according to the determined codes. An increase in the number of the students between the pre- and post-interviews was established as the students had much more positive attitude towards science by means of: “more informed about the scientific communication”, “following up-to-date science topics”, “enjoying scientific research”, and “accepting the possibility of change of ideas in science when necessary”. On the other hand, the number of the students who had the thoughts of “scientific research benefits the society” and “anyone who has the interest and will is capable of understanding science” decreased.

3.2. The effects of the instructional intervention on the students' motivation towards science learning

The results of ANCOVA are presented in Table 2.

Table 2. ANCOVA results for post-test MTSL scores adjusted according to pre-test scores, by Group

Source	Sum of Squares	df	Mean square	F	p
Pre-test MTSL	153.476	1	153.476	2.74	0.11
Group	179.036	1	179.036	3.19	0.04*
Error	2241.394	40	56.035		
Total (corrected)	2874.465	42			

*p<0.05

As seen in Table 2, there is a significant difference between the post-test MTSL scores adjusted according to the pre-test MTSL scores of the students [$F(1,40)=3.19$, $p<0.05$].

4. Discussion and Conclusion

The results of the study suggest that the instructional intervention by emphasizing the targeted SPSs has a positive impact on the scientific attitude of the experimental group students. The results also show some certain similarities with Aruna and Sumi's (2010) results. According to Toplis (2011), there is a decline of the attitude of the students aged 11-14 towards school science. The researches on the students' opinions about science education show that even though students are aware of the importance of science, they can still have a negative attitude towards it. The studies also reveal that the instructional methods carried out have a positive impact on students' attitude towards science, and that is why the process is crucial as well as the scientific content and principles (Adesoji, 2008). A successful science education must encourage the students to learn science, and include the strategies to help them use what they have learnt both in the classroom and in their lives (Butler, 2009).

The study shows that a constructive learning environment can be created as a result of the instructional intervention by emphasizing targeted SPSs. This influences the motivation positively towards science learning. The findings are parallel with Butler (2009) and Tseng, Tuan and Chin (2009), the studies of those researches show that the use of constructive educational approaches allow students to discover and solve their own questions actively in a learning environment.

References

- Adesoji, F. A. ((2008). "Managing students' attitude towards science through problem-solving instructional strategy", *Anthropologist*, 10(1), 21-24.
- Butler, M.B. (2009). "Motivating Young Students to be Successful in Science: Keeping It Real, Relevant and Rigorous". In *National Geographic Science: Best Practices and Research Base* (p.5-7). Hapton-Brown Publisher.
- Coil, D., Wenderoth, M. P., Cunningham, M., & Dirks, C. (2010). Teaching the Process of Science: Faculty Perceptions and an Effective Methodology. *CBE—Life Sciences Education*, 9: 524–535.
- Dede, Y. And Yaman, S. (2008). "A Questionnaire for Motivation toward Science Learning: A Validity and Reliability Study". *Necatibey Faculty of Education Electronic Journal of Science and Mathematics Education Vol. 2, Issue 1, 2008, pp. 19-37*
- Demirbaş, M. & Yağbasan, R. (2005). "İlköğretim öğrencilerinin fen bilgisi dersindeki bilimsel tutumlarının belirlenmesi ve geliştirilmesine yönelik öneriler" *XIV. Ulusal Eğitim Bilimleri Kongresi*, Denizli.
- Fraenkel, J. R. and Wallen, N. E. (2009). *How to design and evaluate research in education*. (7th ed.) New York: McGraw-Hill.
- Güneş, B. (Ed.). (2008). *7th grade science and technology textbook*. MEB Devlet Kitapları 2. Baskı, İmpress, Ankara.
- Serin, G. (2009). *The effect of problem based learning instruction on 7th grade students' science achievement, attitude toward science and scientific process skills*. Unpublished Doctoral Dissertation, Middle East Technical University, Ankara, Turkey.
- Toblis, R. (2011). "Students' attitudes to science". *Education in Science*, 243, 22-23. ERIC Number: EJ935885
- Tseng, C. H., Tuan, H.L., and Chin, C. C. (2009). Investigating the influence of motivational factors on conceptual change in a digital learning context using the dual-situated learning model. *International Journal of Science Education*, 32(14), 1855-1875

UTILIZATION OF AD-HOC WIRELESS NETWORKS MODELS IN COURSES OF DISCRETE MATHEMATICS

Adriana Dapena¹, Maria José Souto-Salorio¹, Magda Dettlaff² & Magdalena Lemańska²

¹ *Faculty of Computer Engineering, University of A Coruña, Campus de Elviña, 15071 A Coruña (Spain)*

² *Faculty of Applied Physics and Mathematics, Gdansk University of Technology,
ul. Narutowicza 11/12, 80-233 Gdansk (Poland)*

Abstract

Research shows that students learn and retain much more when they experiment directly in the laboratory, as opposed to when they are only exposed to new concepts in traditional classroom lectures. In this paper, we propose to include “ad-hoc wireless network models” in Courses of Discrete Mathematics. A part of our course is oriented to explain relevant concepts of Graph Theory: connectivity, dominating sets, etc. In laboratory classes, we include activities where the theoretical concepts are related with practical applications developed using a high-level interpreted language.

Keywords: *Discrete Mathematics Courses; Graph Theory; Wireless Networks; Computer Engineering Degree*

1. Introduction

Learning is a dynamic activity. The process of comprehension and understanding of a set of interrelated concepts is greatly enhanced if the student takes an active part in such a process. Previous researches have shown that students learn and retain much more when they experiment directly in the laboratory, as opposed to when they only listen or see concepts in traditional classroom lectures (Diong et al., 2004; Shyr, 2010). It is not a surprise that the European Higher Education Area (EHEA) promotes, among other things, the utilization of Information and Communication Technologies (ICT) in order to reinforce the self-based learning of students. As nowadays students are totally familiarized with ICTs, it is easy for them to learn the use of new software tools without complex memorization requirements. Moreover, graphic-based teaching tools are particularly useful for handling those concepts that sometimes are hidden by abstract ideas.

Our experience in teaching mathematics related courses as part of the Computer Engineering Degree shows that students have difficulties with understanding the mathematical foundations of this engineering area. In order to do our lessons more interesting, we set ourselves the objective of proposing laboratory activities where the theoretical concepts are related with practical applications. In this sense, in this paper, we present laboratory lessons where the concepts of graph theory are related to “ad-hoc wireless network” models. The laboratory is explained using Octave functions developed by us.

2. Regular Lectures

The mathematical concepts of Graph Theory are given through regular lectures. Here we address a brief description of the subject. We recommend the reference (Rosen, 2012).

A graph is an ordered pair $G = (V, E)$ that consists of a non-empty set V of vertices or nodes together with a set E of edges or lines. The adjacency matrix is a way of representing which vertices (or nodes) of a graph are adjacent to which other vertices. Specifically, the adjacency matrix of a finite graph G on n vertices is the $n \times n$ matrix where the non-diagonal entry a_{ij} is the number of edges from vertex i to vertex j , and the diagonal entry a_{ii} is the number of edges (loops) from vertex i to itself. In the special case of a finite simple graph (graph without loops and multiple edges), the adjacency matrix is a $(0,1)$ -matrix with zeros on its diagonal.

A graph is connected when there is a path between every pair of vertices. A graph that is not connected is disconnected. A dominating set for a graph $G = (V, E)$ is a subset D of V such that every vertex not in D is adjacent to at least one member of D . The domination number $\gamma(G)$ is the number of

vertices in a smallest dominating set of G . A connected dominating set (CDS) is a subset of nodes such that:

- any two nodes are joined by a path in the graph such that vertices from this path belong to CDS and
- any node in the graph either belongs to the CDS (CDS node) or has a neighbour in the CDS (non-CDS node).

The minimum CDS (MCDS) is a CDS with minimum cardinality. To find the MCDS is an NP-complete problem for most graphs.

In graph theory, the shortest path problem deals with finding a path between two vertices (or nodes) in a graph such that the sum of the weights of its constituent edges is minimized. Dijkstra's algorithm solves the shortest path problem: for a given source node in the graph, the algorithm finds the shortest path between that node and every other. It can also be used for finding the shortest paths from a single node to a single destination node by stopping the algorithm once the shortest path to the destination node has been determined.

3. Laboratory Lecture

Since our students are in the first course of Computer Engineering Degree, a preliminary description of ad-hoc wireless network is needed.

An ad-hoc wireless network is a decentralized type of wireless network characterized by a lack of fixed communication infrastructure, so the selection of which nodes forward data is dynamically making by considering the current network connectivity. We focus on simple model where the network is represented as an Unit Disk Graph, denoted by $G = (V, E)$; where the nodes (vertices) in V are embedded in the Euclidean plane. We assume that the maximum transmission range is the same for all nodes in the network and it is scaled to one unit.

Several researchers have proposed to use of a virtual backbone in wireless ad-hoc networks as an alternative to the fixed routing infrastructure in classical wired networks. The virtual backbone represents the “skeleton” of the entire network and is used to frequency exchange routing information (traffic conditions, neighborhood information, etc.) and broadcast a message from one node to all the nodes in the networks. A routing algorithm must be optimal in terms of robustness, scalability, power, and time; however, it has been shown that guaranteed delivery generally comes at the expense of any one of these desirables (Tzvetalin, 2013).

In the lectures, we use GNU Octave (Octave, 2014) which is a high-level interpreted language, primarily intended for numerical computations. Octave is distributed under the terms of the GNU General Public License.

We provide the following functions developed by us:

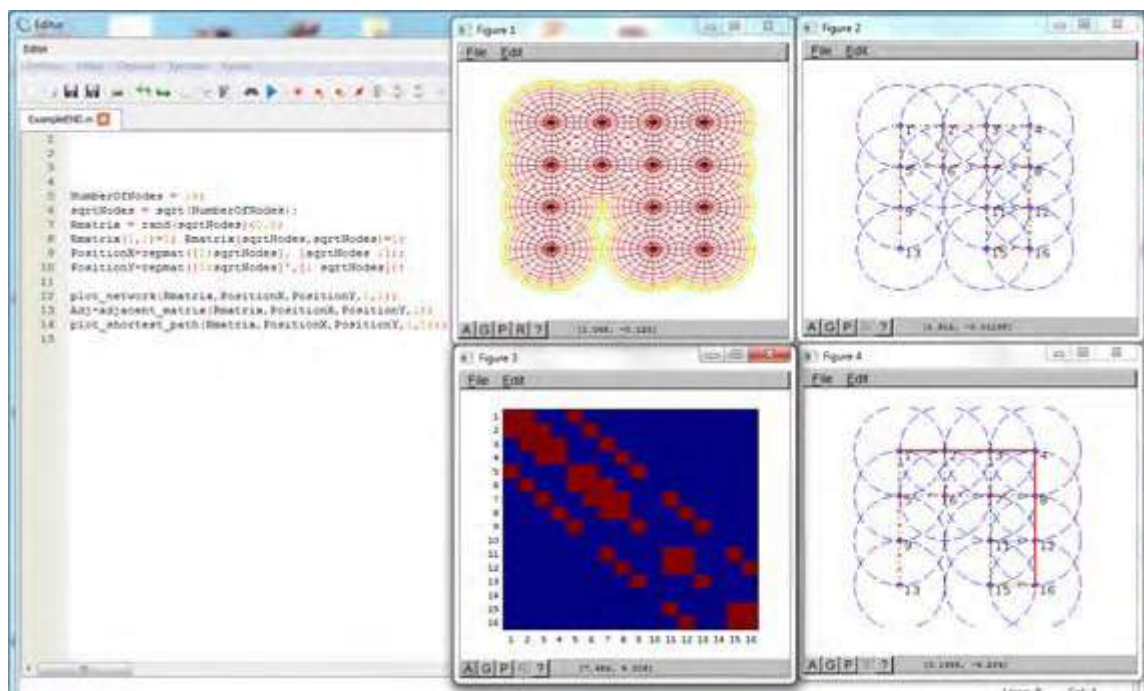
<code>plot_network(Rmatrix,PositionX,PositionY,dim,edges);</code>	Plot the network
<code>Adj=adjacent_matrix(Rmatrix,PositionX,PositionY, showlm);</code>	Find the adjacent matrix (diagonal is equal to 0)
<code>plot_shortest_path(Rmatrix,PositionX,PositionY,nodeini,nodeend);</code>	Plot the shortest path from nodeini to nodeend (using Dijkstra's algorithm)

3.1. Sample Lesson 1:

The first part of this lesson consists of defining several network configurations and in studying the cost of protocol routing based on the Dijkstra's algorithm. An example is shown in Figure 1. The student has defined a network of 16 sensors with coverage radio equal to 1. A node has an activation probability equal to 0.8 (nodes 1 and 16 are activated). The function plots the network (active nodes and connections) and the adjacent matrix. By defect, each node is connected itself. The student has indicated a transmission from node 1 to node 16. The function plots the shortest path: 1 – 2 – 3 – 4 – 8 – 12 – 16.

The second part of the lesson consists of considering that an MCDS is a natural candidate to be the virtual backbone infrastructure in wireless ad-hoc networks because it guarantees the connectivity of the entire network using the minimum number of CDS nodes. Given the same configuration that in the first part, the students must find the MCDS. For instance, one of the MCDS of network in Figure 1 is: 5, 6, 7, 8, 9, 11 and 15. The transmission from node 1 to node 16 is: 1 – 5 – 6 – 7 – 11 – 15 – 16. After doing several simulations, the student must be able to compare Dijkstra's algorithm and CDS-based algorithm in terms of: 1) path length; 2) cost of finding the path.

Figure 1.Example of Laboratory Lesson



3.2. Sample Lesson 2:

We propose to assume that the MCDS is the initial topology of the wireless network (i.e., all packets are transmitted through the nodes in the MCDS). Since in real situations, the nodes can fault, it is needed to reconstruct the MCDS. However, to compute the MCDS each time a change is detected has a high cost even in network with a reduced number of nodes. It is more efficient to incorporate mechanisms to repair the virtual backbone with local information, although it is possible that the new CDS will have not minimum size. We suggest that the students propose local mechanisms to repair the CDS using the following configuration:

- Nodes in the network are identified by its identification numbers, ID.
- Each node in the MCDS has two configuration tables with information of its 1-hop neighbours: the “MCDS table” with the ID of 1-hop neighbours in the MCDS and the “private nodes table” formed by the IDs of the 1-hop neighbours not connected to other MCDS nodes.

Acknowledgements

This work has been partially supported by Ministerio de Economía y Competitividad (Spanish Government) under grant number TEC2013-47141-C4-1-R

References

- (Diong et al., 2004) Diong, A., Wicker, R., Pieana, D., and R., Q. (2004). A laboratory designed to enhance students' interest in learning of controls, *International Journal of Engineering Education*, vol. 20, issue 4, pp. 628–637.
- (Octave, 2014) <http://www.gnu.org/software/octave/>
- (Rosen, 2012) Rose, K. H., *Discrete Mathematics and Its Applications*, 7 Ed., McGraw Hill, New York, 2012.
- (Shyr, 2010) Shyr, L. W., (2010) Integrating laboratory activity into a junior high school classroom, *IEEE Transactions on Education*, vol. 53, pp. 32–37, 2010.
- (Tzvetalin, 2013) Tzvetalin S., and Vassilev, B. E. Wireless Routing in Ad-Hoc Networks, *Computer Science and Engineering*, vol 2, issue 1, pp. 1–7, 2013.

FLIPPED HOMEWORK SOLUTIONS

Andrea Breitenbach

Institute of Sociology, Goethe University Frankfurt (Germany)

Abstract

In order to make the quantitative methodology clearer and to increase the quality of teaching, this work attempts to produce practice-oriented course models. The emphasis is on the development of a new teaching approach for the “Introduction to Stata” course.

After the concept of the flipped classroom for a statistic course proved successful, it seemed sensible to apply this concept in a modified form to a Stata introductory course, in order to increase support for the participants and to simplify learning of the seminar contents. The participants do not have to prepare themselves with videos for this seminar, unlike with the flipped classroom, but sample solutions will be provided in the form of videos (screencasts) for preparation and follow-up, and to practice the subject matter of the required homework. This offers numerous advantages for giving the students better support, since rather than discussing the homework at length in the seminar, the sample solutions are available on video. As a result the seminar time can be better used: for instance for delivering content; addressing questions and problems; or to practice the content learned. Sufficient time for practice is especially necessary in application-oriented seminars, however the time margin is usually too tight for this. It is known that outside the seminar the content is not worked on or practiced to a great extent and it is forgotten quickly. The support time allocated with this concept ultimately fulfils several purposes: better, more intensive support; an improvement in learning; better seminars performance etc.

Additionally, after the seminar has ended a summary of the most important Stata commands available in video form. This serves to refresh the information that has been learned, to rework content as required or to give assistance with the seminar paper.

Assessment of the new concept will be carried out by means of expert interviews and evaluation and will be available in August 2015.

Keywords: *Innovative teaching methods, didactics, Flipped Classroom, Improvement of teaching*

VIDEOS: DO THEY DISTRACT OR INSPIRE LEARNING? APPLICATION TO CHEMISTRY LAB OF FIRST UNIVERSITY YEAR

**Sara García-Salgado, M. Ángeles Quijano Nieto, Rosa Domínguez Gómez,
M. Carmen Heredia Molinero & Rosario Torralba Marco**

*Departamento de Ingeniería Civil: Hidráulica y Ordenación del Territorio. E.T.S. Ingeniería Civil.
Universidad Politécnica de Madrid (Spain)*

Abstract

The use of videos as a teaching support is increasingly introduced in all educational levels. The significant reduction in the teaching hours of the subject Chemistry regarding the previous curriculum (from an annual to a semester subject), due to Bologna Process, has led us to look for new methodologies that serve as teaching support and encourage the student learning. For this purpose, a group of Chemistry teachers from Technical University of Madrid, Spain (*Universidad Politécnica de Madrid, UPM*), within an educational innovation project funded by our University, have developed a set of sixteen videos related to the content of different chemistry labs in the various subjects of Chemistry of the Degree Courses at our university. These videos have been used by teachers for their explanations on theoretical and practical laboratory classes.

In order to assess the efficiency of the use of these videos, a study with first Degree year students has been performed in the School of Civil Engineering (UPM), collecting feedback from students and teachers by questionnaires fulfilled immediately after finishing the corresponding practice.

The results obtained from the analysis of students' and teachers' opinions have been compared with the marks obtained by the students, which are more objective data, with the aim of verifying the impact of these technologies and methodologies in the learning of our students.

Keywords: *Chemistry lab practices, videos, first university year students.*

1. Introduction and Objectives

During the academic courses 2010/11 and 2011/12, several teachers from different educational innovation groups in UPM, developed sixteen videos related to the content of different chemistry lab practices, in order to use them as a teaching support for theoretical and practical lectures of this subject, which is included in more than six Degrees of our University. This was made possible by different calls for educational innovation projects, funded by UPM (IE PT105815144, 2010-11; IE PT58029, 2011-12).

Chemistry is a basic subject of the first year of Civil Engineering Degree, and in its program it is included the performance of four lab practices, in three different sessions. It is noteworthy that most students entering this degree did not choose to study Chemistry in the last year of High School, and therefore their initial knowledge about the subject is generally low. In fact, many of them have never performed chemistry lab practices previously, so teachers felt that videos could be used as visual and attractive guides to facilitate the realization of the lab practices included in the subject. From the academic course 2011/12, two of the above mentioned videos have been used as reinforcement to the explanation of the lab practices, due to the better results obtained for the subject during this course, with a significant reduction in the percentage of desertion.

In order to assess objectively the improvements observed by using videos in the lab practice class sessions, during the academic course 2012/13, we developed a survey that both students and teachers had to answer, once every practice was finished. The results obtained in this study are shown in the present work.

2. Design and Methods

The three lab practices that were carried out are:

- 1) Preparation of solutions (together with identification of lab materials and chemicals);

2) Determination of Fe_2O_3 in a cement sample; and

3a) Study of metal corrosion and protection of metals and 3b) Action of inorganic acids on materials used in construction (in both part of the third lab practice, the students must observe the different processes that happens, so there is not a video).

The first year of the Civil Engineering Degree is divided in five groups of students (of 50-80 students per group), so the subject of Chemistry is taught in these five groups by 5 different teachers, although the working method of all the groups is the same. Every group is usually divided into different lab turns, taking into account the capacity of the laboratory (22 students).

The assessment of the use of videos was performed taking into account the following aspects:

a) The teacher of every group, who is in charge of both theoretical and practical lectures, compared the results obtained for the subject with those from other academic courses.

b) Feedback from students and teachers was collected through various surveys.

In the three lab practices, different working methods were followed, using a written summary, which includes the aims and the experimental procedure of the lab practice, and a template for final report of results, which students have to complete with the collected experimental data, perform calculations and answer short questions about the lab practice; with or without videos showing the experimental procedure with a brief explanation and an explanation in class session with resolution of doubts. For a better understanding, this is summarized in *Table 1*.

Table 1. Schematic summary of the procedure followed for lab practice class sessions.

Lab practice	Written summary	Video	Final report of results	Explanation in class session
1) Preparation of solutions	✓	✓	✓ ^a	✓
2) Determination of Fe_2O_3 in cement	✓	✓	✓ ^a	×
3) Study of metal corrosion	✓	×	✓ ^b	✓

^a It is corrected by the teacher. ^b It is corrected during a class session.

One week before the lab practice is carried out, the students of every lab turn have available for them, in the virtual course platform *Moodle* (<https://moodle.upm.es/>), the written summary and the template for final report of results, together with the video in the case of lab practices 1 and 2. Furthermore, they must give the teacher a schematic summary of lab practice before its performance (it is required to enter the laboratory), in order to ensure that students have previously read the summary and watched the video.

In this experience, once every practice was finished, both students and teachers must have answered the corresponding questionnaire. The survey questions are shown in *Table 2*, which might be rated on a scale from 1 (totally disagree) to 6 (totally agree). The results obtained are discussed in the following section.

Table 2. Survey questions related to the use of videos for students and teachers, rated from 1 (totally disagree) to 6 (totally agree).

Students	Teachers
Do you think that watching the video has facilitated your performance in the lab practice?	Have been students agile when performing the lab practice?
Has the use of video improved your understanding of the lab practice?	Did they have manual dexterity when performing the lab practice?
Will you watch the video again to prepare the final written exam about lab practices?	Did they ask for teacher's help?
In your opinion, can the video replace the explanation by the teacher in class session?	The average level of the students' learning has been ...

3. Results and Discussion

The students that performed the lab practices during the academic course 2012/13 were 286, and between them, the 90% watched the video in *Moodle* platform before assisting the lab practices. Among the remaining 10%, 3-4% had problems to access the website where the videos are hosted (*Moodle*).

In the lab practices for which a video was available, but they were different in the explanation in class session by the teacher, i.e. lab practices 1 and 2, there were no differences between the issues raised in the survey, all of them obtaining a score higher than 4 out of 6.

According to students' opinion, to watch the video previously to enter the laboratory, facilitated the realization of lab practice (5.0 out of 6; SD 0.9), allowed them to understand it in a better way (4.9 out

of 6; SD 0.9) and a large majority declared their intention to consult the video to prepare the written exam about the lab practices (4.8 out of 6; SD 1.1).

Since the working methods for the three lab practices were different, in our opinion was also interesting to take into account the time spent by the students to prepare and perform every lab practice, as well as to complete the final report of results. It is important to highlight that these data cannot be only be treated from a quantitative point of view, because the experimental procedures of the three lab practices are completely different. However, it can be stated that, for the first lab practice, the students need a longer time because, in most cases, they do not have a previous experience in a Chemistry lab. In the case of the second lab practice, the time spent is the longest, because the experimental procedure of this lab practice is formed by several steps. Finally, the experimental manipulation in the third lab practice is very low, although this lab practice is formed by two parts. We have observed that the maximum total time spent by students per lab practice is around 90 min (for the second lab practice).

In an overall assessment of the use of videos in the lab practice of Chemistry, the students show preference for watching the videos prior to perform de lab practices, but they do not renounce to the further explanation by the teacher (3.2 out of 6; SD 1.2).

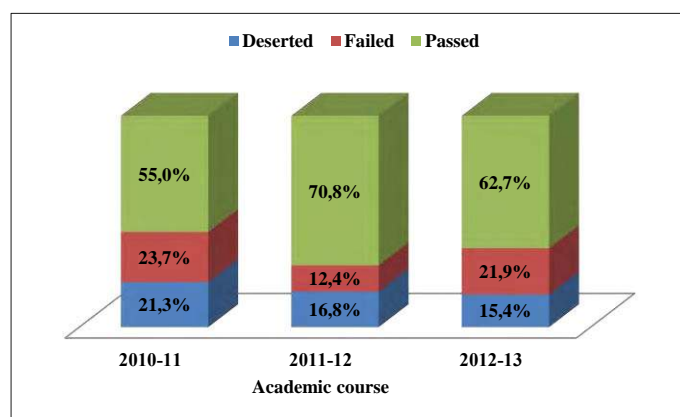
From the teachers' point of view, the fact that the students watch the videos prior to perform de lab practices increases their agility and provides them with a greater manual dexterity, even in the first lab practice, which is the first contact with a Chemistry lab for many of them. Both agility and manual dexterity are of great relevance, which contributes to an increase in the lab safety.

In the lab practices for which a video was available (1 and 2), students asked for little help to the corresponding teacher, when compared with the third lab practice. In the case of asking for help, the questions were about the experimental procedure and the related concepts.

4. Conclusions

It has been observed that the use of audiovisual materials as teaching tools motivate and encourage the students' learning, which impacts on the marks obtained in the lab practices, because of the clear improvement that has been found since this kind of materials is used (*Figure 1*). Furthermore, a decrease in the percentage of students that do not assist the lab practices has been observed, which has a large impact in decreasing the desertion of the subject. Therefore, the videos constitute a complementary and useful tool, which facilitates the students' learning. However, they of course do not substitute their personal study work.

Figure 1. Results obtained for the lab practices of Chemistry during three academic courses (videos have been used from the academic course 2011-12 and onwards).



References

- Educational Innovation Project intercentre (IE PT105815144, 2010-2011). *Prácticas de Química en las titulaciones de Grado de la Universidad Politécnica de Madrid*. Retrieved 2011, from <http://www.ice.upm.es/investigacion/giq/videos/>
- Educational Innovation Project intercentre (IE PT58029, 2011-2012). *La Química y la Física, dos de los pilares básicos del conocimiento científico técnico. Estrategias de colaboración entre la Enseñanza Universitaria y las Enseñanzas Medias*. Retrieved February 2013, from http://innovacioneducativa.upm.es/documentos/proyectos/memoria_transversales_2011_12.pdf

THE ELECTRON MICROSCOPY TECHNIQUE AS AN EDUCATIONAL RESOURCE TO EXPLORE THE CONCEPTION OF SCIENCE BY THE STUDENTS IN CLASSES OF CHEMISTRY

Mayara de Carvalho Santos, Ladário da Silva & Alceu Júnior Paz da Silva
Instituto de Ciências Exatas, Universidade Federal Fluminense (Brazil)

Abstract

It is expected that science students should understand how scientific thinking has changed and how it was affected by the social, cultural and historical context in which it has been developed. Specifically, it can be seen that there are great difficulties in teaching and learning of atomic models, and the history of science can help to overcome these difficulties. The greatest observed difficulty is that students do not realize that science is not an exact speech of reality, but rather a process that aims to develop models to interpret and explain the reality. So science is not finished, their models are always being improved or changed due to the limitations encountered when advances in scientific research occur. This research is based on the construction of a teaching unit that relates atomistic teaching with a scientific research done by two authors of the present work in a forensic project, using the Scanning Electron Microscopy coupled with Energy Dispersive Spectrometer (SEM/EDS). Fireworks residues have similarities to gunshot residues (GSR) and the used technique to characterize both residues allows establishing the similarities and differences between them. To understand this research process and the involved chemical and physical concepts facilitates the understanding the forensic researcher work and the students' involvement may help them to perceive the construction of science. An easy experiment can be performed in the classroom to illustrate the fireworks residues characterization and hence to assist in atomistic teaching. Therefore, we can explore the students' vision of science and better teach atomic models. The history of the development of atomic models serves not only to explain the cited scientific research and make a comparison of the evolution of the techniques used in research, but also to clarify the utility of models for science.

Keywords: *Electron Microscopy, Chemistry, Conception of Science.*

1. Introduction

The study of sciences is essentially important for the critical formation of citizen, even more when this citizen is part of a society totally dependent on technology. However, we can notice that the interest for the scientific education or by subjects linked to science is outside the interests of many modern individuals. This condition associated with other factors lead to the crisis in the educational system we face nowadays. Science teaching is actually realized in schools in a way that usually excludes the History and Philosophy of Science, despite there is authors who claim that this inclusion enriches the science classes, concerning practices and theory (MATTHEWS, 1995).

This approach of themes of Nature of Science in classrooms is defended not only as a compulsory element of the curriculum, but it also contributes to a better and richer comprehension of themes related to science. It is understood that students of science should comprehend how the scientific thought has been modified throughout history and how it was affected by the social, cultural and historic contexts in which it has developed. In the last century, we could notice a relation among great scientist in defending the inclusion of History, Philosophy and Sociology in science teaching, mainly in the United States and Great-Britain (MATTHEWS, 1995).

Specifically, one can perceive that there are great difficulties in teaching and learning certain themes related to modern physics as atomic models. In this case History of Science can help to overcome these difficulties. The greatest observed difficulty is that students (and sometimes their teachers) do not understand that science is not an exact speech of reality, but rather it is a process that intends to elaborate models which can interpret and explain the reality. Science is not finished; its models are always being improved or changed due to its limitations when scientific research improves (MELO & NETO, 2013).

Thinking about it, our proposal is to explore the different conceptions of science that students have in basic education. For this, we decided to put the student in the position of a scientist who should investigate, search and try to find answers for some questions and analyzing this process could be an efficient way to understand what students think of that process (GALIAZZI et al, 2001). Science uses the concept of models in various areas as this concept is useful to explain some phenomena. A good example of this concept is the atom. There is apparently a very great difficulty not only by students but also by their teachers to understand that the atom is a model that evolves according to the new findings and, therefore, not an object finished. We propose that these two tools are related and properly reunited in a single teaching unit.

Parallel to this, two of the authors of this study perform another research (Santos et al, 2014) that involves the analysis of gunshot residues (GSR) and fireworks residues in order to establish the similarities and differences between them. The characteristic gunshot residues are spherical ones and simultaneously composed of lead (Pb), barium (Ba) and antimony (Sb), and car engines, gasoline, paint, urine, cigarettes and fireworks may have elements also found in gunshot residues. The recommended standard technique for searching gunshot residues uses the Scanning Electron Microscope coupled with Energy Dispersive Spectrometer (SEM/EDS), once this equipment has the ability to analyze two parameters: morphology and elemental composition of residue. To understand the functioning of this technique and of the equipment, it is necessary that the notion of atomic models is fundamentally established by the students. This concept is especially important also for the student to understand the phenomenon of color formation after firing of fireworks. The colors in fireworks are formed by some materials mainly composed of barium, sodium, calcium, strontium, aluminium, iron, lithium, and copper, among others, which may also be found in gunshot residues.

Besides the attractive that forensic science leads to young people this is a good option to invite them to put themselves in the place of a scientist and try to solve the problem of residues of fireworks that can be confused with gunshot residues. In addition, the evolution of gunshot residues analysis technique has an important role in the perception of how science itself evolves as new scientific discoveries take place and how models are improved.

This research approach must be presented to the students and guided by a questionnaire. To this end, we propose to students a flame test experiment to elucidate the phenomenon that occurs with the fireworks, creating all favourable environments for the students' ideas to flow. For students to understand how the equipment used in forensic research work and to understand that the color appearance of the phenomenon under the flame reinforce that they must have notion of atomic properties of matter. Therefore, it is essential that the history and chronology of the development of atomic models part of this teaching unit, as well as the discussion on the need for the use of models in science.

2. Methods

This teaching unit is inspired by the pedagogical moments of Delizoicov and Angotti (1990) which refer to the initial questioning, organization and application of knowledge. The initial situation is placed as the form of a problem: how to distinguish gunshot residues of fireworks residues? Students should suggest some ways to solve the problem and enter the chemistry in this context. Therefore, they should use its everyday and chemical knowledge to try to propose an efficient way to solve this problem. Even in the questioning, a flame test experiment is carried out with six chloride salts (in the form of inorganic salt) and in the same way, students will try to explain what happens when the salts are put in the flame as the coloring is formed by each one, because the colors are different for each salt. It is also questioned if there are relations between the color of the solid salt and the color of the flame and what are the differences and similarities in the constitution of each salt. In this moment the students put their thoughts into practice and become active during the lesson. We want to know what they are thinking and how far their personal knowledge may lead them, so that they feel the need to acquire new knowledge.

The moment of the knowledge organization occurs when we present the results as well as the technique used in forensic research for students without giving up the discussion of the answers given by them. Then, we should explain to the students how the scientific research in GSR and fireworks residues is done, as well as briefly introduce the technique and operation of the SEM/EDS. It is also important to discuss how the chemical knowledge is essential for the research and thus students can start developing the idea of how science is constituted, how it is produced and how the scientist's work is realized. Even then, the story of the development of atomic models is discussed with the students. The whole context in which each atomic model was proposed should be properly treated so that the student can understand how useful for the science the atomic models concept is. In this reasoning the student may perceive how the knowledge of each historical period is modified throughout history. This parallel is also made with the history of the evolution of the techniques of analysis of gunshot residues. This content is extremely rich,

once in addition to promoting the use of history and philosophy of science, it facilitates the discussion of the useful tools of science as well as it can also explain how scientific thought is built. Finally, with all of the above information, the student can already fix the knowledge acquired in the form to apply what has been learned in new situations, autonomously.

3. Conclusion

Based on the idea that every student should know the processes involved in the construction of science, we propose a teaching unit that the students take the position of a scientist and so perceive the importance of the science evolution in this scientific problem. In this approach History of Science also takes an important role. A teaching unit is proposed which can be implemented in different grades of high school classes. Therefore, we designed a didactic unit in order to approach a real scientific research that attracts the interest of the students. In this approach we explore the concept of atomic models and use it to explain the research of fireworks residues and GSR. So we engage students in an active research field and justify the importance of the history of chemistry in a teaching of atomic models. As a result a very dynamic class is implemented, which is based on a methodology aiming the achievement of an independent and critical knowledge construction.

References

- Chalmers, A. F. (1993). *O que é Ciência, afinal?* São Paulo: Editora Brasiliense.
- Delizoicov, D.; Angotti, J. A. (1990). *Metodologia no Ensino de Ciências*. São Paulo: Editora Cortez.
- Galiazzi, M.C.; Rocha, J. M. B.; Schmitz, L. C.; Souza, M. L.; Giesta. S.; Gonçalves, F. P. (2001). *Objetivos das Atividades Experimentais no Ensino Médio: A Pesquisa Coletiva Como Modo de Formação de Professores de Ciência*. Bauru: Ciência & Educação.
- Matthews, M. R. (1995). *História, Filosofia e Ensino de Ciências: a Tendência Atual de Reaproximação*. Florianópolis: Caderno Brasileiro do Ensino de Física.
- Melo, M. R.; Neto, E. G. L. (2013). *Dificuldades de Ensino e Aprendizagem dos Modelos Atômicos em Química*. São Paulo: Revista Química Nova na Escola.
- Santos, M. C.; Alves, R. S.; Novaes, C. G.; Da Silva, L. (2014). *Análise de Resíduos Similares aos de Tiros*. Niterói: Relatório de Iniciação Científica - PIBIC

EFFECTS OF INQUIRY-BASED SCIENCE TEACHING ON STUDENTS' SCIENCE PROCESSES AND CRITICAL THINKING SKILLS AND ACHIEVEMENTS

Hüsnüye Durmaz & Özden Çolak

Department of Elementary Science Education, Education Faculty, Trakya University (Turkey)

Abstract

The aim of this study is to investigate the effects of inquiry-based science teaching method on skills of science processes and critical thinking, and science achievement of the 6th grade students. Non-equivalent control group quasi-experimental design was employed for research design. This study was conducted on the unit of matter and heat with forty-six students in total in a public school located in the northwest of Turkey. The experimental group studied inquiry-based science teaching method, besides the lesson plans prepared according to 5E learning model. Each activity of the unit of matter and heat in the 6th grade science textbook was redesigned with multiple types of inquiry activities from structured to open-ended for the experimental group. The control group studied in accordance with a regular teaching approach based on the textbook by following the teacher guided book. The tests of scientific processes assessment, Cornell critical thinking (level X) and academic achievement were administrated as pretest and posttest to both groups of students. The data obtained were analyzed both for inferential and descriptive purposes. When the assumptions of the general-linear model were not met, Mann-Whitney U test for independent samples was employed. The results were assessed at 0.05 level of significance. According to the results of the study, the significant difference was found between the experimental and control groups related to the posttest scores of scientific processes skills, critical thinking skills, and achievements. The results indicated that the inquiry-based science teaching method had positive effects on the improvement of science processes skills, critical thinking skills, and academic achievements of the 6th grade students.

Keywords: *Critical thinking skills, elementary student, inquiry-based science teaching, science achievement, science processes skills.*

1. Introduction

One important goal of science education is to raise scientifically literate students. Besides the skills of science processes (SPSs) and critical thinking (CT) as well as science achievement, inquiry is an important component in learning science, and it plays a key role in improving scientific literacy of students (NRC, 2000).

Scientific inquiry includes general science process skills (such as asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, constructing explanations), science content, creativity, and critical thinking to develop scientific knowledge (Lederman, 2009). Learning cycle has also an important place within student-centred instructional practices. The fundamental purpose of integrating the 5E's learning cycle in inquiry-based teaching is to develop a richer understanding of science concepts and a more sophisticated understanding of how scientists work (Lederman, 2009). Based on science literature, it can be stated that students can enhance their SPSs and CT skills when they participate in inquiry activities designed by using 5E learning model.

Although extensive research has been carried out on using inquiry-based learning (e.g. Blanchard, Southerland, Osborne, Sampson, Annetta, & Granger, 2010), there are not enough studies investigating the matter and heat subject. In the present study, we focused on matter and heat unit, because it is one of the science subjects most relevant to students' everyday lives, and research on student learning indicates that students have difficulties in learning the heat subject (Harrison, Grayson & Treagust, 1999). The aim of this study is to investigate the effects of inquiry-based science teaching method on the skills of science processes and critical thinking, and science achievement of the 6th grade students.

2. Methods and research design

This study was conducted on the unit of matter and heat with forty-six students in a public school located in the northwest of Turkey. Non-equivalent control group quasi-experimental design was employed for research design (Fraenkel & Wallen, 2009). Tools to collect data were administrated as pretest and posttest to the participants. The experimental group studied inquiry-based science teaching method, besides the lesson plans prepared according to 5E learning model. Each activity of the unit of matter and heat in the 6th grade science textbook was redesigned with multiple types of inquiry activities from structured, guided, coupled and to open-ended for the experimental group. The control group studied in accordance with a regular teaching approach based on the textbook by following the teacher guided book.

We used the Turkish versions of the test of Scientific Process Assessment (SPS) and Cornell Critical Thinking (CT)-Level X, and achievement test related to the unit of matter and heat to collect data. *The test of SPS* developed originally by Smith and Welliver (1995) was adapted into Turkish by Basdag (2006). For this study, the reliability coefficient of the test was found 0.79. Turkish version of *the test of CT* (Akar, 2007), which is originally developed by Ennis and Millman (1985), was utilized. *Achievement test* related to the unit of matter and heat was developed by Basdas (2007). Cronbach alfa reliability coefficient was found 0.768.

To analyze the data, the Statistical Package for the Social Sciences (SPSS) was used both for inferential and descriptive purposes. Initially, normality assumption was tested with Shapiro-Wilk test. When the assumptions of the general-linear model were not met, Mann-Whitney U test for independent samples was employed. The results were assessed at 0.05 level of significance.

3. Results

The scores obtained from the test of SPS and CT did not show a normal distribution, thus Mann-Whitney U test was separately performed to see whether there was a significant difference in both SPS and CT pre-tests scores between the experimental and control groups. Results revealed that at the beginning of the study, there was not any significant difference at 0.05 level between the groups for pre-tests (for SPS Mann-Whitney $U=233.50$, $p=0.495$; for CT Mann-Whitney $U=195.500$, $p=0.128$). To examine the effects of inquiry-based science teaching on students' SPSs and CT, we separately employed Mann-Whitney U test for independent groups to the data obtained from post-tests of both the tests. Results obtained are given in Table 1.

Table 1. Comparison of groups' scores on post-tests of SPS and CT with Mann-Whitney U test

Test	Experimental Group			Control Group			U	p
	n	Mean Rank	Sum of Ranks	n	Mean Rank	Sum of Ranks		
SPS	23	27.85	640.50	23	19.15	440.50	164.50	0.03*
CT	23	27.67	636.50	23	19.33	444.50	168.50	0.03*

* $p<0.05$

As seen in Table 1, the difference between the experimental and control groups related to the post-test scores of both tests (for SPS Mann-Whitney $U=164.50$, $p<0.05$; for CT Mann-Whitney $U=168.50$, $p<0.05$) was statistically significant. It might be asserted that the experimental group improved their SPS and CT more than the control group via inquiry-based activities.

To investigate the effect of inquiry-based science teaching on students' achievement of the 'matter and heat' unit, firstly, the univariate normality and equality of variance assumptions were tested. Then, since the assumptions were met, independent samples t-test was employed to compare the scores of the groups' pre-tests of achievement test. Results showed that there was not any significant difference at 0.05 level between the groups for pre-tests ($t_{(44)}=0.10$; $p=0.92$). Therefore, we preferred independent sample t-test to compare the scores of the experimental and control groups' post-tests of achievement.

Table 2. Independent t-testi results of groups' scores on post-tests of achievement of the unit 'matter and heat'

Group	n	$\bar{X}_{(\text{mean})}$	SD	df	t	p
Experimental	23	11.50	3.07	44	2.16	0.04*
Control	23	9.39	3.46			

* $P<0.05$

As displayed in Table 2, the results indicate that there is a statistically significant difference ($t_{(43)}=2.16$; $p<0.05$) between two groups' achievement in favour of the experimental group's post-test.

4. Discussion and Conclusion

Related to the effects of the inquiry-based science teaching method on the students' SPSs, CT, and achievement, the data revealed that inquiry-based activities designed by 5E learning model were significantly more effective than instruction based on the existing curriculum following the teacher guide book. A possible explanation might be that the experimental students had more opportunities to do science through inquiry-based activities, and they paid particular attention to ask questions, observe objects or events, design and carry out investigations, analyze and interpret data, and draw conclusions. The result of the study is consistent with that of previous studies revealing that using inquiry based learning develops students' SPSs (Celik & Cavas, 2012; Rogers & Abel, 2008). With respect to the CT skills, based on literature, it was reported that teaching science through inquiry is an effective teaching strategy for developing higher-order, critical and creative thinking in a scientific context (e.g., Katchevich, Hofstein, & Mamlok-Naaman, 2013). In terms of enhancing students' science achievement, a significant difference was found between the experimental and control groups' post-test scores of science achievement. This finding corresponds to that of several studies in the literature showing that the inquiry-based teaching practices had positive effects both in fostering conceptual understanding in different contexts, developing SPSs, and understanding the NOS (Kock, Taconis, & Gravemeijer, 2013).

To sum up, the inquiry-based science teaching method had positive effects on the improvement of science processes skills, critical thinking skills, and academic achievements of the 6th grade students.

References

- Akar, C. (2007). Critical thinking skills of elementary school students. Unpublished Doctoral Dissertation, Gazi University, Ankara, Turkey.
- Basdag, G. (2006). *To compare the science and technology curriculum of the 2004 with the science curriculum of the 2000 in their effects on developing the students' scientific process skills*. Unpublished Master Thesis. Gazi University, Ankara, Turkey.
- Basdas, E. (2007). *The Effect of Hands-on Science Learning Method in the Education of Science in Primary School on The Science Process Skills, Academic Achievement and Motivation*. Unpublished Master Thesis, Celal Bayar University, Manisa, Turkey.
- Blanchard, M., Southerland, S., Osborne, J., Sampson, V., Annetta, L., & Granger, E. (2010). Is inquiry possible in light of accountability? A quantitative comparison of the relative effectiveness of guided inquiry and traditional verification laboratory instruction. *Science Education*, 94(4), 577-616.
- Celik, K. & Cavas, B. (2012). The effect of inquiry based learning method for the teaching for reproduction, growth and development in the living things unit on the students' academic achievements, science process skills and attitudes toward science and technology course. *Ege Egitim Dergisi* 13(2), 50-75.
- Fraenkel, J. R. & Wallen, N. E. (2009). *How to design and evaluate research in education*. (7th ed.) New York: McGraw-Hill.
- Harrison, A. G., Grayson, D. J., & Treagust, D. F. (1999). Investigating a Grade 11 Student's Evolving Conceptions of Heat and Temperature. *Journal of Research in Science Teaching*, 36(1), 55-87.
- Katchevich, D., Hofstein, A., & Mamlok-Naaman, R. (2013). Argumentation in the Chemistry Laboratory: Inquiry and Confirmatory Experiments. *Research in Science Education*, 43(1), 317-345.
- Kock, Z.J., Taconis, R., Bolhuis, S., & Gravemeijer, K. (2013). Some Key Issues in Creating Inquiry-Based Instructional Practices that Aim at the Understanding of Simple Electric Circuits. *Research in Science Education*, 43(2), 579-597. DOI: 10.1007/s11165-011-9278-6
- Lederman, J. S. (2009). Levels of Inquiry and the 5 E's Learning Cycle Model. In *National Geographic Science: Best Practices and Research Base*. Hapton-Brown Publishers.
- National Research Council [NRC]. (2000). *Inquiry and the National Science Education Standards: A Guide for Teaching and Learning*. Washington, D.C: National Academy Press.
- Rogers, M.A.P.&Abel, S.K. (2008). The Design, Enactment, and Experience of Inquiry-Based Instruction in Undergraduate Science Education: A Case Study. *Science Education*, 92(4), 591- 607.

THE CONTENT OF TRUST AND THE FUNCTION OF MANAGER AND EDUCATIONAL LEADER IN SCHOOL HEADS' OPINIONS

Jakub Kołodziejczyk

Institute of Public Affairs, Jagiellonian University (Poland)

Abstract

The reflection on the distinct character of the functions of manager and leader is particularly important in the contemporary context where the role of educational leadership in school management is expected to grow in importance. At the same time, specialists point out the significance of trust that is an essential condition for the right functioning of school and for its improvement. Trust is always related to something and assumes expectation of others' actions. The content of expectation may vary according to situations, professional roles and institutions. Sztompka (2007) indicates three different types of the content of expectation related to trust: instrumental (showing in competencies, efficiency, rationality in action), moral (showing in truthfulness, honesty and loyalty) and fiducial (showing in disinterested care, help, kindness). The aim of the present research was to describe what type of trust content is associated with the role of leader and manager by school heads. In the research, we analyzed the answers to the survey in which the principals were asked to choose 5 features out of 40 that describe best a leader and a manager. The analysis consisted in establishing the frequency of the features corresponding to the aforementioned types of trust content. In the specification of the leader's characteristics, the characteristics referring to axiological and instrumental trust have been mentioned with similar frequency. In the description of the manager's role, the most important expectations have been related to instrumental trust and to moral trust. With reference to both roles, the least frequently chosen characteristics have been those related to the most risky type of trust, i.e. fiduciary trust.

Keywords: *Trust, educational leadership, head teacher.*

1. Introduction

A reflection on the different nature of the manager's and the educational leader's functions plays a special role in the context of the current expectations concerning an increase in the significance of educational leadership in school management (*Council conclusions on effective leadership in education...*), and it is the consequence of changes which took place in the several past decades in the perception of the head teacher's role, autonomy, responsibility and accountability (Bush, Bell and Middlewood 2010).

Researchers share the opinion that leadership and management are not equivalent but they differ considerably with regard to the estimation of the scope of differences (Yukl, 2013). Some of them present leadership and management as completely opposite, qualitatively different, and mutually exclusive processes. Abraham Zaleznik (1977), a representative of this line of thought, stresses the diametrical differences between them, from personal motivation to the way of thinking and acting, concluding that "... managers and leaders are very different kinds of people" (Zaleznik, 1977, p. 68).

Other authors differentiate between leadership and management in a less categorical manner. Gosling and Mintzberg (2003) suggest that management is made up of various processes, while leadership performs a key role, but one of many roles, included in the scope of management. John Kotter and Craig R. Hickman (Kotter, 1990; Hickman, 1990) perceive leadership and management as two different processes in an organization, but they also claim that these processes have to complement one another. The different manner of defining leadership and management is not only a purely theoretical discussion; the different ways of conceptualizing the role of the leader and the manager can also be seen in practitioners' opinions (Kołodziejczyk, 2014).

Trust in school leaders and managers is more and more frequently perceived by scholars and practitioners as a significant factor influencing pupils' learning process. In the relations between the manager or the leader and other employees, trust is an element which unites them in their activities

oriented towards children's good (Bryk & Schneider 2002). Simultaneously, as Precey (2012) observes, the popularization of standardized tests in national educational systems, the narrowing of teaching curricula, the growth of public accountability due to inspections, are the reasons for the disappearance of competitiveness at the local, national and international levels, and in time they lead to the absence of trust and undermine teachers' morale and professionalism.

Trust always refers to something; a certain expectation concerning other people's actions is always connected with it. The expectation may be changing, depending on various situations, professional roles and institutions. Sztompka (2007) presents three various types of expectations related to trust in someone: instrumental expectations (manifested in competences, effectiveness, rational actions), moral expectations (manifested in truthfulness, honesty, loyalty) and fiduciary expectations (manifested in selfless care, assistance and kindness).

2. Objectives

The research objective has been a presentation of the types of trust attributed by school head teachers to the roles of the leader and the manager.

3. Methods

172 head teachers participated in the research: 132 women and 40 men. The majority of the respondents (96) are head teachers in town schools, 24 - in urban-rural municipality schools, and 52 - in rural schools. They are head teachers of various types of educational institutions: nursery schools - 38, primary schools - 46, junior secondary schools - 44, secondary schools - 28, and specialist educational institutions - 16.

The respondents were provided with two identical sets of 40 adjectives characterizing people's attitudes and behaviours (one set for the manager's role, the other for the leader's role). The respondents' task was to choose 5 statements characterizing the role of the leader and then 5 statements characterizing the role of the manager.

The analysis of the collected data consisted in the determination of the frequency of the occurrence of the leader's and the manager's characteristics corresponding to the three types of trust (instrumental, moral and fiduciary), which were a dependent variable. The choice of characteristics corresponding to the dependent variables was based on the descriptions of the content of trust in Sztompka's publications (1999, 2007). Table 1 presents the variables of the content of trust and the characteristics included in the analysis.

Table 1. Variables (trust content) and their description (characteristics of a leader or a manager)

Variable (Trust content)	Description (characteristics of a leader or a manager)
Instrumental trust	With good communication skills, resolute, effective, diligent
Axiological trust	Responsible, honest, truthful, wise
Fiduciary trust	Patient, helpful, understanding, sensitive

4. Results

Expectations with regard to the characteristics of the leader and the manager differ in the respondents' opinions (cf. Table 2). With respect to the leader's role, the characteristics referring to axiological and instrumental trust were mentioned with similar frequency (132, i.e. 46.5% and 130, i.e. 45.8%, respectively). With respect to the manager's role, the most frequently mentioned characteristics correspond to instrumental trust (158, i.e. 56%) and to moral trust (100, i.e. 35.5%). With respect to both roles, the least frequently chosen characteristics were those related to the most risky type of trust, i.e. fiduciary trust (the leader's role - 22, i.e. 7.7%; the manager's role - 24, i.e. 8.5%). The differences between the content of trust and the leader's and the manager's roles are statistically significant ($\chi^2_{(2)} = 7.216$, $p < 0.05$).

Table 2. The content of trust with regard to the leader and the manager

		Trust content			Total
		Instrumental trust	Moral trust	Fiduciary trust	
Leader	N	130	132	22	284
	%	45.8%	46.5%	7.7%	100%
Manager	N	158	100	24	282
	%	56.0%	35.5%	8.5%	100%

5. Discussion / Conclusions

The greater importance of instrumental trust with respect to the manager and axiological trust with respect to the leader seems consistent with the opinions of theoreticians who point out the different nature of the processes implemented by managers and leaders in organizations. Managers are focused on the establishment of stable organizations by coping with the complexities, which can be an explanation of the importance of instrumental trust and such characteristics as conscientiousness, decisiveness and effectiveness, which allow them to develop plans of short-time activities and to implement them. On the other hand, leadership is connected with changes in an organization and coping with such changes, which requires moral trust based on honesty and clear intentions, making it possible for the leader to face the unknown. The interesting thing is a low level of expectations regarding fiduciary trust in both roles, which may be a manifestation of the generally lowering level of trust in schools, as observed by Precey (2012).

References

- Bryk, A.S. and Schneider, B. (2002). *Trust in Schools: A Core Resource for Improvement*. London: Russell Sage.
- Bush, T., Bell, L., & Middlewood, D. (Eds.). (2010). *The principles of educational leadership & management*. Sage Publications.
- Council conclusions on effective leadership in education, Education, Youth, Culture and Sport Council meeting, Brussels, 25-26 November 2013. Retrieved 15.03.2015, from: http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/educ/139715.pdf
- Gosling, J., & Mintzberg, H. (2003). The five minds of a manager. *Harvard business review*, 81(11), 54-63.
- Hickman, C. (1990) *Mind of Manager, Soul of a Leader*, Nowy Jork: John Wiley.
- Kołodziejczyk, J. (2014) *Leadership and Management in the Definitions of School Heads*, ATINER's Conference Paper Series. Retrieved 15.03.2015, from: <http://www.atiner.gr/papers/EDU2014-1021.pdf>
- Kotter, J.P. (1990). *A force for change. How leadership differs from management*. The Free Press, New York.
- Yukl, G. A. (2013). *Leadership in organizations*. Pearson Education India.
- Sztompka, P. (1999). *Trust: A sociological theory*. Cambridge University Press.
- Sztompka, P. (2007). *Zaufanie: fundament społeczeństwa*. Kraków: Wydawnictwo Znak.
- Precey, R. (2012). Leadership and trust in education – the often missing magic glue. *Zarządzanie Publiczne*, Wydawnictwo Uniwersytetu Jagiellońskiego, (4 (20), 9-17.
- Zaleznik, A. (1977). Managers and leader: are they different? *Harvard Business Review*, May-June.

MOBILE SCIENCE: THE ENVIRONMENTAL ISSUES STUDY

**Anelise Leal Vieira Cubas, Marina de Medeiros Machado,
Ana Regina de Aguiar Dutra, Elisa Helena Siegel Moecke,
Ivete Rossato & Rachel Faverzani Magnago**

Unidade Tecnológica, Universidade do Sul de Santa Catarina (Unisul), Palhoça (Brazil)

Abstract

This paper aims to socialize pedagogical practices developed in public schools in the state of Santa Catarina in southern Brazil, which aim to develop the teaching-learning process in high school. The study covering four workshops with topics related to the environment, the work is itinerant and involved the following workshops: Biodiesel production - Students produced biodiesel from saturated frying oil residues and short chain alcohol in a small reactor. In this prototype, chemical transesterification reactions were worked, leading to the transformation of the fat and oil into biodiesel and ethanol. Soap Making - In this workshop was produced soap bars with the following ingredients: saturated frying oil (high acidity), caustic soda, water, glycerine and disinfectant, which was worked saponification reaction. Biofilm Production - this workshop was worked principles of chemical reactions in the transformation process of starches in biodegradable films, using glycerine, co-product of biodiesel generation, as plasticizer. Solar heater - With waste milk cartons, pieces of pipe and PET bottles, a solar water heater was built. In this prototype were applied physics principles related forms of heat transfer and convection. All workshops dealt with the concepts of exact sciences, such as physics, chemistry and mathematics, giving emphasis to environmental issues, mainly related to waste recovery. The results showed that 95% of the students enjoyed participating in the workshops; 76% perceived more easily the relationship between theory and practice in teaching and 52% felt encouraged to go to college in the field of exact sciences, after participating in these projects.

Keywords: *Pedagogical practices; public schools; itinerant science, environment.*

1. Introduction

The Brazilian Curriculum Guidelines indicate that high school should provide young people to acquire knowledge related to scientific preparation and the ability to use different technologies. The use of such content is of great importance to the intellectual development of individuals and the social and economic development of the nation. They allow access to different scientific knowledge, developing the student's ability to research, seek information, analyze them and select them as well as the ability to learn, create, make, rather than simple memorization exercise (Brasil, 2002, p.16).

In this way, students who complete high school should master a wide range of knowledge and skills, to be able to actively join the "knowledge society", assume social responsibilities as conscious and ethical citizen, contributing to the development and transformation of society . Therefore, the Brazilian education for secondary education in public schools is still far from achieving the objective mentioned above, since the reality is not optimistic. Research indicates that every ten students, only one completed the third year of high school with knowledge considered appropriate in mathematics in 2011.

According Ciegliniski (2013), after the announcement of insufficient results of high schools in the latest edition of the Basic Education Development Index - IDEB 2011, the Ministry of Education - MEC plans to modernize the curriculum, proposing the integration of the various disciplines in large areas. The inspiration will come from the National Survey of Secondary Education - Enem, which organizes the curriculum matrices into four broad groups: languages, mathematics, humanities and nature. This is the division that proof of ENEM follows, unlike the traditional model for disciplines such as chemistry, Portuguese, mathematics and biology.

In addition to the results of IDEB, the OECD (2013), Organization for Economic Cooperation and Development, announces the recent results of Pisa (International Student Assessment Program), which places Brazil in 58th place of the 65 assessment of participating countries.

The OECD research shows that 49.2% of Brazilian students can, at most, understand the general idea of a text that addresses a familiar theme or make a simple relationship between what has been read and the general knowledge, where about 0.5 % of students are able to understand an unknown text in form and in content and make an elaborate analysis of the topic. Already in science, the performance of Brazilian students was also below average on par with countries such as Argentina, Colombia, Jordan and Tunisia. Brazil was in this item, behind Chile, Costa Rica, Uruguay and Mexico, but ahead of Peru. However, since 2003, Brazil reached the highest performance in mathematics performance.

This article intends to socialize pedagogical practices developed in public schools in the state of Santa Catarina - Brazil, focusing on high school students. The practices developed aimed to diversify the teaching-learning high school method, through the study of environmental problems and also bring the high school of engineering courses. The effort to bring the high school of engineering courses is significant and important as it is known, by providing statistics, that one student of ten acquire adequate knowledge of mathematics in the 3rd year of high school.

2. Materials e Methods

The study is characterized as exploratory and descriptive and consists of four workshops with topics relating to the environment. The work is itinerant and developed workshops were: biodiesel production, soap production, biofilm production and solar heater.

Biodiesel Production: The students produced biodiesel from saturated frying oil and a lower alcohol (methanol and ethanol) in the presence of a basic catalyst (KOH). The transesterification process was carried out in 1-liter reactor adapted with a condenser and heating system. The transesterification reaction is responsible for the formation of ethyl esters or methyl (biodiesel) and glycerine.

Soap Production: Students produced bar soap, using saturated frying oil with high acidity, caustic soda, water, crude glycerine (co-product of the biodiesel process) and disinfectant. After addition of all ingredients, the reactor mixture was stirred until the formation of the soap mass that occurs from the saponification reaction, which is the basic hydrolysis of lipids (oil) by the addition of a strong base. The bars were formed using *Tetra Pak* milk cartons.

Biofilm Production: To biofilms process aqueous solutions were prepared with manioc starch (*Manihot sp*) and crude glycerine. The solution was prepared in a beaker and heated under stirring until the gelation of the starch. Then the solution was transferred to a Petri dish of 15 cm diameter and brought to air oven for water evaporation and film formation. Glycerine was used as a plasticizer. The biofilm produced is water soluble and biodegradable.

Solar heater: the solar panel was built with *Tetra Pak* milk cartons, 2 litres PET bottles and PVC pipes, was built a solar water heater. The water tank is formed with two "drums" of plastic and has been used rice hulls as thermal insulation.

In the workshops were worked physics content, chemistry and mathematics so that students could approach the theory with practice.

3. Results and Discussion

The pedagogical practices presented in this paper were based on simple solutions to environmental problems, looking towards the students equating the problems by developing projects based on theoretical principles that enabled experimentation, simulation and systematization.

Through workshops held in schools, it was noted that each practice has its peculiarities with regard to the involvement of students, requiring them different skills and expertise for each of the themes. However, the biggest gain with the development of the workshops was related to the theory-practice relationship, which explored a practical way of many of the curricular content matrices, such as mathematics, physics and chemistry, making them most interesting, dynamic content, and especially related to the reality.

Roloff et al. (2013) report that the focus Science, Technology and Society has been presented as a possibility to approach issues involving the scientific nature and technological knowledge and their roles/implications in society. In this context, shall ensure the developed pedagogical practices and referenced by the authors, and the knowledge in general, and knowledge related to the environment, in particular, would provide students means that could assist in the understanding, reflection, and action taken decisions with regard to the developments of science and technology on society and the environment.

Thus, at the end of the development of practices, group dynamics was conducted to know the views of students on the validity of workshops in order to check their impact. In group dynamics were assessed student involvement in the proposed activities and their perceptions about the relationship of the workshops with the content taught in the classroom. It was observed that 95% of students enjoyed participating in the project, 76% perceived the relationship of theory and practice in teaching, facilitating the understanding of the content. It was also found that 71% would like to continue with practical classes, as proposed in the project and that 52% of students felt encouraged to go to college, especially in the area of exact sciences, after participating in these workshops.

It was also possible to notice that the practices aimed at environmental education should cover both scientific knowledge as the subjective aspects of life, including the social representations. In this context, it can be concluded that environmental education should not be to transmit truths, information, demonstrations and models, but rather in action-reflection processes that lead the student to learn by itself, to win these truths and thus develop new understanding of reality strategies.

Another aspect of interest related to environmental education and the environment, perceived in the implementation of environmental practices is the need for efforts to ensure that the activities undertaken aimed at education and awareness, and not simply training. It is noteworthy that information, without the support and the belief that the effort is being developed jointly by government and society, it is little influence to favor action.

With regard to learning and improvement of teachers, it was noted the need for continuous training and / or participation in environmental education workshops, with the aim of expanding its conception of the environment, since the conceptual approaches of the environment and environmental education should not be restricted to the ecological dimension, but associated with a contextualized view of the environmental reality, with emphasis on the effective incorporation of socio-economic and cultural aspects.

4. Conclusions

The application of methodologies worked provided the link between knowledge and action; so the knowledge guides the action, which, in turn, results in the expansion of knowledge of all participants, assisting in the training of citizens more aware and critical of their reality. Worked scientific knowledge increased the ability to search, seek information, analyze them and select them as well as the ability to learn, create, make, rather than simple memorization exercise.

References

- Brasil. Secretaria de Educação Média e Tecnológica. 2000. Parâmetros Curriculares Nacionais: Ensino médio. Parte III - Ciências da Natureza, Matemática e suas Tecnologias. Brasília: MEC/Semtec, 2000. Available in <http://portal.mec.gov.br/seb/arquivos/pdf/14_24.pdf> Acess 12 mar. 2014.
- _____. Secretaria de Educação Média e Tecnológica. 2002. Parâmetros Curriculares Nacionais: ensino médio. Brasília: MEC/Semtec.
- _____. Ministério da Educação. Secretaria de Educação Básica. Diretoria de currículos e educação integral. 2013. Programa ensino médio inovador: documento orientador.
- Cieglinski, A. 2012. Novo currículo do ensino médio poderá ser inspirado no Enem. Available in <<http://educacao.uol.com.br/noticias/2012/08/17/novo-curriculo-do-ensino-medio-podera-ser-inspirado-no-enem.htm>> Acess em: 12 nov. 2013.
- Organização Para Cooperação Econômica e Desenvolvimento (OECD). 2014. O novo critério global para a troca de informações fiscais. Available in: <<http://www.oecd.org/>>. Acess 22 nov. 2013.
- Roloff, F.B.; Marques, C. A. 2013. Questões ambientais na voz dos formadores de professores de química em disciplinas de cunho ambiental. *Química Nova*, Vol. XY, No. 00, 1-7.

INTERPRETATION OF UNIVERSITY QUALITY IN PERSPECTIVE OF TCM

Yanhua Wang

Higher Education Institute of Shenzhen University, Guangdong (China)

Abstract

Recent research in China has been highly focusing on the quality of higher education system, however, few scholars specialize their studies on the quality of university as entities. There have been wide concerns about macroscopic studies of higher education while only little light projected to the internal quality of a university. University is a unique living organism, having irreplaceable life qualities compared with other organizations. This paper makes its effort to create the concepts of university quality by analyzing the core theories of traditional Chinese medicine (TCM), to explore the development of a healthy way of life on universities, hopefully providing a new interdisciplinary research perspective on quality management of colleges and universities.

Keywords: *University quality; traditional Chinese medicine(TCM); harmony.*

1. Introduction

The 21st century is the century of quality. Quality as a philosophy and a culture is gradually penetrated into all aspects of social lives, including higher education. How to analyze the quality of higher education, and how to establish scientific and reasonable concepts of quality of higher education? Scholars from different aspects, in different perspectives have already made systematic studies and exploration. These studies mainly focus on the macro-development issues in the field of higher education system. Their discussions can be summarized as the quality concepts of adaptability, diversity, humanism and development. Over the past decade the research in mainland China shows that people are more concerned about the macro-management of higher education. Very few scholars propose ideas about the QUALITY in a concept of university quality, with concentration on the internal quality management of universities. This paper focuses on the quality of domestic management with features of an academic organization, and regarding and analyzing it as an unique living organism with the help of Chinese medical theories.

2. University Quality Does Not Mean Higher Education Quality

The concept of quality is a concept of value. It is peoples' ideas and conclusions about how to interpret and understand core values of certain things. In early ages the only entity of higher education is university, so when people mentioned higher education they mean university. After the 19th century, universities started to build a closer relationship with society and there were some other higher education entities emerging in addition to universities. Therefore people can no longer refer to the higher education as colleges and universities, and neither do they with concepts of higher education quality and university quality, although both concepts share a lot of similarities.

In order to pay more attention to university quality, we should analyze the organizational features of a university, interpret the characteristics of it and treat it as a living organism. So how can we see it as a living organism?

3. Examine the Specialty of Life Embodied in University Quality in Perspective of TCM

Chinese medicine is a study of life science. It explores the life knowledge, and also provides a way of thinking and its epistemology. All the existing features in a university are explored and mainly described as property of life, peculiarity, independence and autonomy. Let's analyze how to make university develop in a healthy way in perspective of traditional Chinese medicine.

3.1. University Quality Derives from Qi of Life

Chinese medicine believes that man comes from universe and shares some characteristics with the universe. Man should follow the law of the natural 4 seasons. The operation of a university is just in compliance with the idea of life world described by Chinese medical theories. As an exceptional ecological system, Ashby said: "Any type of university is just an outcome of heredity and environment." TCM theory regards it as Qi that refers to the functional force of metabolism. Qi in life is a combination of "essence" and "turbid", and "essential qi" is the source of human mental activity, "turbid qi" is the material basis for the formation of the human body. The life of the body is a combination of "essential qi" and "turbid qi", both are indispensable and indivisible, and both make the living world.

University is an organism with rich "essential qi" which derives from the outstanding history of university culture, university spirit, and university idea. They together make up of the soul and vitality of a university. A university without "essential qi" is only an shell without soul. The "essential qi" is widely infiltrated among the "turbid qi" existing in all the material forms of university such as campus architectures, landscape, sculptures, etc. They keep the spark of life flickering and lasting.

3.2. University Observes the Law of Natural Growth

The way a university develops is much the same way a living creature lives and grows. University is also a living creature with its own life rhythm. Talent cultivation is a growing process throughout all different kinds of younger generations and individuals. All scientific research is a life experience in human spiritual exploration. Cultural inheritance is pursuits of ways how life immemorally existing. Without considering university as an existing of living creature but just a material existing, the quality criteria of university is easily invaded and harassed by instrumental rationality and therefore university quality will be seen as a "product quality" and "quality of service". At last it will destroy the life of university and lead to the spirit distortion of university.

For example, the point that American higher education is in the midst of the crisis has been very popular throughout all the 20th century. The characteristics and nature of the crises are ensuing changes during different ages, but the truth is worth noticing that every time the crises are self-eliminated before we have time to implement the new policy measures, which proves the essence of conscious life process of university, which is naturally corresponded with the harmonious way of life. University as a living creature has the capacity to expel the pathogenic factors and realize self-healing which proves more effective result than implementing compulsory system vicissitude from outside of the system.

3.3. Interpreting University Quality in TCM Wisdom

As for dialectical treatment theory, TCM insists the principle of syndrome first and treatment second, focusing on the overall organic functions and the relations of different elements formed in human body. TCM theory follows the idea of administering prescriptions by ascertaining the causes as well as determining etiologic factors based on differentiations. In terms of the causes TCM disapproves of the linear thinking of "one cause one result", instead it emphasize "one cause multi-results", "one result multi-causes", even "multi-causes multi-results" and "multi-results multi-causes". Dialectical treatment in TCM also favors the clinical treatment principle as "providing symptoms when disease is urgent", "treating root causes when disease is moderate" and "treating both the symptoms and the root causes". These are based on the dialectical ideas of "treatment guidance according to the general trend", treatment accordance with different conditions, treating same disease with different methods and treating different diseases with same method.

The theory of Yin Yang balance is the basic idea of CTM, regarding that Yin Yang imbalance is the primary cause for human diseases and it will strongly affect the development and the changing state of the whole condition. The essential part of TCM diagnosis and treatment is the balance of Ying-Yang waxing and waning. As what was written in Huangdi Neijing (The inner Canon of Huangdi): "Yin and Yang in equilibrium, Spirit and body in good shape." So doctors' duty is to adjust the Yin-Yang balance to keep good balance not only inside part of body but also outside part of body. This is the first principle for TCM treatment.

All these above principles from CTM theories can be tried and adopted by university administrators when dealing with problems from internal management of universities or colleges.

4. New Concept of University Quality in Perspective of TCM Wisdom

4.1. University Quality in Full Ecological Harmony

The essence of TCM wisdom lies in the overall harmony. It focuses on the harmonious and healthy concept of human life. Likewise, university quality advocates the overall healthy and harmony

both inside and outside of university. University together with its interdependence surroundings make up the large complex system while the university itself forms a smaller system. Both systems rely on each other and influence each other and therefore make up another larger system. There will be no good quality if university gets involved in a disordered environment and rigid relationship with outside world.

4.2. University Quality with Self-Generation and Self-Diagnosis

As Dewey said that education is agriculture, the educator is like farmer and he has certain things to do, certain resources with which to do and certain obstacles with which to contend. The conditions with which the educator or farmer deals with have their own structures and operation independently of any purpose of his own and of anyone outside of university. University has its own structures and operation as well. University quality criteria are much the same as the real aims of education, which is simply to utilize the various conditions, to make campus activities and those environmental energies work together. The criteria cannot be imposed from outside or accepted on authority otherwise it will do harm to university.

4.3. University Quality with Reinforcement of Essential Qi and Shen

Different universities have the accumulation of different historical and cultural traditions thus form different university spirits, dispositions, strengths, operating mechanisms and all elements of the environment. These are what TCM describes as the essential Qi and Shen. University that lacks of its own vital essence will lose its vitality and distort the meaning of its existence. Without its own distinct personality and characteristics, university will lose its life value. And they will become the same as most of other business enterprises, social institutions, government organizations or even military organizations. University quality means reinforcing the primordial essential Qi and consolidating Shen, and to inspire arousing restorative quality. The essential Qi of university refers to the healthy operation mechanism inside and outside with the environment, all different parts work together and corporate well to make a harmonious ecological environment. Qi is the greatest motivation to promote the organism growing up going on forward. Shen is the external manifestation of specific functions. It mainly refers to the culture, the spiritual outlook, the cohesiveness of teachers and students in the university. The power of culture is fusing deeply in the vitality, creativity and cohesion in the university.

(There are 3 precious things in heaven: the sun, the moon and the star. 3 precious things on the earth: water, fire and wind. 3 precious things in human beings: Jing, Qi and Shen.)

References

- 1.[English] Ashby university education Technological Society [M] Tengtai Chun, 滕大生 Beijing: People's Education Press, 1983: 07.
- 2.Frank Newman, Laila • Rhea Cote, Jamie • Sige Rui. Future of Higher Education: Fu Yan, reality and market risk [M] Li Qin, translation. Beijing: Peking University Press, 2012: 20)
- 3.Robert Birnbaum • university operating mode [M] Dunrong Bie main translation China Ocean University Press, 2003: 5
- 4.Yang Dongping University Spirit [M] Shenyang: Liao Hai Press, 2000: 113.
- 5.Bill • [Canada] Lei Dingsi ruins university [M] Beijing: Peking University Press, 2008: 66.
- 6.Wang Wang chart diagram "via" speech [M] People's Medical Publishing House, 2008: 150
- 7.Cao Na. TCM thought ancient literature review [D]. Guangzhou University of Traditional Chinese Medicine, 2005
- 8.Yu Mou ChangI, ecological and cultural theory, Shijiazhuang: Hebei Education Press, 2001.83
- 9.Liu Dong. University Concerned [J] University (Academic Edition), 2010 (04): 84-93.
- 10.Feng You Lan. Qinghua twenty-fifth anniversary [M]. // Yang Dongping. University Road. Shanghai: Wenhui Press, 2003.
- 11.Liu Xianjun. Thinking university governance and universities [M] Huazhong University Press, 2000: 57.
12. Yang Fujia. A university president's speech - Heading Chinese University [J]. Monthly basic education, 2006 (01).

A STUDY OF BUSINESS MANAGEMENT EDUCATION BY SIMULATION USING THE BUSINESS GAME

Takao Nomakuchi¹, Suguru Yanata² & Kaori Ishibashi³

¹*Faculty of Economics, Department of Business Management, Wakayama University (Japan)*

²*Faculty of Economics, Department of Economics Wakayama University (Japan)*

³*Wakayama SHIN-AI Women's Junior College (Japan)*

Abstract

In Japan, entrepreneurs have been expected to have the ability to produce new business model ideas based on innovation and their capability as entrepreneurs. However, teaching methods have yet to be established. Business management education that motivates university students to be entrepreneurial and innovative is required for the development of society. The author has implemented a business management educational program in the School of Economics of a National University in Japan. In this program, a business game was implemented based on a business-game computer environment. In this study, we verified the effects of this business game by analyzing student comments after some exercises using a text mining tool. Our analysis confirmed that a variety of business management experiences could be provided. A regular business management education program conducted in the classroom cannot provide this feature. The introduction of this business game into IT-based business management education serves to nurture entrepreneurs.

Keywords: *Entrepreneurship, DNA of Innovation, Business Model, Management education.*

1. Introduction

In this research, we examined the educational effect of a business game on the perspective of entrepreneurship (spirit of entrepreneurs and entrepreneurs' activity) in order to clarify whether a business game would be effective for nurturing strategic entrepreneurs. According to the IMD World Competitiveness Yearbook (2014), Japan was in 1st place of all 59 countries of the survey subjects until 1993. However, since then there has been a gradual decline with Japan being in 21st place as of 2014. This result shows that for some time now Japan has not been considered a competitive international country. This survey indicated a lack of entrepreneurship (55th place as of 2014) as one of the factors for the declining international competitiveness of Japan. The world evaluates Japan as lacking entrepreneurship. Porter (1990) indicated the entrepreneurship of Japanese companies as follows: A new generation of corporate managers is now taking the lead of the industrial world in Japan. In many cases, they are replaced with the former corporate founders and entrepreneurs that established their companies after World War II. In this process there exist risks that foresight and a good atmosphere for business establishment could be lost and that bureaucratism and conservatism could emerge. He also indicated the following issues for Japan.

(1) Absence of corporate managers with entrepreneurship; (2) Organizational design where talented individuals cannot be utilized; (3) Rigid organizations; (4) Fragile system architecture; and (5) Inconsistency in the total business strategy. On the other hand, Kutsuna (2012) mentioned that the companies and corporate managers in Japan lack entrepreneurship and strategic reasoning ability.

2. Previous research

This chapter gives a simple overview of previous studies regarding business-game-based education and the ability of entrepreneurs. With respect to business-game-based education, Shirai (2005) indicated that students would be able to practice business knowledge including marketing, accounting, and logistics through a virtual experience of managing companies on computers by participating in business games as players. By doing so, they would be able to deepen their understanding of corporate management. Additionally, the purpose of his study was that each individual student would analyze

corporate systems through development of business game programs. In order to develop a business game program, the developer needs to model the targeted business. Through this modeling process, students would be able to analyze corporate systems specifically by sorting out major targeted business factors and defining the relationships among these factors. Additionally, the developed business game program could be evaluated or criticized when other players played the program. This process would enable the developer to learn other factors that were unknown to the developer. Furthermore, when multiple students played the completed business-game program as players, the management results could be compared and analyzed. Doing so could analyze the availability of operations in the relevant business model.

Fukuda (2006) formed a hypothesis that only students who finished their study of economics would be able to understand the business model of store management handled in a game, while students who could not understand the business model would be poor at playing the business game program. However, this hypothesis was not necessarily supported in his study. In other words, there was no correlation observed between the game performance of the students and their understanding level of economics. For this reason, he said that the current economics taught in Japan actually does not have any educational effect regarding the qualities that entrepreneurs should possess.

With respect to disruptive innovation ability that is required for entrepreneurs, Christensen et al. (2011) indicated the importance of the following five skills: "Associating skill," "Questioning skill (to ask questions about objections to the actual conditions while being passionate to explore objects)," "Observing skill (to observe the surrounding world carefully in order to get insight or ideas that bring about new methods)," "Networking skill (to find out or attempt new ideas through a broad range of networks with others having diverse backgrounds and thoughts)," and "Experimenting skill (to challenge a new experience and attempt new ideas)." Fig. 2 shows the model called "Innovator DNA" in order for entrepreneurs to produce innovative ideas. The next section verifies the effect of a business game by using the innovator DNA model.

3. Discussion

The School of Economics of Wakayama University utilized a business game program provided by the School of Management of the Yokohama National University, called the bakery game, in a database management class. In this bakery game, teams with players acted as bakery managers that determine the sales price of bread, the number of orders of bread dough, and the amount of bread baked. Ten teams competed in the game based on their business performance. Each team was graded based on their surplus funds. Each team competed with other teams in the common market with regard to their performance based on surplus funds or profit. The purpose of this game is as follows: (1) to experience the essence of corporate management, (2) to experience the decision-making process as a group, (3) to understand the profit and loss structure and utilize its concepts. In this study, we conducted this game by dividing the students into 10 teams with 4 to 5 members each. Afterwards, we had them submit written descriptions of their impressions about this game. In the end, 24 students submitted their descriptions. Giving consideration for proper handling of personal information, we combined these written descriptions while hiding information that could identify an individual student and then conducted text mining. The self-organizing map in Fig. 1 shows the results. This self-organizing map is a neural network algorithm not including teachers. This is a data analysis method that maps high-dimensional data on a 2D plane non-linearly. On this map, the innovator DNA proposed by Christensen et al. (2011), Entrepreneurship and Strategy thinking are mapped. Additionally, these skills described above are also mapped.

Figure 1. The Self-Organizing Map of Business game Impressions



Fig. 1 shows us that this business game corresponds to the five skills of innovation DNA. Moreover, it demonstrates that the participants can find joy in joining in corporate management and developing strategic reasoning. Additionally, this result indicates that the participants can enjoy such an experience that differs from any of the projects offered by the School of Economics.

4. Conclusion

From the point of view of the five skills as innovation DNA that Christensen et al. required of entrepreneurs, we were able to confirm that business game programs such as bakery game are actually essential for education of future entrepreneurs. Additionally, we also clarified that students would be able to experience virtual corporate management that cannot be explained in any subject offered in the School of Economics, while they could taste the enjoyment and a little difficulty related to business. The future issue of this study is to clarify the implementation methods of business game programs that can enhance the effects of business games for education.

References

- IMD(2015). *The IMD World Competitiveness Yearbook 2014*. Retrieved May 10, 2015, from http://www.conicyt.cl/wp-content/uploads/2014/07/IMD_WCY-2014.pdf.
- Porter (1990). *The competitive advantage of nation*, New. York: Free Press.
- Kutsuna, Kenji(2012). *Challenge to the global leader training (2) -serious Japan of entrepreneurship over strategic entrepreneur of training is of urgent challenges-*. Daiamond Online No.47, 14th,September,2012, Retrieved May 10, 2015, from <http://diamond.jp/articles/print/24790>.
- Shirai, Hiroaki (2005). *Model notation for business game*, Yokohama Business Administration ResercVol.26,No.2,pp.85-97.
- Fukuda,Masahiro(2006). *Business Game and Mathematical-Social Understanding(2) — Game performance of the Lower Secondary School Students befbre leaming Economics in Social Studies —*. Bulletin of Faculty of Education, Nagasaki University Curriculum and Teaching, No.46, pp.17-25.
- Cristensen,C. & Dyer,J. & Gregersen,H.(2011). *The Innovator's DNA: Mastering the Five Skills of Disruptive Innovators*. New York: Harvard Business Review Press.

HAVE PSEUDOSCIENCES LAID ANCHOR IN BOOKSHOPS OF QUEBEC? A LONGITUDINAL STUDY

Serge Larivée¹, Carole Sénéchal² & Dave Miranda³

¹*School of Psychoeducation, Montreal University (Canada)*

²*Faculty of Education, Ottawa University (Canada)*

³*School of Psychology, Ottawa University (Canada)*

Abstract

In this communication, we present the results of a longitudinal study on the proportion of space devoted, on the one hand, to books of pseudosciences (paranormal, the occult, new age, methods of divination, etc) and of sciences for adults; and on the other hand, on the proportion of space devoted to books of spirituality and sciences for children in the bookstores of Quebec. Two measures were taken, one in 2001 in 55 bookstores, and the other one in 2011 in 72 bookstores. Statistical analyses were conducted only on the measures taken in the bookstores that were visited at the two measurement times. Results from correlational analyses show that those bookstores that devote more space to books of pseudosciences for adults ($n = 40$) and to books of spirituality for children ($n = 38$) are the same in 2001 and 2011. Moreover, a repeated measures ANOVA indicate that the proportion of space devoted to books of pseudosciences for adults had decreased at the second measurement time, which is not the case for books of spirituality for children. After briefly revisiting the methodology and results, we put forward four reasons that may explain the popularity of pseudosciences, as well as a few ethical and social consequences from their fashion. In our concluding remarks, we suggest two solutions to promote scientific reasoning among adolescents and children.

Key words: *Bookstores, pseudosciences, science, longitudinal study*

1. Purpose of this study

If libraries are often considered as havens of culture and knowledge, the displaying publications that will sell easily such as books dealing with esoteric and paranormal subjects can sometimes account for more than half of the business's turnover. Thus, observing the space occupied by these books in libraries can inform us on the relevance of sciences and pseudosciences in society. The purpose of this research is two-fold. Firstly, we wanted to verify if, on a 10-year interval, librarians were to change their position in regard to the place reserved for pseudosciences on their bookshelves. Secondly, we wanted to substantiate our findings by verifying whether pseudosciences gained or lost ground in that same timeframe.

2. Methodology

2.1. Subjects

The subjects of this study are the libraries per say. At both measures, common, large surface libraries were favoured. Contrarily, university or theme-based libraries often dedicated to a particular theme such as religion or esoterism were left out because of the limitations induced by their targeting of specific populations.

In the case of books aimed at the adult clientele, two categories were considered: sciences and pseudosciences. In essence, under the heading "sciences", one can find books devoted to scientific popularisation of particular disciplines or to the functioning and history of a distinct subject in science. Under the "pseudosciences" header, we regrouped the following literature: esoterism, paranormal, astrology, new-age, divinatory arts, personal growth, popular psychology, spirituality (to be distinguished from religious studies) and alternative medicine.

As far as children's books are concerned, two categories were withheld: sciences and spirituality. Under the heading "sciences", we considered books dedicated to the initiation to sciences and technology,

history, major discoveries, astronomy, the theory of evolution, and lastly, the subject of animals. The decision to use a header titled “spirituality” as analogous to “pseudosciences” seemed justified since, amongst adults, spirituality and esoterism are regrouped in the same category.

2.2. Procedure

During the summers of 2001 and 2011, equipped with a measuring tape, we toured the province of Quebec in order to evaluate the space occupied in centimetres by sciences and pseudoscience’s publications dedicated to adults, and by sciences and spirituality books destined to children (see Figure 1). As for the books for adults, 55 libraries were visited in 2001 and 72 in 2011. For the publications aimed at children, 50 libraries were visited in 2001, and 72 in 2011. Some libraries could not be visited at both measures.

Figure 1. Procedure for the collection of data in libraries of Quebec.



3. Results

Table 1 illustrates the average proportion (%) of space reserved in centimetres (cm) to pseudoscience publications in relation to those dedicated to sciences, amongst books targeted towards adults. Similarly, it displays the proportion of space occupied by books about spirituality in relation to science publications amongst books targeted towards children in libraries of Quebec in 2001 and 2011.

Table 1. Average proportion of space to pseudoscience in relation to sciences

Publications	2001			2011		
	N	M (%)	S. D.	N	M (%)	S. D.
Adults	55	89,07	7,31	72	86,49	8,60
Children	50	10,05	7,00	72	10,10	14,55

When evaluating the temporal evolution of the space occupied by sciences compared to pseudosciences and spirituality, we only used the data obtained from libraries which were visited at both measures. The subject of the analysis is the percentage of space (cm) occupied by pseudoscience publications offered to adults ($N = 40$) and by books dealing with spirituality in the children’s book section ($N = 38$). First and foremost, correlations (Spearman’s rho) were calculated in order to verify the inter-library stability of the differences in between 2001 and 2011. Those correlations allowed us to see if the ranking of the libraries depending on the space reserved to pseudosciences remained constant over time. Next, analyses of variance (ANOVAs) with repeated measures were completed in order to verify if the proportion of space dedicated to pseudoscience publications for adults and to books about spirituality for children remained the same over time.

3.1. Libraries for adults ($N = 40$)

The correlation coefficient indicates that the proportion of space reserved to books dealing with pseudosciences in 2001 is significantly and positively correlated with that of 2011: $r(40) = .73$, $p = .001$. During the last decade, the inter-library differences remained stable since the libraries that devoted more space to pseudosciences in 2001 were generally the same 10 years later, in 2011. Furthermore, the repeated measures ANOVA shows that the proportion of space dedicated to pseudosciences in 2011 ($M = 86.07$; $E.T. = 8.67$) diminished significantly in comparison to that of 2001 ($M = 88.84$; $E.T. = 7.18$): $F(1, 39) = 8.94$, $p = .005$. If the space attributed to pseudosciences did indeed decline, the latter never dropped below the rather high percentage of 85 %.

3.2. Libraries for children ($N = 38$)

The correlation coefficient indicates that the proportion of space reserved to books dealing with spirituality in 2001 is significantly and positively correlated with that of 2011: $r(38) = .35$, $p = .03$.

During the last decade, the inter-library differences remained stable since the libraries that devoted more space to pseudosciences in 2001 were generally the same 10 years later, in 2011. Furthermore, the repeated measures ANOVA shows that, on average, the proportion of space dedicated to pseudosciences in 2011 ($M = 7.62$; $E.T. = 6.57$) does not significantly differ from that of spirituality books in 2001 ($M = 9.17$; $E.T. = 5.59$): $F(1, 37) = 1.57$, $p = .219$. Overall, as illustrated by the lower portion of Figure 3, despite an apparent decline in the last decade, libraries seem to have maintained a generally stable proportion of space reserved for books of spirituality targeted at children.

3.3. What about the number of centimetres?

We also wanted to find out how the total space occupied in centimetres varied depending on the categories of publications. For the books dedicated to adults, a repeated measures ANOVA indicates that, on average, the number of centimetres reserved for pseudosciences in 2011 ($M = 5632.60$; $E.T. = 3451.11$) is not significantly different than the number of centimetres for the same category of books in 2001 ($M = 5018.25$; $E.T. = 4144.69$): $F(1, 39) = 1.51$, $p = .23$. The same findings apply to science publications for which the average of centimetres in 2011 ($M = 941.28$; $E.T. = 1017.42$) does not significantly differ to that of science publications in 2001 ($M = 798.83$; $E.T. = 1296.14$): $F(1, 39) = 2.23$, $p = .14$.

For the books dedicated to children, a repeated measures ANOVA indicates that, on average, the number of centimetres reserved for spirituality in 2011 ($M = 102.89$; $E.T. = 93.96$) is not significantly different than the number of centimetres for the same category of books, but in 2001 ($M = 116.74$; $E.T. = 97.76$): $F(1, 37) = 0.90$, $p = .35$. The same findings apply to science publications for which the average of centimetres in 2011 ($M = 1585.92$; $E.T. = 1750.92$) does not significantly differ to that of science publications in 2001 ($M = 1253.07$; $E.T. = 980.63$): $F(1, 37) = 1.69$, $p = .20$.

4. Discussion

Why are pseudosciences best sellers? In previous studies, we have already evoked some of the reasons underlying their popularity (Larivée, Sénéchal, Miranda et Vaugon, 2013). Therefore, we will only highlight one: *believing is an important bias that has its origin in the fundamental functioning of the human brain*.

In order to function properly, the human brain needs coherence and logical information. To the effect, it is undeniable that pseudosciences and esoterism exert a powerful attraction, a belief often representing the path of least resistance towards the integrity of information (Gazzaniga, 1996). Additionally, the literature dealing with paranormal and esoteric subjects indicates that the individual need to believe encourages the abolition of limitations in what can be invented to sell purpose and comprehension. To a certain extent, it does not matter if the phenomena is true or false, since what is important is whether or not the explanations are satisfying on the affective and cognitive level (Abrassart, 2010). That being said, above and beyond are senses, beliefs allow the elaboration of a meaning in regard to what happens to us, or what is bound to happen in the future. In fact, beliefs don't need facts to function (Larivée, 2009).

Lastly, we can consider that books which are published in the pseudoscientific universe are an attempt to offer immediate answers which require little effort. Since many individuals hold a view of the world that includes superstitions and irrational thoughts, it is probable that those unfounded beliefs may appear reasonable and not particularly disadvantageous. Therefore, why change? Ultimately, belief systems have always had precedence over reason, hence the tendency to try and find arguments and facts that confirm our own beliefs and, in the same vein, to ignore facts which contradict them (Carroll, 2011; Shermer, 2011).

References

- Gazzaniga, M. (1996). *Le cerveau social*. Paris, France: Odile Jacob.
- Larivée, S., Sénéchal, C. Miranda, D. et Vaugon, K. (2013). Études longitudinales à propos de l'espace occupé par les pseudosciences dans les librairies du Québec. *Revue de psychoéducation*, 42(2), 395-418.
- Larivée, S. (2009). Croire: une tendance lourde. *Sciences et pseudo-sciences*, 284, 16-22.
- Shermer, M. (2011). *The believing brain: From ghosts and gods to politics and conspiracies. How we construct beliefs and reinforce them as truths*. New York, NY: Times Brook.

Virtual Presentations



THE QUALITY CHAIN IN EDUCATION – A GRID APPROACH

Dimitrios A. Giannias & Eleni Sfakianaki

School of Social Sciences, Hellenic Open University (Greece)

Abstract

Based on the concern for people and the concern for production, Blake and Mouton (1964a) presented the managerial grid model which explored five leadership styles. Ever since, the theory developed further to include more leadership styles and a new component; that of resilience. Blake and Mouton introduced the Sales Grid, an evaluative tool that is largely used in the sales sector. However in principle the managerial grid is potentially applicable to a variety of contexts such as sales, supervision, media, personal etc. In essence it is suitable to any human activity that involves at least two parties and the production-supply of a product or service. In practice the managerial model is illustrated as a grid with two axis – one representing the concern for the production and the other the concern for people. The present research investigates how this model can be applied in the quality chain of education using basic principles of total quality management. In this respect the parties involved in the educational quality chain are basically the teachers/professors and the pupils/students and the product/service is education. The aim ultimately is, to examine the potential for improving the educational quality chain but also provide personal improvement to all parties involved.

Keywords: *Quality chain, education, total quality management, grid model, improvement.*

1. Introduction

It is widely accepted that the success of an organisation largely depends on the quality of its leaders, selecting the most capable people and placing them in those positions to which they are best suited, constitutes the cornerstone of the managerial process (Bush and Jackson, 2002). The role of the leader is equally important in the educational sector because the leader shoulders the primary coordination of all the forces at work within an educational unit. Research into school leadership and headship has increasingly shown that effective school management depends on the school leaders (Camburn, Rowan & Taylor 2003; Crowther 2003; Waters, Marzano & McNulty 2003). Retna (2011) stresses that the school head is still considered the main source of leadership and direction in a school whereas Fullan (2007) explains that the head is the key and fundamental factor in the changes and reforms that take place in schools.

The critical nature of this role requires schools but also any educational institute to be led by competent individuals who will ensure the appropriate conditions so that teachers/professors can satisfactorily perform their work and the learning process can be effectively promoted. Research with similar results is presented by Mendels & Mitgang (2013) who show that there is a strong initiative in the US to bolster school leadership since new evidence has demonstrated the extent to which school heads can enhance teaching and learning. Louis, Leithwood, Wahlstrom & Anderson (2010) take this a step further, and claim that the quality of the school leader can make a real difference in the classroom because their research has demonstrated that leadership is second only to teaching among the school-related factors that influence learning.

Considering the high expectations and demands that leaders in education face, school and educational leadership has been the object of importation of management and business models for many decades. In the present paper we examine the managerial grid model developed by Blake & Mouton (1964a, 1964b, 1968); a situational leadership model which originally identified five different leadership styles based on the concern for people and the concern for production. The grid theory continued to evolve and developed two additional leadership styles and with a new element, resilience (Blake & Mouton, 1984, Blake & Mouton, 1985). The managerial model is represented as a grid with concern for production as the x-axis and concern for people as the y-axis; each axis ranges from 1 (Low) to 9 (High). The resulting original leadership styles which are shown on the grid are:

- The indifferent style (1,1): evade and elude;

- The accommodating style (1,9): yield and comply;
- The dictatorial style (9,1): control and dominate;
- The middle-of-the-road style (5,5): balance and compromise;
- The sound style (9,9): contribute and commit.

The opportunistic style (exploit and manipulate), and the paternalistic style (prescribe and guide) were added to the grid theory at a later stage (Blake & Mouton, 1984; Blake, Mouton, & McCanse, 1989). Through this managerial model, an analytical approach has been developed that is suitable for a variety of contexts (e.g., sales, supervision, media, and marriage). Practically, this approach can be applied in any human activity that concerns at least two persons and the production-supply of a product or service; within this context Blake and Mouton introduced the Sales Grid, an evaluative tool that is extensively used for assessing the techniques used by sales representatives (Blake, Mouton & Allen, 1987).

Giannias & Sfakianaki (2015) have introduced and defined the teachers' styles within a grid framework. However, in the analysis of an educational environment the teachers' styles should be viewed and analyzed in relation to the various classroom behaviors; the various types of classroom behavior are reviewed in this paper. It is acknowledged that there is a plethora of management and business models applied in the educational context. The examination however of these models is beyond the scope of the present research. The purpose of this paper is to examine the model proposed by Blake and Mouton (1964a) with a fresh view in the context of quality in education and more specifically within the context of the customer-supplier chain as further described below.

2. Total quality management and education

Quality is generally a popular idea a long time now. In the US there is the Malcolm Baldrige Award, in Japan the Deming Prize, in Europe the European Foundation for Quality Management (EFQM) has developed the European Quality Award to mention some of the well-known quality awards and standards, whereas in a more international level, there is the International Standard ISO9000 series. All these have been introduced in recent years to promote quality and excellence in a wide range of industries and services.

The adoption of Total Quality Management in education is relatively recent. In recent years educational units are required to examine and review such practices to ensure that they offer quality services. Much of the work on TQM and education started from the US and the UK (Sallis, 2005) from 1990 and onwards. One of the difficulties in applying TQM in education is the intangibility of the service provided and the transformation towards the client-oriented culture. However the heart of the difficulty is the definition of the basic principles of TQM such as the quality chain. The concept of the customer-supplier chain in the education sector is debatable since it has a commercial tone that is not considered as appropriate for such an area and thus the word client is preferable as a milder approach to the receiver of service.

In a broad definition, although there are many and different classifications due to the diversity of parties involved, in education the product/service is the education, advice, assessment, guidance that is offered to the pupils/students; the supplier, depending on how wide the system examined is, is the school, the educational unit in general, the teacher/professor, the head of the unit and the administration staff. Finally the client is, again depending on how wide is the system under examination, the pupil/student, the parents, sponsors, employers and the society in the wider context. Further discussion on the distinction between primary and secondary client, internal and external client and stakeholders is beyond the scope of the present research. The aim ultimately is, to examine the potential for improving the educational quality chain but also to provide a framework for personal improvement to all parties involved.

3. The grid model in education

To present our model we take the view that «teachers» and «learners» are involved in the education quality process. Both terms are used in their widest sense, and are specified according to the level of education considered. For example, if the model is applied at the third (university) level education system, the «teachers» are «professors» and the «learners» are «students».

Following a behavioral approach, the characteristics of successful teachers have been introduced in Giannias & Sfakianaki (2015). Therein, two fundamental drivers of teachers' behavior have been identified:

- concern for providing education («getting the job done»), and
- concern for the learners (as people)

These two fundamental drivers of teachers' behavior imply the classification, which is illustrated in Table 1. A teacher's type is specified by a pair (X,Y) numbers («scores»), where X is a measure of a

teacher's concern for education, and Y is a measure of a teacher's concern for learners. Both X and Y range from 1 (Low) to 9 (High). In our model (X,Y) specify the type of a teacher behavior.

Table 1. The Teacher's Grid

<i>Teacher's concern for learners</i>								
1,9								9,9
				5,5				
1,1								9,1
1	2	3	4	5	6	7	8	9
<i>Teacher's concern for education</i>								

Giannias and Sfakianaki (2015) identify the following types of teachers' behavior. The bottom right corner of the grid represents a (9,1) style of teaching - maximum concern for the efficient accomplishment of education, but minimum concern for human relationships with learners. This pattern corresponds to the old style of authority-based teaching, which is characterised by command and control of the class.

The dictatorial (9,1) style of teaching finds learners' needs unimportant; they provide learners with a lot of educational material and expect performance in return. Teachers using this style also pressure learners through rules and punishments to achieve education. In crisis' cases, this dictatorial style is occasionally used by other teaching styles.

The (1,9) position at the top left, in contrast, focuses on human relations with learners at the cost of efficient education, and has been called the «nursery school» style of education. The style (1,9) is based on the principles: yield and comply. This style has a high concern for people and a low concern for production. (1,9) types of teachers pay much attention to the security and comfort of learners, in hopes that this will increase their performance in class. The resulting atmosphere in a class with a (1,9) teacher is usually friendly, but not necessarily very efficient in terms of education.

(1,1) teaching - minimum concern for either production or people - is characterized by a desire to avoid responsibility, and exert minimum effort. The indifferent, style (1,1), teaching is characterized by: evade and elude. In this style, managers have low concern for both people and production. Teachers use this style to preserve job and job seniority, protecting themselves by avoiding getting into trouble. The main concern for the manager is not to be held responsible for any mistakes, which results in less innovative decisions or activities.

The 5,5 manager attempts to maintain a balance between both concerns. The status quo or middle-of-the-road style (5,5) is characterized by: balance and compromise. Teachers using this style try to balance between the goal of education and learners' needs. By giving some concern to both learners and education, teachers who use this style, hope to achieve suitable performance but doing so gives away a bit of each concern so that neither education nor learners' needs are met.

The (9,9) type of teaching integrates maximum attention to both learners and education and is put forward as the most effective approach. The sound, team style of (9,9) teaching is characterized by: contribute and commit. In this style, high concern is paid both to learners and education. A teacher choosing to use this style encourages teamwork and commitment among learners. This method relies heavily on making learners feel themselves and being constructive parts of their class.

4. Classroom behaviors

Teachers cannot predict the specific behavioral issues they will need to address in class. In some instances, they may experience few disruptions or problems and in others, it may seem as though every

learner is devising a way to distract, disturb, disrespect, or otherwise cause problems for their fellow classmates and teachers.

McKeachie & Svinicki (2014) identify four types of challenging behaviors that students may exhibit in a classroom. The effectiveness of each type of teacher with respect to managing these behaviors in a constructive manner is an issue that empirical research must address. The four types of classroom behavior of McKeachie & Svinicki (2014) are the following:

- The attention-seeking, discussion-dominating student; these students want to be heard and they want to be heard often.
- The inattentive student; students who are apt to drift off into their own thoughts, stare into their smartphones, or talk with classmates in the middle of your lecture.
- The unprepared student; students who make a habit of skipping the reading, viewing, listening, or other assignments intended as pre-class work.
- The uncivil and disrespectful student; students who disrespects the time, feelings, and thoughts of you and their fellow students, their rude behavior has a negative impact on the entire class.

An empirical analysis of the combinations of Giannias and Sfakianaki (2015) teachers' styles and of McKeachie & Svinicki (2014) classroom environment would be a valuable input for quality improvement in education and for an evaluation of the different teaching styles. Towards this direction, however, a Grid based typology of learners' styles might be more appropriate. This typology is presented in next section.

5. The Learners' grid

Following the above approach the learners' grid is specified in Table 2; this is represented, too, as a grid with concern for education as the x-axis and concern for teachers as the y-axis.

Table 2. The Learner's Grid

<i>Learner's concern for teachers</i>								
1,9								9,9
				5,5				
1,1								9,1
1	2	3	4	5	6	7	8	9
<i>Learner's concern for education</i>								

More specifically, the two variables of 'concern for education' and 'concern for teachers' are plotted on a grid (Table 2) showing nine degrees of concern for each, from 1 indicating a low level of concern, to 9 indicating a high level of concern. Five positions on the grid represent five differing behavior patterns of learners. In Table 2 the following learners' styles are identified as follows:

Location 9,1 (The Push Education Orientation): The 9,1 behavior, located in the lower right corner of the learners' grid: this approach involves a complete concern for education with little or no regard for the teacher.

Location 1,9 (The Teacher Orientation): The 1,9 behavior, located in the upper left corner of the learners' grid: this approach involves little or no concern for the education and maximum concern for the teacher.

Location 1,1 (understand it or Leave it): The 1,1 behavior, located in the lower left corner of the learners' grid: this approach involves little or no concern for both education and the teacher.

Location 5,5 (The Educational Routine Orientation): The 9,9 behavior, located in the middle of the learners' grid: this approach involves average concern for the education and average concern for the teacher.

Location (9,9) (The Problem Solving Orientation): The 9,9 behavior, located in the upper right corner of the learners' grid: this approach involves maximum concern for the education and maximum concern for the teacher.

6. Conclusions

A classroom behavior typology may be combined with the Grid based teachers' classifications to analyze and improve the quality of learning within a specific educational environment in the context of the supplier-client chain and the wider context of total quality management in education. Towards this direction the introduction of the learners' grid provides an alternative approach for analyzing and improving the quality of the educational chain within a specific educational environment. An advantage of the proposed grid based approach is that it can capitalize on existing knowledge (originated from management) to develop diagnostic tests for identifying (through empirical research) the teachers' and learners' types within a specific educational environment.

References

- Blake, R. & Mouton, J. (1964a). *The Managerial Grid: The Key to Leadership Excellence*. Houston: Gulf Publishing Co.
- Blake, R. & Mouton, J. (1985). *The Managerial Grid III: The Key to Leadership Excellence*. Houston: Gulf Publishing Co.
- Blake, R. & Mouton, J. (1968). *Corporate excellence through grid organisation development*. Houston, Texas: Gulf.
- Blake, R. & Mouton, J. (1984). *Synergogy: a new strategy for education, training and development*. San Francisco, Calif.: Jossey Bass.
- Blake, R. and Mouton, J. (1964b). *The managerial grid: key orientations for achieving production through people*. Houston, Texas: Gulf.
- Blake, R., Mouton, J. & Allen, R. (1987). *Spectacular teamwork: how to develop the leadership skills for team success*. London: Sidgwick and Jackson.
- Blake, R., Mouton, J. & McCanse, A. (1989). *Change by design*. Reading, Mass.: Addison Wesley.
- Bush, T. & Jackson, D. (2002). A Preparation for School Leadership International Perspectives. *Educational Management and Administration*, Vol. 30(4), 417-429.
- Camburn, E., Rowan, B. & Taylor, J.E. (2003). Distributed leadership in schools: The case of elementary schools adopting comprehensive school reform models. *Educational Evaluation and Policy Analysis*, Vol. 25 (4), 347-73.
- Crowther, F., (Ed.). (2003). *Teachers as leaders in a knowledge economy*. Canberra: College Yearbook, Australian College of Educators.
- Fullan, M. (2007). *The new meaning of educational change*. New York: Teachers College Press.
- Giannias, D. A. & Sfakianaki, E. (2015). The Educational Grid. *INTED2015 Proceedings*, 9th International Technology, Education and Development Conference, March 2nd-4th, Madrid, Spain, pg. 5535-5538.
- Louis K. S., Leithwood K., Wahlstrom K. L. & Anderson S. E. (2010). *Learning From Leadership: Investigating the Links to Improved Student Learning, Final Report of Research to the Wallace Foundation*. Publisher: Center for Applied Research and Educational Improvement, Ontario Institute for Studies in Education University of Toronto.
- McKeachie, W. J. & Svinicki, M. (2014). *McKeachie's Teaching Tips: Strategies, Research, and Theory for College and University Teachers*. 14th ed. Belmont, CA: Wadsworth, Cengage Learning.
- McKee, R. & Carlson, B. (1999). *The Power to Change*. Austin, Texas: Grid International Inc.
- Mendels P. & Mitgang L. D. (2013). Creating Strong Principals. *Educational Leadership*, Vol. 22, April.
- Retna S. K. (2011). The relevance of 'personal mastery' to leadership: the case of school principals in Singapore. *School Leadership and Management*, Vol. 31(5), 451-470.
- Sallis, E. (2005). *Total Quality Management in Education*. (3rd edition). Taylor & Francis e-Library.
- Waters, J. T., Marzano, R. J., & McNulty, B. A. (2003). *Balanced leadership: What 30 years of research tells us about the effect of leadership on student achievement*. Aurora, CO: Mid-continent Research for Education and Learning.

FOUR LEGGED TEACHERS. WHAT ABOUT ANIMAL AS TEACHER?

Alessia Gallo, Laura Rio & Filippo Gomez Paloma

Department of Human, Philosophical and Education Science, University of Salerno (Italy)

Abstract

In the last years, we often hear about “pet therapy” or educational, rehabilitative and therapeutic process conducted with the interaction and the relationship between man and animal. The child psychologist Boris M. Levinson (1964) noticed that when his “canine co-therapist” was in sessions, his presence softened children’s defences and provided a focus for communication. In this project, we dealt with Animal Assisted Psychomotor Therapy (AAPT), which is based primarily on the area of movement for the recovery of the cognitive sphere and then the acquisition of motor patterns and autonomy (Piccinno, 1999).

The purpose of this project was to try to overcome the simplistic conception that "animals are good for man" and turned it into a concrete operational proposal, above all by understanding how and how many facilities are available to follow this therapeutic program towards these new ways of learning. In order to understand whether this was well accepted in the educational programs in Salerno (Campania, Italy) schools, there were made structured interviews with multiple choice questions to parents and teachers to understand the degree of information received in the field of AAPT and their opinions about it. The interviews showed a variety of opinions: who already had the opportunity to interact with pets considered interesting to combine the AAPT to the teaching programs, others, instead, believed the proposal completely useless despite knowing the benefits of the method.

In conclusion, the AAPT is still struggling to enter into the collective imagination as a concrete operational proposal to apply to schools because of lacking and superficial information, so more researches are needed.

Keywords: *Pet therapy, Animal Assisted Psychomotor Therapy, Learning.*

1. Introduction

In recent years, we often hear about pet therapy. The first who coined this term was the child psychologist *Boris Levinson* who since 1960 began, coincidentally, to observe the benefits of the company of animals in the relationship between child and psychologist and in 1964 he inserted for the first time the term "pet therapy" in his book "*The dog as co-therapist*", then in 1969 he developed the theory of "Pet-oriented child Psychotherapy", based on the idea that the child frequently identifies himself with the animal, which becomes a transitional object and thanks to this projection type, he can speak more easily about his life and of his worries. The novelty of Pet-therapy is precisely to use an animal as a mediator between patient and therapist and it is mainly based on the relationship that develops between the animal and the patient.

The use of the “pet” as a mediator is very important, since it has its non-discrimination characteristic of the individual and involving him in therapy. In 1975, the couple Samuel and Elizabeth Corson, two American psychiatrists, began to apply the pet therapy to adults with psychiatric problems and to old people who had been admitted to geriatric facilities and they show that animals stimulate natural human tendencies as: the desire to receive affection, protection and support and offer spontaneously attachment and confidence. The two scholars claimed that one of the main successes of the “Pet facilitated therapy” was that it developed in the patient a sense of trust, responsibility and self-respect, by helping him to become aware of his own limitations and creating a sense of independence and responsibility. It progressively transformed the psychic dependence in an individual consciousness too. Hence, the definition of the dog as a "facilitator relational and additional therapeutic tool." At the same time, in the United States, there were the first programmed attempts of pet therapy in mental criminals and prisons. In 1977, Aaron Katcher and Erika Friedmann, two US researchers, began applying Pet-therapy to treat cardiovascular diseases and they noting that in a group of people who have a stroke,

the patients who had a dog had more chance of survival than others. In 1977 in USA it was founded the Delta Society, an organization designed to promote the use of animals for improving the health, independence and quality of human life. According to this company, pets can be included in activities and assisted therapy programs, each animal must also have certain requirements to be able to deal with situations "abnormal", such as patients with a particular mode of communications, clumsy in contact, subject to swings "mood or aggressive". Therefore the co-therapists must be a patient animal who do not manifest aggressive reactions. In the United States, as a result of the research conducted by the scholar Frank R. Ascione in the 80s, the Pet-therapy was introduced in schools with a program called "Humanitarian Environmental Education", which involves the care and respect for all living creatures in the world. In 1992, some Australian researchers show that the owners of pets have lower blood pressure, cholesterol and triglyceride levels much lower than those without pets. In Italy now the involvement of animals as an adjunct of the standard treatments is consolidating and is no longer prescribed exclusively to people with disabilities, even if they are the first users of this therapeutic methodology, but it is starting to grow even toward those who have interventions need to include or social integration (for example: elders, children and people with problems of socialization as prisoners, drug addicts...) and children with autism. As it is claimed by E. Del Negro, in pet therapy there are two important mechanisms of action: the first concerns the affective nature, because it arouses in a person strong emotions; the second concerns the playfulness of this therapy, as the animal interacts positively with the patient through the game, which leads to a psychosomatic effect in the person. Michielin E. believes that the methodological foundation of the interventions is based on the relationship between animals and people in need, through new ways of interaction with otherness animal that assumes the function of medium of education. In addition, pet therapy, lean on medicine and psychology, it also lay the foundations for its methodology on special education, because:

- It uses an active pedagogy to learn the patient the affectivity and the discovery of his body by comparing himself to the animal;
- It allows the subject to have other references and knowledge of the reality around him using the animal as a reference point;
- The meeting between operator and patient aims to leave a memory and emotions in the latter, and to create a reciprocal change between the two people in therapy.

Obviously, the animal must possess certain characteristics. Like humans, each animal has its own character and not everyone is predisposed to this way of working. The pet must be patient and mild, as there is the possibility that the patient suffers from some exuberant attitude. Furthermore, when we work with these mediators, we must consider the temperament and the characteristics of the species because, during the pet therapy, the animal is subjected to an enormous stress factor, since it must adapt to the patient's behavior. Consequently, it is appropriate to have moments of rest, during which it can run or relax to recover its mental and physical balance or to vent its energy. Other important factors in this healing method are the means employed and the work team. First, the team must be made up of doctors, physiotherapists, psychologists, educators, professional educators and an operator who knows the animal. If it is free from a medical team, we won't refer to it as a pet therapy but it will only be considered a game activity with animals. Finally it must be remembered, that the Pet- Therapy should not be seen as a traditional cure, but as an alternative mediation method that in combination with other curative and educational methodologies, can achieve positive results during the treatment and the care.

Therefore, pet therapy is a co-therapy that combines a traditional therapy in progress. Ballarini in his book "Animal Friends of health, how to care with pet therapy" calls it a "gentle therapy". The main purpose of the pet-therapy is precisely to facilitate the medical and therapeutic approach of the various medical and rehabilitative figures, especially in cases in which the patient does not show spontaneous collaboration, in fact, the presence of an animal in many cases consolidates an emotional relationship with the patient, and through this relationship, it establishes both a communication channel between patient-animal-doctor and an urge to the active participation of the patient. Precisely because of the vastness of the scope of this methodology it was considered appropriate and necessary, standardize the lexicon at national and international level in order to clarify the specific role of the pet within various programs used about which we are going to discuss:

1) Animal-Assisted Activity (AAA) to indicate recreational and educational interventions that aim to improve the quality of life of the patients, it is important to emphasize that they are not really rehabilitation activities but they are only assistance interventions to support the rehabilitation activities from which the patient will benefit, a concrete example of this type of intervention is the "Patch Adams", best known as "clown- therapy" or "laughter- therapy". The assisted activities with the aid of animals are in general group activities and can be offered in a variety of environments by properly trained professionals, paraprofessionals and/or volunteers who have already completed a certain educational path type zoo and anthropological behaviorists. Since this type of intervention is extremely generalizable and

applicable to different types of users by age, issues, conditions and context, programs can be offered in a large number of facilities such as nursing homes and day centers for the elderly, children's hospitals (with recreational activities for children hospitalized at the pediatric emergency room, in centers withdrawals etc.), educational and rehabilitation centers socio day and/or residential, prisons, communities for children and so on.

2) Animal Assisted Education (AAE) to indicate educational interventions and recreational/leisure carried out with the help of animals. In these programs, the animal performs a double function it is at the same time a mediator between educator/teacher and user, a catalyst of attention and a behavioral model. These programs have specific objectives that fall within the educational and are proposed and implemented by educators/teachers in close collaboration with the conductors and with health professionals and animal welfare. This method refers to all those educational processes of the group, generally carried out in schools, involving the auxiliary use of pet and which have as their purpose the socialization of the child, the facilitation of communication and strengthening self-esteem and sense of responsibility. The peculiarity of the child-animal relationship allows, unlike the traditional educational methodologies, to integrate the educational sphere of learning with the emotional and relational. This is particularly important in the current school, in which the interest of educators and teachers is no longer purely informative but instructional and training too. The structures in which it is possible to propose programs AAE are such schools of all levels, youth centers, playgrounds, socio-educational centers, community centers for children and adolescents.

3) Animal-Assisted Therapies (AAT) are interventions aimed to rehabilitation of emotional and cognitive alterations caused by specific diseases or ailments emotional and / or psychological. They are carried out by professionals with expertise and with the help of animals selected according to specific mental attitudes and morphological character, and they have already followed precise paths of education and training supported by appropriately trained conductors. For each patient it is processed in advance an individual project of intervention that involves the choice of the animal based on the purpose to be achieved, and the collaboration of a multidisciplinary team composed of both reference operators as educators, psychologists, nurses, etc., under control and professional supervision of health and human welfare as doctors and therapists, as these programs are constantly evaluated and documented. The AAT, have the overall objective of encouraging the improvement or the maintenance of the psychic, cognitive and social functions.

4) Animal Assisted Psychomotor Therapy (AAPT) developed in the last two decades from the psychometrician and pet-therapist: Sparta Piccinno, co-founder and president of the Italian pet-therapy. This fourth category is specific to the psychomotor aspect, working more precisely on the area of movement for the recovery of cognitive domain, by retracing the patient properly the stages of that evolutionary path that for various reasons has been made in the name instead of deficiencies and/or malfunction. Its application was effective in psychiatric areas, both neurological and generically geriatric. The dog has the role of facilitator of this process, provides an incentive motivation that pushes the patient to deal with situations which could not experience. The child, playing with the dog, is stimulated by the animal and the therapist to develop from time to time where games are planned body movements aimed at the generation of cognitive effects.

Today, with the decline of the culture of the village and small communities, people find it increasingly difficult to cultivate personal relationships and identify emotionally with their own fellow. While the large cities isolate children keep playmates as television and videogames company. The dog, with its imperious need for affection and dependence, remains the most effective means to combat the dangerous "autistic tendencies" as the limitations of interests, the isolation, the phenomena of narcissistic withdrawal on himself etc., which the postmodern civilization insidiously aids.

2. Objective

The purpose of this report is to try to overcome the simplistic conception that "animals are good for man" and turn it into a concrete operational proposal, above all by understanding both how and how many facilities are available to follow this therapeutic program and making teachers and parents to taking concrete steps towards these new ways of learning and education.

3. Method

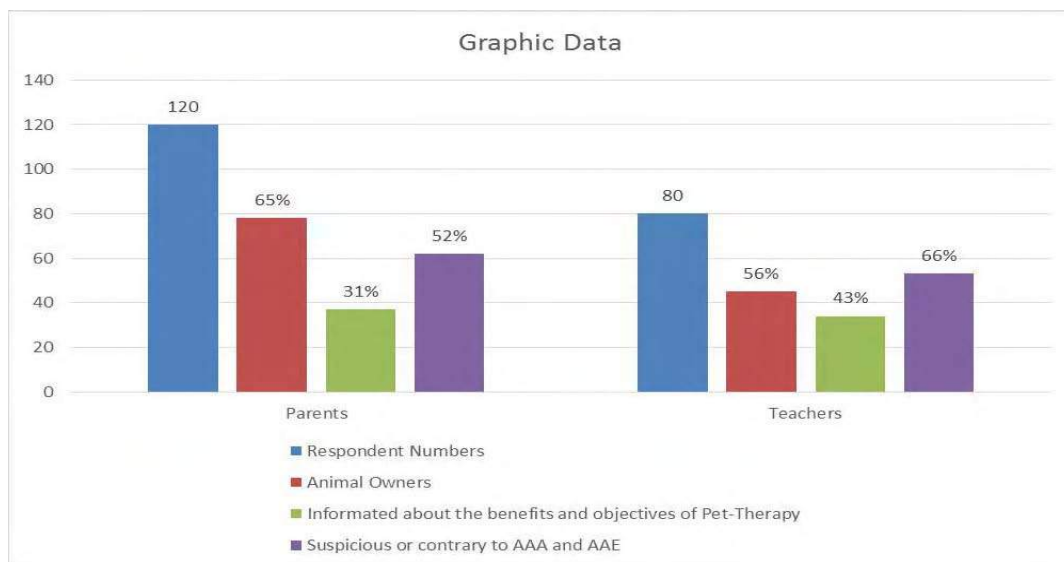
In order to understand whether this is well accepted in the educational programs in Salerno schools, there were made structured interviews with multiple choice questions to parents, teachers and children to understand the degree of information received in the field of AAE and their opinions about it and above all to understand the views of parents and teachers about the possible implementations of the

method. We also wanted to investigate on their will to propose educational or therapeutic assisted activities with animals in their schools and with their children and finally to understand how reliable they assessed this educational approach.

In order to achieve the above objectives, we went to the comprehensive schools of Salerno, both private and state, which in spite of their initial distrust; they decided to give confidence to our research by lodging in their facilities. After viewing and recording our request, we were allowed to proceed so materially to the administration of the questionnaires. We then subjected 200 people, including teachers and children's parents between 3 and 10 years, to a questionnaire of 12 multiple choice and three open-ended questions, in which they could answer anonymously and voluntarily, by basing on their life experiences, on information already in their possession on pet therapy, but mostly basing on their thinking about this type of intervention. We then collected and analyzed data with Excel, we have standardized answers giving positive value to the positive answers (yes) and negative value to negative answers (no). Finally, we converted the data into percentages to have a global idea of the results. We also decided to split the total results further dividing them into those that emerged from the teachers and those that emerged from the parents to have an even clearer idea on the search criteria.

In the end, we have created a chart for the answers which we considered most relevant.

4. Discussion



From research conducted on 120 parents and 80 teachers has showed that: 62% of people surveyed have or have had a pet, noting positive and beneficial effects on both the child and the family. They stated that children show greater responsibility towards themselves and towards others, cooperation, peace, sunshine and they are always ready to play on outdoor activities thanks to the company of their four-legged friend, more people have also stated that even in adults pet produces positive effects, the largest number of respondents claimed that, back home, the dog away the negative thoughts that are working and daily, often due to stress. The 3% considered that the companionship of a pet can have negative effects as a distraction in daily activities and it can cause deficiencies sanitation and to led to the onset of disease, but we want to emphasized that the latter also reported they have never owned a pet. Only 36% of respondents were aware of pet therapy and vaguely knew the benefits and objectives. An alarming fact is that 76% would not absolutely accept in the classroom a dog trained for this purpose during lessons while the other one would accept it with suspicion. A news more than comforting, however, is that, after explaining the benefits, showed the goals and having informed them that behind these actions there are professional teams, with routes of relevant studies, almost all confirmed that they have changed their minds and confirmed that they have including the beneficial effects of pet therapy, except the 1% who stated that he was his own idea to the disadvantage of this type of activity and he is absolutely opposite. Among teachers only 34% would accept without delay to bring these activities during their class hours, while the remaining 66%, 45% would accept it with suspicion, if supported by professionals in the field, 21% would not absolutely accept it. The last finding is that 87% of respondents said they want to deepen their knowledge on pet therapy and the benefits of this method is in relation to children and adults themselves, by stating that if the information channels expanded there would be high chances to make pet therapy a concrete operational proposal in schools. Unfortunately, the 3% would still

be opposed while 10% say with regret that, in their ward, it won't be able to change the negative views even expanding the information channels.

5. Conclusions

In conclusion we can say with regret that the research carried out, although with a small sample size, it was found that in the southern Italy, specifically in Salerno schools, there is a great misinformation or otherwise there is fragmentary and partial information, if not inaccurate and misleading on pet therapy, so as to bring to be suspicious or contrary to the educational and teaching proposal with the aid of animals although there are numerous studies that support these therapeutic, teaching and educational interventions and demonstrate the usefulness of pet-therapy in every area of intervention, showing concretely the benefits that can result in aid to traditional therapies and activities of all kinds and, in order to have such excellent results both in treatment, in teaching and education, and in the play-recreation. The affective education and socio-emotional promotes psychological well-being of the child, helping to create a positive self-image and to establish rewarding relationships with others. For this working on emotions in schools is extremely important to develop self-control, reduce aggression, prevent depression, experience more satisfying social relationships, achieve greater social acceptance and increase self-esteem individual. From an educational point of view the educational AAE can also be used in schools to increase the knowledge of the animal world, thus facilitating the environment and mediated through interaction with animals, children can build a loving relationship with them, experiencing attitudes of care.

From an educational point of view-the educational AAE can also be used in schools to increase the knowledge of the animal world, thus facilitating the environment and mediated through interaction with animals; children can build a loving relationship with them, experiencing attitudes of care and protection. These behaviors will help in promoting a sense of responsibility in that, take care of a pet postpone, who is dealing with it, a positive image of himself as a competent person and valid. In particular, these activities promote integration processes within the school environment, especially in classes that are home to people with disabilities, individuals being more vulnerable than in the group, in fact, in children with severe damage neuromotor and sensory interaction with animals provides a big help for their mental and physical wellbeing. To implement these interventions, however, we must learn and understand who or what programs are suitable to be made and it is especially important to remember, first that animals are never "instruments" of work, but "companions" of travel and as such they must be respected and understood. Learn to respect others for what they are, can be a huge help not only in work but also in life in general. The hope is that the Pet-therapy is no longer considered something abstract or an unusual experience, but it can come to be a valuable business tool in many different situations of discomfort, in everyday Italian school and not, but also and above all in the path of life of each of us.

References

- Defranceschi Marco, *Un cane diversamente abile: pet-therapy e progettazione pedagogica in contesti riabilitativi e terapeutici*, F. Angeli, 2010
- Edoardo Giusti, Salvatore La Fata, *Quando il mio terapeuta è un cane... Animal Assisted (Pet)-Therapy*, Roma, Sovera, 2004
- Elide Del Negro, *Pet therapy: un metodo naturale: un programma di riabilitazione e rieducazione psicoaffettiva*, Milano, F. Angeli, 1998
- Elide Del Negro, *Pet-therapy, una proposta di intervento per i disabili neuromotori e sensoriali*, FrancoAngeli, 2004
- Giovanni Ballarini, *Animali amici della salute: curarsi con la pet therapy*, Milano, Xenia, 1995
- Giovanni Ballarini, *Animali terapia dell'anima: le nuove vie dell'applicazione degli animali nella terapia umana (pet therapy)*, Brescia, Fondazione iniziative zooprofilattiche e zootecniche, 2000.
- Giuliana Proietti, Walter La Gatta, *La Pet-therapy*, Xenia, 2005
- Lorenzo Pergolini, Rino Reginella, *Educazione e riabilitazione con la pet-therapy*, Erickson, Milano, 2014
- Marzia Giacon, *Pet therapy: psicoterapia con l'aiuto di Amici del mondo animale*, Roma, Edizioni mediterranee, 1992
- Roberto Marchesini, Laura Corona, *Attività e terapie assistite dagli animali: l'approccio zooantropologico alla pet-therapy*, Bologna, Apeiron, 2007
- Sparta Piccinno, *Pet-Therapy Psicomotoria*, Editoriale Olimpia, 2010.

FROM SPORT EDUCATION TO INCLUSIVE TEACHING FOR THE IDENTIFICATION OF SEN

Laura Rio¹, Paola Damiani² & Filippo Gomez Paloma¹

¹*Department of Human, Philosophical and Education Science, University of Salerno (Italy)*

²*Department of Philosophical and Education Science, University of Turin (Italy)*

Abstract

The theme of special educational needs (SEN) and, broadly, the question of diversity, is a central value for “innovative inclusive schools”, following the neurodiversity concept (Amstrong, 2011).

International educational documents claimed the centrality of the development and life project of each person as the school's mission, to be achieved within the community context. ICF (International Classification of Functioning, Disability and Health, WHO, 2001) considered the totality and complexity of the functioning of the person, recognizing the role of contextual factors (personal and environmental), as well as organic and structural aspects.

Personal factors are not encoded in the ICF framework, even if they are very influential in the learning process. For this reason, we considered them as key elements on which to build our research model. This model reflected the Embodied Cognitive Science (Gomez Paloma, 2013; Caruana & Borghi, 2013), a paradigm which highlighted the significance of emotional, sensory and motoric dimensions in the individual, global development. Physical exercise improves brain structure and function (Chaddock et al, 2010); moreover, recent research (Ianes & Gomez Paloma, 2014) demonstrated that Sport Education activities provide an excellent assessment framework for the identification of SEN, because physical activity is an inclusive disciplinary area which allows students to express their personality, build relationships, express motor behaviours, etc.

The aim of this research is to involve schools, giving them scientific criteria for the identification of SEN, and enable them to experience models of inclusive education within an action research process. Through EDUFIBES, a software produced and validated as a tool for the detection of personal factors helpful in the identification of students with special educational needs, it has been tested strategies for inclusive practices and collected input and output monitoring data.

The data emerging by the software has been useful for the preparation of two types of courses - one for empowerment and the other for remediation - and for the preparation of a customized teaching plan, based on ICF, that considered the global dimension of the whole class, besides SEN student, and of their personal and contextual factors.

Keywords: *Inclusion, Physical Education, Embodied Cognition.*

1. Introduction

Analysing the nature of the methodological-strategic-educational processes at school, within a paradigmatic frame related to inclusion issues and special educational needs, is a very complex task, but crucial to the definition of an education for a subject capable of reflecting the profound essence of humanity and dignity principles.

The disability world in education is a difficult reality to deal with and too often it is flattened into a myriad of educational models and standardized operational proposals.

For a long time, in fact, there was the need of a special education, closer to the real needs of the students, and able to influence the learning processes.

In this perspective, the MIUR Directive of 27 December 2012 stated: "... It is important the contribution of the diagnostic ICF model (International Classification of Functioning, Disability and Health, WHO, 2001), which considers the whole person, in a bio-psycho-social perspective. Relying on the functions of the subject and on the analysis of the context, the ICF model allows to identify the Special Educational Needs (SEN) pupil. This normative dictation emphasized the need to develop "an individualized and customized program for students with special educational needs, also through the drafting of a Personalized Learning Plan, and also referred to all children in the class, which will serve as

a working tool, in progress, for teachers, and it will be a document for families with all the planned intervention strategies" (MIUR, 2012). The Directive is primarily aimed to protect those persons with special educational needs who, having no impairments in ICF "Body Functions and Structures" area, they do not have certification according to the law of disability, n. 104/1992, or specific learning disorders, n. 170/2010, but they have difficulties and/or problems in their own learning activities and school socialization.

Human functioning is described with three essential reading keys:

- the body with its functions and structures (being a body);
- intentional activities and social participation (having a body);
- a natural and social setting (the environment).

The child works well if he can positively weave his biological factors with the various forms of learning, provided by the experience, and by contact with human relationships and physical learning. Education helps this relation, in its many daily activities, providing stimuli, feedback, models, etc. and the child works if he integrates these messages with his own instance. When the various factors interact in a positive way, the child grows healthier and works well in terms of educational learning, otherwise his operation is difficult, hindered, disabled, sick, with special educational needs, etc. (Ianes D., 2013).

The relations between the corporeality and formation of individual social and learning identity, support a new holistic view of motor skills that cannot be reduced exclusively to the biological processes, but it should be considered an expression of intelligence, emotions and self-determination. In fact, the cognitive processes related to learning, in a dynamic exchange with the social behaviour and communication systems, can all be considered cognitive mechanisms that are based on motor skills.

From this perspective, the didactic setting that is built during Physical Education and Sport, is an excellent evaluation framework for the identification of SEN.

The class and its structural and relational constraints, often limits or even represses the functional, relational and social demonstrations that students want or could express and communicate. The setting of Physical Education, however, has always been recognized as a disciplinary area that allows students to express their personality, build dynamics of relationships, express motor behaviour (Raiola G., Tafuri D., Gomez Paloma F., 2014); all characteristics that guide teachers to perceive, with greater validity, the objectivity of the real presence of a student with special educational needs.

The National Guidelines (2012) have just confirmed this vision of Physical Education, which "promotes self-awareness, potentials, in the constant relationship with the environment, other people, objects, [...], promotes cognitive social, cultural and emotional experiences, [...], promotes the value and respect of rules and ethical values that are the foundation of civil society, [...]. Participating in physical activities and sports means sharing experiences with other people in the group and it also promotes the inclusion of children with various forms of diversity and enhancing the value of cooperation, [...]. Through physical activity the student is facilitated in the expression of communication and hardships of various kinds that cannot always communicate with verbal language" (MIUR, 2012). From this perspective, the Personal Factors, although not encoded in the ICF framework as the other areas (Personal Activities, Social Participation, etc.), were considered key elements on which to build a research model, because according to the latest neuroscience research (Caruana & Borghi, 2013; Damasio, 2009; Gomez Paloma, 2013), they are particularly influencing into the learning process.

2. Objective

The aim of this research is to involve schools, giving them scientific criteria for the identification of SEN, and enable them to experience models of inclusive education within an action research process.

3. Methods

Through EDUFIBES, a software produced and validated as a tool for the detection of personal factors helpful in the identification of students with special educational needs, it has been tested strategies for inclusive practices and collected input and output monitoring data.

Personal Factors were divided into 24 indicators and three subsections:

1. Self-Area,
2. Emotionality and Control,
3. Motivation and Problem Behaviours.

They detected, thanks to the teaching of Physical Education and Sports, behaviours, situations, attitudes and postures of the students and, in order to measure the frequency of the behaviour, it is used an assessment scale ranged from 0 to 4:

- 0 when the behaviour never occurs,

- 1 when the behaviour rarely occurs (from 1% to 25% of the time),
- 2 when the behaviour sometimes occurs (from 26% to 50% of the time),
- 3 when the behaviour often occurs (from 51% to 75% of the time),
- 4 when the behaviour always occurs (from 76% to 100% of the time).

Starting from the enhancement and improvement of these factors, the teaching has to be rethought in a global empowering view, considering the personal factors as a central dimensions of the teaching/learning process that have to be integrated and enhanced within the didactic planning.

Teaching strategies reflect the inclusive features and they are consistent with the three areas of Personal Factors previously described. They are:

- Modification of the setting in the classroom: structural changes regarding the disposition of school furniture (desks, chair, blackboard), time, space and teaching materials;
 - Cooperative learning: organization of the group in order to facilitate the acquisition of cognitive and social skills through collaboration and positive interdependence.
 - Laboratory: organization of the setting and teaching methods to stimulate an active work on a specific theme or topic, arousing curiosity and motivation to knowledge.
 - Metacognition: development and use of the ability to reflect on the cognitive processes and on the way of learning; awareness of one's own strengths and weaknesses.
 - Emotional-relational education: emotional, social and relational skills development in terms of knowledge, awareness and ability to manage their own and others' emotions.
 - Narrative and autobiographical strategies: story of his own experience of learning and participation in the class; enhancement and clarification of the relationship between a topic of study and the personal narratives of the students.
 - Nonverbal expressive strategies: knowledge and use of codes and iconic, musical, gestural tools, to express feelings, emotions, communicate informations.
- In particular, dividing them in three subsections we find:

- a) Self-Area: narrative and expressive strategies, verbal and nonverbal, metacognitive strategies; emotional-relational education; collaborative strategies; technologies.
- b) Emotionality and Control: emotional-relational education; emotional and expressive strategies, verbal and nonverbal; metacognitive strategies; collaborative strategies; change the setting-lab.
- c) Motivation and Problem Behaviours: metacognitive strategies; collaborative strategies; change the setting-lab; technologies.

The use of these strategies is advantageous to work on the development of the personal factors of the students and to improve the disciplinary learning through education for skills, which are both disciplinary and transversal. Teaching for skills refers to personal factors; there is a virtuous circularity between the development of the personal factors and the development of skills (National Guidelines, 2012).

4. Discussion

The data emerging by the software has been useful for the preparation of two types of courses - one for remediation and the other for empowerment - and for the preparation of a customized teaching plan, based on ICF, that considered the global dimension of the whole class, besides SEN student, and of their personal and contextual factors.

The course for remediation is for those individual students or groups of students for which certain personal factors represent a critical element (1-4), which also needs an intervention of customization within the more general methodological intervention in the class. The course for empowerment, however, is for individual students or groups of students for which certain personal factors represent an element of particular value (0), which also needs a redevelopment project within the more general methodological intervention in the class.

A Personalized Learning Plan, consistent with the ICF model, should contain the most important informations related to personal factors (with strengths and weaknesses), student's characteristics emerged from the diagnosis and the identification of his situation as a special educational need (elements of the diagnosis or in the report of the Class Council), the characteristics of the pupil with SEN emerged from empirical observation in the classroom context, features detected by the personal description of the pupil with SEN. This information should be used to fill a Personalized Learning Plan that is useful to change the education in a global inclusive sense, that it will help the whole class, in addition to the student with SEN.

Briefly, the Personalized Learning Plan, in addition to the traditional elements, must include: learning objectives for skills, teaching strategies, facilitation strategies and changes for the class and for the pupil with SEN, observations and considerations for the redesign.

5. Conclusions

The results allow to formulate some assumptions and interpretive considerations, based on evidences, level of effectiveness (or not effectiveness) and the actual inclusive value (or less) of the strategies adopted by teachers.

The reflection on teaching practices of teachers, conducted through participatory action research methodology, allows a fruitful confrontation between researchers and teachers, reducing the gap between the academic and the education world, through the identification of "real problems" and the "probation" of models and theories of pedagogical and didactic literature.

References

- Canevaro, A. & Ianes, D. (2001). Buone prassi di integrazione scolastica. Trento: Erickson
- Caruana, F. & Borghi, A.M. (2013). Embodied Cognition: una nuova psicologia. *Giornale Italiano di Psicologia*, DOI: 10.1421/73973
- C. M. n. 8 del 6 marzo 2013, Strumenti di intervento per gli alunni con bisogni educativi speciali (BES)
- D.M. 27 dicembre 2012, Strumenti d'intervento per alunni con bisogni educativi speciali e organizzazione territoriale per l'inclusione scolastica
- Damasio, A. (2009). Emozione e coscienza. Milano: Adelphi
- Gallese, V. (2006). Corpo vivo, simulazione incarnata e intersoggettività in Neurofenomenologia. Le scienze della mente e le sfide dell'esperienza cosciente a cura di Cappuccio M., Milano: Mondadori
- Gomez Paloma, F. (2009). Corporeità, didattica e apprendimento. Le nuove neuroscienze dell'educazione. Salerno: Edisud
- Gomez Paloma, F. (2013). Embodied Cognitive Science. Atti incarnati della didattica. Roma: Edizioni Nuova Cultura
- Gomez Paloma, F. (2014). Scuola in movimento. La didattica tra Scienza e Coscienza. Roma: Edizioni Nuova Cultura
- Indicazioni Nazionali per la Scuola Secondaria di Secondo Grado, 2010
- Indicazioni Nazionali per il curriculum della Scuola dell'Infanzia e del Primo Ciclo d'Istruzione, 2012
- Ianes, D. & Cramerotti, S. (2002). Comportamenti problema e alleanze psicoeducative, Trento: Erickson
- Ianes, D. (2004). La diagnosi funzionale secondo l'ICF. Trento: Erickson
- Ianes, D. & Cramerotti, S. (2005). Il Piano educativo individualizzato - Progetto di vita (Guida 2005-2007), Trento: Erickson
- Ianes, D. (2005). Bisogni Educativi Speciali e inclusione. Trento: Erickson
- Ianes, D. (2005). Bisogni Educativi Speciali e inclusion – Software gestionale (CD-ROM). Trento: Erickson
- Ianes, D. & Macchia, V. (2008). La didattica per i Bisogni Educativi Speciali. Strategie e buone prassi di sostegno inclusive. Trento: Erickson
- Ianes, D. & Cramerotti, S. (2011). Usare l'ICF nella scuola. Trento: Erickson
- Ianes, D. & Cramerotti, S. (2013). Alunni con BES Bisogni Educativi Speciali. Trento: Erickson
- LeDoux, J. (2002). Il sé sinaptico. Milano: Raffaello Cortina Editore
- LeDoux, J. (2003). Il cervello emotivo. Alle origini delle emozioni. Baldini Castaldi Dalai
- Macchia, V. (2006). I Bisogni Educativi Speciali e le risorse per una didattica inclusiva. *Difficoltà di apprendimento*, vol. 11, n. 54, Trento: Erickson
- O.M.S. - Organizzazione Mondiale della Sanità (2002). ICF, Classificazione Internazionale del Funzionamento, della Disabilità e della Salute. Trento: Erickson
- Pope, A., McHale, S., Craighead, E. (2008). Migliorare l'autostima. Trento: Erickson
- Raiola G., Tafuri D., Gomez Paloma F. 2014. Physical activity and sport skills and its relation to mind theory on motor control, *Sport Science* vol 7 1 52-56.
- Salovey, P. & Mayer, J. D. (1990). Emotional intelligence. *Imagination, Cognition, and Personality*, 9, 185-211. A first formal theory of emotional intelligence, and a review of then-existing literature that might pertain to it.
- Schlotter, M., Schwerdt, G., Woessmann, L. (2011), Econometric methods for causal evaluation of education policies and practices: a non-technical guide, *Education Economics*, vol. 19, n.2
- Siegel, D.J. (2009), Mindfulness e cervello. Milano: Raffaello Cortina Editore

HYBRIDIZING L2 LEARNING: INSIGHTS FROM AN INTACT CLASS EXPERIENCE

Nádia Silveira¹ & Kyria Rebeca Finardi²

¹Master in Applied Linguistics, Navy Academy Teacher, Enseda do Inhoá, Prainha, 20101-606, Vila Velha, ES (Brazil)

²PhD in English and Applied Linguistics, Professor of Department of Languages, Education and Culture, Federal University of Espírito Santo, Ave. Fernando Ferrari, 514, 29075-910, Vitória, ES (Brazil)

Abstract

Based on the assumption that both knowledge of English and digital literacy are important tools to access information online (Finardi, Prebianca, & Momm, 2013), the present study investigated the impact of a hybrid approach to English as a foreign language teaching in an intact class in Brazil. Hybrid approaches have been described as the combination of face-to-face classes with online instruction, which may be implemented at the activity, course, program or institutional level (Graham, 2005), and in this study it was operationalized as the combination of face-to-face classes with computer-mediated activities performed in an online environment. Twenty male participants were recruited in an intact class in the Brazilian Navy Academy Boarding School to participate in the study. Data includes class observation, tests, questionnaires and interviews, analyzed qualitatively to evaluate the impact of online tasks in L2 learning, as well as in the development of students' autonomy and digital literacy. Three tasks adapted from Finardi and Porcino (2013) using different sites on the internet were administered, followed by a questionnaire after each task. Overall results of the qualitative analysis of students' perceptions of the tasks performed in the online environment revealed that the L2 hybrid approach used may contribute to the development of students' autonomy, motivation, digital literacy and L2 development through extended contact with and in the target language.

Keywords: L2 teaching, Hybrid approach, L2 Tasks, Internet tools.

1. Introduction

The aim of the present study is to examine the possibility of developing linguistic competence and learning autonomy in an additional language (henceforth L2) by means of online tasks performed in a hybrid approach environment which combined face-to-face classes and online activities carried out in the lab. The main motivation for the study was to reflect about teaching methodologies which combined internet use in an autonomous way with classroom activities so as to expand learners' contact with the target language while also solving some problems of traditional face-to-face teaching approaches, such as temporal and geographical limitations, in a model of expanded classroom (Hardagh, 2009).

Internet has been claimed to expand learners' access to information (Finardi, Prebianca, & Momm, 2013) and to have changed the way we use, teach and learn additional languages (Finardi & Porcino, 2014) but the extent to which it has actually been used to access relevant L2 information is still unknown. What is known, in the case of Brazil where the study was conducted, is that internet is ubiquitous and very used in that context. Brazil was labeled by the Wall Street Journal as the capital of social media and as the future of social networks by the Forbes magazine in 2013. With a population of about 200 million people, in 2013 it reached over 80 million web users, 78% of whom access some kind of social network on a daily basis. Yet, in a report carried out by Brazilian newspaper Jornal da Globo¹ we see that seven out of ten Brazilians did not read a single book in 2014. What these numbers show is that Brazilians use the internet but mainly for social networks, not to access relevant information and contents in L2, as suggested by Finardi, Prebianca and Momm (2013). Based on this evidence, the present study had a two-fold aim: 1) to reflect on L2 teaching approaches that could help Brazilians to learn how

¹Available at <http://g1.globo.com/jornal-da-globo/noticia/2015/04/70-dos-brasileiros-nao-leram-em-2014-diz-pesquisa-da-feccomercio-rj.html>, accessed on May 1st, 2015.

to access relevant L2 information online and 2) help Brazilian learners to become more autonomous in the search for L2 contents online thus fostering L2 development through an increase contact with the target language. A secondary aim of the study was to develop learners' digital literacy – conceptualized as the ability to interpret and manipulate information online - through their experience with internet tools.

In order to achieve these goals, three tasks (Ellis, 2003) adapted from Finardi and Porcino (2013) were tailored to be used by L2 students outside the class, in a hybrid approach to L2 teaching where students would carry out L2 tasks in a lab with the use of internet tools in addition to having L2 classes in the Navy School where the study was made. In what follows, the theoretical underpinnings of the study with the concepts of hybrid approaches, task based language teaching and multiliteracies will be reviewed before describing the methodology used to achieve these goals.

2. Hybrid Approach

The term hybrid approach (Graham, 2005) is usually associated with traditional face-to-face classes with instruction in a virtual learning environment. However, the term has evolved to define wider teaching dimensions, such as the combination of face-to-face classes with online classes, structured learning, that is, previously planned classes, and non-structured classes – classes planned according to the interest and need of learners, following the pace of each individual (Wilson, 2011).

Graham (2005) documented four levels of hybrid approaches, namely, the activity level, the course level, the program level and the institutional level. In the activity level, face-to-face and computer-mediated elements occur in the same activity. In the course level, face-to-face activities and online activities occur in the same course. In the program level, face-to-face courses and online courses occur in the same program and in the institutional level, commitment and effort are made so as to best benefit learners with the combination of face-to-face teaching methods and virtual teaching methods. According to Graham (2005) and Finardi (2012), this combination of face-to-face instruction and online instruction is the best definition for hybrid approach, as it is the combination of the best of both worlds, especially for the individuals' age group addressed in this research, which is why we used the same definition here.

3. Task-based Approach

Ellis (2003) defines a pedagogical task as a plan that forces learners to process language in a way that resembles the use of language outside the class, in the real world. According to Larsen-Freeman, the Task-Based Approach (TBA) aims at providing learners with a natural context for L2 learning. In this approach, learners have several opportunities to develop communicative competence, once they need to interact with others in similar situations found outside the class while they work to accomplish a task. During these interactions, the focus is on meaning and not on form, and learners receive L2 input that will help them perceive gaps in their L2 language system.

4. Methodology

The methodology used in the study was that of action research (Dornyei, 2007) and aimed at reflecting about the potential of internet tools to develop learners' autonomy, L2 skills and digital literacy. Twenty male participants aged between 18 and 22 years old were recruited from an intact English as a foreign language class in the Brazilian Navy Boarding School (Escola de Aprendizes-Marinheiros do Espírito Santo) and performed three tasks with the use of online tools in a hybrid environment, out of their regular English classes. Participants had face-to-face classes as part of the school curriculum and performed three pedagogical tasks with internet tools after class, without the teacher's presence and interference, in a computer lab.

The three pedagogical tasks were adapted from Finardi and Porcino (2013). The first task (Table 1) involved the reading of a journalistic text, chosen by each participant in the site www.newsmapi.jp. Participants should read the text in English with the help of a journalistic text in Portuguese, also chosen by each participant and which contained the same theme as the English one. The online tool www.translate.google.com was suggested for the translation of words and parts of the reading. The second task (Table 2) presented a more interactive focus once it had the objective of stimulating participants to qualify and select products found online for shopping. Participants had to access the site www.amazon.com with the aim of purchasing three presents for friends or family, using the online dictionary www.pt.bab.la to check for unknown words. The third task (Table 3) consisted of using a social relationship site, the www.hipenpal.com to make friends (pen pals) with a foreigner. The task

required participants to read the texts presented on the site home page using the suggested translation tool www.linguee.com as a support for translation. Participants had to write a short paragraph in English (L2) about them to be posted in the site to contact a possible match for the pen pal.

It is important to emphasize that the participants had to follow the tasks instructions, using the suggested translation tools and online dictionaries, but they had the freedom to use other tools in case they wished to. A time limit was not set so that the participants could do the tasks in their own time, giving more emphasis to accuracy when performing the tasks (Ellis, 2006). The three tasks were performed throughout the academic semester, in varied days, according to the participants' availability.

5. Data collection

Three questionnaires and interviews were administered after each pedagogical task so as to gather data regarding participants' perceptions on the tasks and the hybrid approach used. A researcher-teacher's diary was also used to record observations made during participants' performance in class. The data presented comprises questionnaires and interviews carried out with participants after each task execution and the researcher-teacher's diary.

6. Results and discussion

The aim of Task 1 was to check participants' skill in interpreting a journalistic text. The task authenticity was highlighted by means of allowing participants to choose the text they thought that would strike their interest. The task was characterized as unfocused (Ellis, 2003), since it did not demand any specific grammatical structure from the participants. Analyzing the first part of Task 1 performed by participant A, we observe that he was able to use the association strategies for the task execution. Despite the difficulties in finding a similar piece of news, since the piece of news chosen by him was local and not international, participant A was able to complete the task, as we can see in the Table 1 below with the transcription of his performance.

Table 1. Excerpt of participant A's first task

Instructions for the Task 1	Participant A's answers
1) On this page, select and read a piece of news that you find interesting; copy and paste it here.	Gunman arrested in Dallas after standoff with police
2) Go to the news section about Brazil and try to find a similar piece of news to the one you have just read. If you find it, read, copy and paste the news headline here.	Man confesses having raped and killed 9 year old girl, says police
3) After you read the piece of news again, answer the following question in Portuguese. What's the news about?	A man in his forties, hidden in an apartment downtown Dallas was arrested
4) Did you find a similar piece of news on the Brazilian page? Did the piece of news helped you understand the selected one in English?	Yes. It kind of helped me because it's about a man who was arrested too, but for another reason, for having raped and killed a 9 year old girl.

Table 1 shows that Participant A was able to perform the task by using the strategy of cognate words association and translation with the use of the Google Translator, the tool suggested for this task. It is possible that Participant A associated the word 'police' with 'polícia' (in Portuguese), and translated the word 'arrested' so as to find a similar piece of news in Brazil.

The following excerpt offers an example of the stimulus that the online environment offered participants, according to their report in the questionnaires and recorded interviews. The aim of Task 2 was to encourage participants to use adjectives to describe products to be purchased online and also to learn about adjective order. The task was considered focused (Ellis, 2003), as it had the purpose to induce participants to process a specific grammatical form.

Table 2. Excerpt of participant B in Task 2

Write the price and two characteristics of the selected products, in Portuguese and English			
Product	Price	Characteristics in English	Characteristics in Portuguese
Nokia Lumia 521 (T-Mobile) (my mother)	R\$69,99	Dual Core (1GHz) Processor Listen to your favorite songs with Nokia Music	Possui dois processadores Ouvir suas músicas favoritas no Nokia música
Nintendo 3DS XL – Blue/Black (my brother)	R\$180,99	Supported Flash Memory Cards: Secure Digital (SD). Graphic Quality :240 p	Suporta cartões memória: Seguro Digital (SD). Qualidade de Gráfico: 240p
Reef Men's Leather Smoothy Sandal (my father)	R\$57,00	Leather Rubber sole	Couro Sola de borracha

The excerpt illustrates Participant B's interest in completing the online task whose purpose was to choose presents online to give to important people for him. Participant B described the main characteristics of each product he chose, the cell phone for his mother, the Nintendo game for his brother and sandals for his father. Participant B performed the task completely, mentioning all the necessary characteristics to justify his choice for the product. The task develops not only the L2, but also motivates participants to develop their autonomy, by means of providing an authentic context and online tools to help him use the L2.

Although the internet tool suggested for the third task, the *linguee.com* was not enjoyed by most participants, they were able to perform the task as can be seen in the excerpt of Participant C below. In the third task, participants had to choose a pen pal in the designed site for the task and justify their choice. In this excerpt, the participant performs a previous step to choose his pen pal.

Table 3. Excerpt of participant C's in Task 3

Using the site <i>linguee.com</i> , select two parts of each pen pal's text (maximum of five words to make the translation easier) that you did not understand, and try to find a better translation	
PARTS IN ENGLISH	TRANSLATION (PORTUGUESE)
I'm not very good at speaking English	Eu não sou muito bom em falar inglês
I need to practice more	Preciso praticar mais

According to participant C's report, he did not like the site *linguee.com*. As reported by all the participants, the Google Translator tool was the most used internet tool by them. The analysis of the data suggests that the use of internet resources promotes not only digital literacy, but also autonomy in the case of L2 access since learners would be able to read L2 contents of their choice and in their own time with the help of internet translation tools used in this study.

According to the instructions of the third task, participants had to write a paragraph to send to a virtual friend in the future. The analysis of their paragraphs shows that they were worried about the originality of their texts and used the translation tools efficiently to carry out this task as can be seen in the following excerpts: (<participant C> *I also really want to learn to speak English.*; < participant D> *I currently live in the city of Vila Velha. The reason for this allocation is due to my military career*; < participant E> *I have many curiosities about foreign languages. I would like to make friends with a pen pal to learn more about...*; <participant F> *...wish to meet new people.*). In this sense, one can perceive the positive impact of tasks with online tools on the participants' performance, in lexical terms (< participant D> *currently*; *due*; *curiosities*; < participant E> *foreign*, *make friends*), grammatical terms (< participant G> *I'm in the Navy*; < participant H> *I would like to make...I'm curious about...*; < participant E> *I have many curiosities...*), L2 discursive terms (< participant H> *...make new friends.*; < participant D> *...is due to my military career*), and also in the development of digital literacy since participants used the internet tools well.

7. Conclusion

The analysis of data in the study reported here showed that the use of pedagogical tasks with online tools was important to develop learners' autonomy, L2 skills and digital literacy. The analysis of participants' reports suggests that hybrid approaches have a positive impact on learners' autonomy and L2 development. In the case of Brazil, where the study was conducted, it is important to bear in mind that English has the status of an optional foreign language in basic education (Finardi, 2014). The inclusion of one modern foreign language after 5th grade in the curriculum is mandatory but the choice of which language to teach is made by each school community. Thus, the teaching of English as a foreign language in Brazil is optional. Given the status of English in the globalized world (for example Graddol, 2006; Finardi, Prebianca, & Momm, 2013), on the one hand, and its status in Brazil, on the other, it is important to think about internet tools, especially in the form of internet translation tools so as to enable Brazilians to access information in English online in an autonomous way. The use of internet translation tools can help to minimize negative effects (for example Porcino & Finardi, 2014) associated with the lack of a curricular obligation to learn English as a foreign language in Brazil. Moreover, given the fact that most Brazilians are online but use the internet mainly to access social networks in Portuguese, perhaps the use of internet translation tools can help Brazilians to actually access relevant contents and information online in English, thus using the internet not only for entertainment but also for education and to build social capital (Warschauer, 2003).

References

- Dias, R. (2012). WebQuests: tecnologias, multiletramentos e a formação do professor de inglês para a era do ciberespaço. *Revista Brasileira de Linguística Aplicada*, v. 12, p. 861-882.
- Dörnyei, Z. (2007). *Research methods in applied linguistics*. Oxford: Oxford University Press.
- Ellis, R. (2003). *Task-based language learning and teaching*. Oxford: Oxford University Press.
- _____. (2006). The Methodology of Task-Based Teaching. *The Asian EFL Journal Quarterly*. v.8, issue 3, p.19-45.
- Finardi, K.R. (2012). Technology and L2 learning: Hybridizing the curriculum. In M.S. Beck, R. Silveira, S.B. Funck, R.P. Xavier (Eds.), *Language and Literature in the Age of Technology*, v. 1 (pp. 1-8). Florianópolis, SC: Universidade Federal de Santa Catarina.
- Finardi, K.R. (2014). The slaughter of Kachru's five sacred cows in Brazil: Affordances of the use of English as an international language. *Studies in English Language Teaching*, v. 2, pp. 401-411.
- Finardi, K.R., & Porcino, M.C. (2014). Tecnologia e metodologia no ensino de inglês: Impactos da globalização e da internacionalização. *Ilha do Desterro*, v. 66, pp. 239-284.
- Finardi, K.R., & Porcino, M.C. (2013). Internet tools in the design for a task cycle for L2 teaching. *Revistas Contextos Linguísticos*, Universidade Federal do Espírito Santo. v. 7, p. 273-291.
- Finardi, K.R., Prebianca, G., & Momm, C.F. (2013) Tecnologia na educação: o caso da internet e do inglês como linguagem de inclusão. *Revista Cadernos do IL*, v. 46, p. 193-208.
- Graham, C.R. (2005). Blended learning systems: definition, current trends, future directions. In C.J. Bonk, C.R. Graham, C.R. (Eds.), *Handbook of blended learning: global perspectives, local designs* (pp. 3-21). San Francisco, CA: Pfeiffer Publishing.
- Hardagh, C.C. (2009). *Redes sociais virtuais: Uma proposta de Escola Expandida*. (Doctoral dissertation, Programa de Pós-Graduação em Educação/ Currículo da Pontifícia Universidade Católica de São Paulo, São Paulo, Brazil). Retrieved from www.dominiopublico.gov.br/pesquisa/DetalheObraForm.do?select
- Larsen-Freeman, D. (2000). *Techniques and principles in language teaching*. Second Edition. Oxford: Oxford University Press.
- Porcino, M.C., & Finardi, K.R. (2014). Globalization and internationalization in ELT: Methodology, technology and language policy at a crossword in Brazil. In International Conference of Education, Research and Innovation, Sevilha. ICERI2014 Proceedings. *Madrid: IATED, 2014*, v.1, pp. 1-11.
- Warschauer, M. (2003) Social capital and access. *Universal Access in the Information Society*, 2.

THE MEASUREMENT INVARIANCE OF JOB DIAGNOSTIC SURVEY (JDS) ACROSS THREE UNIVERSITY STUDENT GROUPS TITLE

Mónica Martínez-Gómez¹, Juan A. Marin-García² & Martha Giraldo O'Meara³

¹*Departamento de Estadística, Investigación Operativa Aplicadas y Calidad, Univeridad Politécnica de Valencia (España)*

²*Departamento de Organización de Empresas, Universidad Politécnica de Valencia (España)*

³*Departamento de Personalidad, Evaluación y Tratamientos Psicológicos, Facultad de Psicología Universidad de Valencia (España)*

Abstract

Equivalence of measurement across different samples is a prerequisite for the generalization of an instrument. This study addresses the equivalence of the adapted version of the Job Diagnosis Survey (JDS) as a measurement tool and as a quality indicator of the teaching methodologies at a Spanish public university in three different contexts according to the degree and academic year. The study compared data collected from three degrees programmes, using a validated model that analyses the relationship between the features of teaching methodology with university students' motivation and satisfaction. A confirmatory factor analysis was carried out using a multigroup structural equation models, using the program EQS 6.1 to test the invariance. The assessment of invariance included the levels of configural, metric, scalar, covariance and latent variables invariance. Several goodness-of-fit measures were assessed. The results show that measurements are equivalent at the configural, metric, covariance and latent factors invariance. Although the hypotheses of scalar invariance is rejected, results suggest that JDS is partial strict invariant (equality of factor patterns, loadings and intercepts across time for all items and equality of item uniqueness) and has satisfactory psychometric properties on all samples. So we can establish, with caution, that the factor structure of the proposed model is equivalent in all groups.

Keywords: *Measurement equivalence, student's satisfaction and motivation, job diagnosis survey, multigroup confirmatory analysis, higher education, invariance.*

1. Introduction

Student satisfaction is a concept that has become more prevalent in higher education, since it is related to motivation, and to learning outcomes (Richardson 2005). In the last decades, it has been an increased interest about how to enlarge the level of participation of the students in the process of learning. For that purpose, is necessary to change traditional teaching towards a more active educational methodology where the characteristics of the context of student learning are taken into account. Due to the relationship between student satisfaction and teaching methodologies, many universities have incorporated some instruments to measure student satisfaction. However, little attention has been given to the structure and psychometric properties of this student satisfaction surveys. Only few studies have validated students satisfaction surveys and none have evaluated the comparability of the questionnaire across other cultures, languages or universities.

The main purpose of this study is to apply a multigroup confirmatory analysis to examine the measurement invariance (MI) of the Job Diagnostic Survey (JDS) adapted to teaching, which incorporates items about teaching methodology and items about student's motivation and satisfaction. We use data collected on different degrees and academic years. The results provide researches a feasibility study about how affect the new active methodologies on the satisfaction and motivation of the students and if we can integrate data surveys collected in different contexts.

2. Theoretical Framework

There are many and varied instruments to measure student satisfaction. Several studies have investigated the factors related to student motivation and the influence in their satisfaction (Adler et al.

2001; Ames 1992; Paris and Turner 1994; Ünal and Inan 2010). Over the last few years, reflections on the analogy between the business and academic worlds have appeared (i.e. Adler et al. 2001; Armstrong 2003; Cotton et al. 2002; Martínez-Gómez and Marín-García 2009; O'Neil and Hopkins 2002), especially in business management and engineering.

In the analogy between the business and academic worlds, we consider the teacher as a leader, managing a group of people (French, 2006) and we can consider our subjects as employees. The job designing is related to the teaching methodology and we can use tools that are useful in business management to measure students motivation and satisfaction.

3. Methodology

3.1. Sample

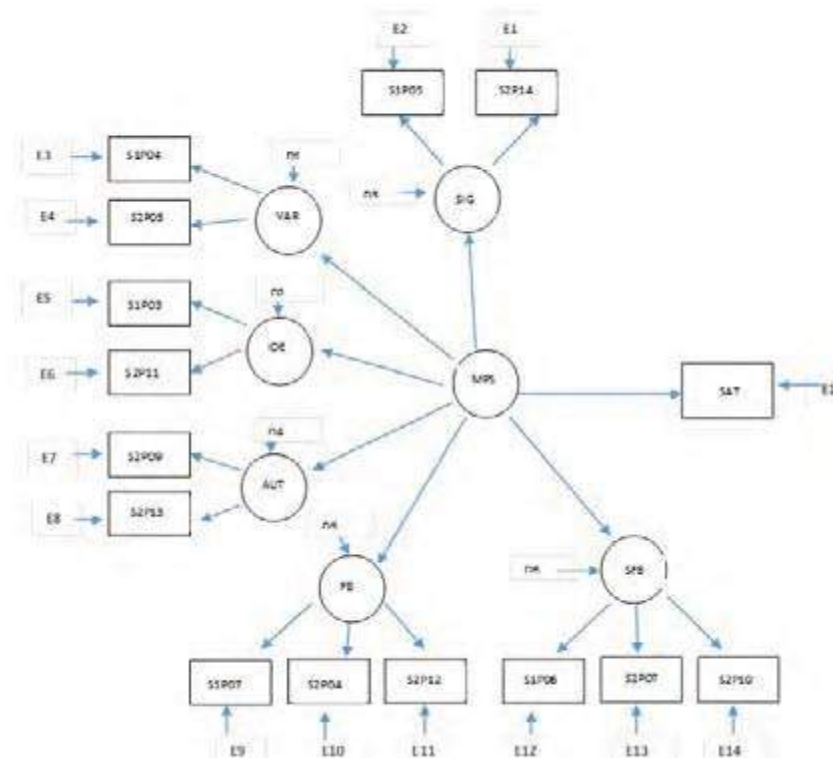
The total sample was constituted by 535 student of a Spanish public university. The first group was from Faculty of Business Administration and Management (FBAM) from academic year 2008-2009 (N=205). The second group, was also from Faculty of Business Administration and Management but from the academic year 2009-2010 (N=189). Finally, the third group was from Faculty of Industrial Engineering (FIE) from academic year 2007-2008 (N=141). Date of this sample were from different subjects and different courses. Questionnaires were completed as well in paper as web surveys. In a prior studied we established MI between both modes of administering the questionnaire, so we can used them jointly.

3.2. Instrument

We selected the validated scale of the Job Diagnostic Survey (JDS) following the adaption to university teaching (Authors 2013b) to examine MI across students of different degrees and academic years. The JDS (Hackman and Oldham 1975) is one of the main tools to evaluate how stimulating a job position is (Fried 1991; Griffin 1991; De Treville and Antonakis 2006). Its adapted version is a tool to diagnose teaching methodologies in university and includes a satisfaction single-item scale, the Motivating Potential Score (MPS) and job characteristics scales (Figure 1).

Figure 1. Model for the second-order factor model of teaching adapted version of JDS.

Source: Author's own



Note: Items or observable variable were reverse coded are denoted with SiPi. Items with acronym in parentheses: "To what extent does your job involve doing a "whole "and identifiable piece of work? That is, are the subject tasks a complete piece of work that has an obvious beginning and end? (S1P03); "What extent does the job require you to do many different things at work, using a variety of your skills and talents?" (S1P04); "In general, how significant or important is the subject? That is, are the contents of the

subject likely to significantly be useful for your future professional work?" (S1P05); "To what extent do professors or classmates let you know how well you are doing on your job?" (S1P06); "To what extent does doing tasks of the subject provide you with information about your work performance? That is, does the actual work itself provide clues about how well you are doing-aside from any "feedback" classmates or professors may provide?" (S1P07); Just doing the work required by the job of the subject provides many chances for me to figure out how well I am doing" (S2P04); "The job of the subject is quite simple and repetitive" (S2P05); "The professor and classmates on this subject almost never give me any feedback about how well I am doing my work" (S2P07); "As student of this subject, the job denies me any chance to use my personal initiative or judgment in carrying out the work" (S2P09); "Professors often let me know how well they think I am performing the job" (S2P10); "The job provides me the chance to completely finish the pieces of work I begin" (S2P11); "The job itself provides very few clues about whether or not I am performing we" (S2P12); "The job gives me considerable opportunity for independence and freedom in how I do the work" (S2P13); "The job of the subject itself is not very significant or useful in the broader scheme of my training as future professional" (S2P14).

E_i: Error term of each item.

D_j: Error term of each factor;

Latent factor with acronym in parentheses. "significance" (SIG); "variety" (VAR)=; IDE=identity; AUT= autonomy; FB= feedback from the job itself; SFB= feedback from agents; SAT= Satisfaction.

We fixed to one the initial saturation coefficients corresponding to a single variable for each of the factors.

Satisfaction with the students' workplace is measured by a single item (Overall, I am very satisfied with the course), with 7 levels of response, where higher values indicate greater satisfaction with the course. The job characteristics are measured by six scales assessing the variety, identity, significance, autonomy, feedback from the job itself and feedback from agents. The scales contain 14 items measured in a seven-points Likert scale. The response scale is presented in two ways: one, measured with three items with anchorage phrases in a graphic scale (items of Section 1, S1). The second one, a phrase that they have to answer according to the level of agreement or disagreement (items of section 2, S2). The sum of the 6 characteristics of the job is the motivating potential score (MPS).

3.3. Method of analysis

The first step in testing measurement invariance is to assess whether the factor structure of the academic version of JDS can be replicated across different groups. A confirmatory factor analysis (CFA) examined whether the second-order factor model of teaching adapted version of JDS validated in previous studies, (Authors 2013b) with the total sample, can be replicated in each of the three groups.

If the results of the baseline CFA suggests that the same second-order factor model fits in the three groups, the next step is to assess MI across groups. The invariance testing process involves several steps of increasingly restrictive measurement assumptions (Byrne and Stewart 2006; Millsap and Yun-Tien 2004; Vandenberg and Lance 2000; Widaman and Reise 1997). We applied the multistep process suggested by Steenkamp and Baumgartner (1998).

We employed multigroup confirmatory factor analysis (MG-CFA) using the programme EQS 6.1 and robust maximum likelihood estimation. As goodness of fit indexes, we used the Satorra-Bentler scaled chi-square adjusted to nonnormality ($SB\chi^2$) with robust standard errors (Satorra and Bentler 1994, 2001). Although the $SB\chi^2$ difference statistic has been the primary criterion, we used other index in this study, such as, the Robust Comparative Fit Index (RCFI) whose value should be above .90 for a good fit. Also, following Hu and Bentler (1999) considerations, we used the RMSEA (Standardized Root Mean Square Residual), whose value should be less than .08 to indicate a good fit (Hair et al. 1998).

4. Results and discussion

The results of CFA revealed that the second-order factor model was replicated in the three groups. Although the value of χ^2 is non-significant in all cases (p-value = .00021, .00000, .00126) the values of the other indexes are above or very close to the limit value for a good fit, except in the sample of FBAM 0809 where MFI and RMSEA are lower and upper its ideal values (MFI = .714 and RMSEA = .090).

We tested configural invariance across surveys modes. We began by equality of means, to continue with equality of variances and covariances matrixes. Then, we tested metric invariance across surveys models, constraining factor loadings in each group separately. The value of $SB\chi^2$ change (p-value = .041850757) is significant with a 90% confidence level and allow us to accept that the nested model was still well-fitting therefore we could not reject the hypothesis null. Next, we evaluated if scalar invariance can be established constraint the intercepts of both surveys modes. The value of $SB\chi^2$ change is very significant (p < .001), which indicates that the scalar invariances was not supported. However, if we consider again the value of Robust CFI (RCFI=.939) and Robust RMSEA (.061), we can cautiously establish that there is scalar variance across the three groups. The next step is to test if there are differences in covariance among latent factors across three groups. Since scalar invariance could be established with caution, we conducted this test, imposed restrictions on the metric invariance model.

This comparison yielded a value of $SB\chi^2$ change significant, (p -value = .12299) and we can state that there is covariance invariance across groups. To evaluate variance invariance of latent factors is necessary adds a new restriction about the standard errors across survey modes. If we can establish factor latent variance invariance across groups, as covariance invariance have yet established, correlation across latent factors will be the same across groups, which mean that the relation of the factors with the PMP is the same in the original model, independent of the group. As the change of p -value achieved when comparing the $SB\chi^2$ index is .01556, so we can accept that invariance across latent factors is equivalent across samples with 90% confidence level, as well as the values of the robust CFI (RCFI = .936) and robust RMSEA (RRMSEA= .055). Finally, we analyzed the invariance of measurement errors variance across samples. In this case, as we can see in Table 13, the p -value for the change of $SB\chi^2$ is .66187, so we can state that reliability of the surveys items is similar between the students of the three degree programs. The hypothesis made for each model are summarize in Table 1.

Table 1. Hypothesis made in each of the studied invariances

Model	Analysed Invariance	Equation of the hypothesis ^c	Hypothesis Test ^a
1	Configural	$\Delta_{Form}^{(1)} = \Delta_{Form}^{(2)}$	Complete fit (The number of items which represent each construct is the same for each group)
2	Metric	$\Delta^{(1)} = \Delta^{(2)}$	2-1
3	Scalar	$\lambda_{ij}^{(1)} = \lambda_{ij}^{(2)}$	3-1
4	Equality of covariance	$\Phi_{jj}^{(1)} = \Phi_{jj}^{(2)}$	4-2
5	Equality of factors variance	$\psi_{jj}^{(1)} = \psi_{jj}^{(2)}$	5-4
6	Equality of measurements errors variance	$\theta_{\varepsilon}^{(1)} = \theta_{\varepsilon}^{(2)}$	6-5

Note:

^aIn each case, the statistic for testing the hypothesis is the difference between the fit of the constrained model and that of a less constrained model. For example, the test statistic for Hypothesis 1 is the fit difference between Model 2 (with construct-level constraints) and Model 1 (with no constraints). This is indicated in the table as “2 – 1.”

^bParenthetical superscripts indicate groups. In this case there are only two-group

^c Δ Theoretical base for each model (items variances and means)

λ Relation between each item and the latent factor

Φ Covariances across factors

Θ Measurement errors variance

5. Conclusions

The purpose of our study was to evaluate if the underlying factor structure of the teaching version of JDS was equivalent with data collected across different samples. Results show that the global model proposed to evaluate the relationship between satisfaction, MPS and job characteristics is invariant across the samples, regarding to configural, metric, covariance, latent factors and measurement error of latent factors invariance. We have not had scalar invariance, but it is only a requirement when comparing means of latent factors, because it would mean that comparisons of this parameter across groups could be biased due to differences on scales and data sources (Cheung & Rensvold, 2002). Chen (2007) established there would be not such a big difference across the groups, if the scale would have offered a similar reliability in all groups. So the non-fulfilment of scalar invariance is not important for the purpose of this study.

For these reasons, we can conclude that the three samples can be considered equivalent, with the same factor structure, factor loadings, measurement errors of factors and the same reliability even when complete invariance could not be proved. As Van de Schoot, Lugtig and Hox (2012) set out, when checking if factor loadings, items coefficients and residual variances are equivalent across groups, we can state that comparisons made across groups are valid at all levels.

References

- Adler, R. W., Milne, M. J., & Stablein, R. (2001). Situated Motivation: An Empirical Test in an Accounting Course. *Canadian Journal of Administrative Sciences*, 18, 101-115.
- Ames, C. (1992). Classrooms: Goals, Structures, and Student Motivation. *Journal of Educational Psychology*, 84, 261-271.
- Armstrong, M. J. (2003). Students as Clients: A Professional Services Model for Business Education. *Academy of Management Learning and Education*, 2, 371-374.
- Authors. (2013b). Validation of the JDS satisfaction scales applied to educational university environments. *Journal of Industrial Engineering and Management*, 7(1), 72-99. doi:10.3926/jiem.906
- Byrne, B. M. & Stewart, S. M. (2006). The MACS approach to testing for multigroup invariance of a second-order structure: a walk through the process. *Structural Equation Modeling*, 13(2), 287-321.
- Chen, F. F. (2007). Sensitivity of goodness of fit indices to lack of measurement invariance. *Structural Equation Modeling*, 14, 464-504.
- Cheung, G. W. & Rensvold, R. B. (2002). Evaluating goodness-of-fit indices for testing measurement Equivalence. *Structural Equation Modeling*, 9, 233-255.
- De Treville, S. & Antonakis, J. (2006). Could Lean production job design be intrinsically motivating? Contextual, configurational, and levels-of-analysis issues. *Journal of Operations Management*, 24, 99-123.
- French, B.F. & Finch, W.H. (2008). Multigroup confirmatory factor analysis: Locating the invariant referent sets. *Structural Equation Model*, 15(1), 96-113.
- Fried, Y. (1991). Meta-analytic comparison of the job diagnostic survey and job characteristics inventory as correlates of work satisfaction and performance. *Journal of Applied Psychology*, 76(5), 690-697.
- Griffin, R.W. (1991). Effects of work redesign on employee perceptions, attitudes and behaviours: A long-term investigation. *Academy of Management Journal*, 34, 425-435. doi:10.2307/256449
- Hackman, J. R. & Oldham, G. R. (1975). Development of the Job Diagnostic Survey, *Journal of Applied Psychology*, 60(2), 159-170.
- Hair, J. F.; Anderson, R. E.; Thatam, R. L. & Black, W. C. (1998) *Multivariate data analysis*, (6th edn.). New York, Prentice Hall International.
- Hu, L. & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1-55.
- Millsap, R. E., & Yun-Tein, J. (2004). Assessing factorial invariance in ordered-categorical measures. *Journal of Multivariate Behavioural Research*, 39, 479-515.
- O'Neil, D. A. & Hopkins, M. M. (2002). The Teacher as Couch Approach: Pedagogical Choices for Management Educators. *Journal of Management Education*, 26, 402-414.
- Paris, S. G. & Turner, J. C. (1994). Situated motivation. In P. Pintrich, D. Brown, & C. Einstein (Eds.), *Student motivation, cognition, and learning: Essays in honor of Wilbert J. McKeachie* (Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.)
- Richardson, J. T. E. (2005). Instruments for obtaining student feedback: a review of the literature. *Assessment & Evaluation in Higher Education*, 30, 387-415
- Satorra, A. & Bentler, P.M. (1994). corrections to test statistic and standard errors in covariance structure analysis. In A. von Eye & C. C. Clogg (Eds.), *Analysis of Latent Variables in Developmental Research* (pp. 399-419). Thousand Oaks, CA: Sage.
- Steenkamp, J.B.E.M. & Baumgartner, H. (1998). Assessing measurement invariance in crossnational consumer research. *Journal of Consumer Research*, 25, 78-90.
- Ünal, C. & Inan, H. Z. (2010). Students' perceptions of a situated learning environment. *Procedia - Social and Behavioral Sciences*, 2, 2171-2175.
- Vandenberg, R.J. & Lance, C.E. (2000). A review and synthesis on the measurement invariance literature: Suggestions, practices and recommendations for organisational research. *Organizational Research Methods*, 3, 4-70.
- Van de Schoot R., Lugtig P. & Hox J. (2012). A checklist for testing measurement invariance. *European Journal of Developmental Psychology*, 9(4), 486-492. DOI: 10.1080/17405629.2012.686740
- Widaman, K. F., & Reise, S. P. (1997). Exploring the measurement invariance of psychological instruments: Applications in the substance abuse domain. In K. J. Bryant, M. Windle,. (Eds.), *The science of prevention: Methodological advance from alcohol and substance abuse research* (pp. 281-324). Washington, DC: American Psychological Association.

WEB 2.0 TOOLS FOR THE L2 CLASS

Karina Antonia Fadini¹ & Kyria Rebeca Finardi²

¹*Master Student in Applied Linguistics - Federal University of Espírito Santo; Language Teacher at Federal Institute of Espírito Santo, Arino Gomes Leal Ave., 1700, 29700-660, Colatina, ES (Brazil)*

²*PhD in English and Applied Linguistics, Professor of Department of Languages, Education and Culture, Federal University of Espírito Santo, Fernando Ferrari Ave., 514, 29075-910, Vitória, ES (Brazil)*

Abstract

Based on the concept of '*produsage*' (Bruns, 2008), the present study suggests ways to use and produce contents using web 2.0 tools for the teaching-learning of English as an additional language (L2). Finardi, Prebianca and Momm (2013) suggest that in the globalized world we live in, some knowledge of English and digital literacy are important skills to access information online. Finardi and Porcino (2014) reviewed the role of technology in L2 learning, concluding that internet has changed the way we use, learn and teach languages. Based on these assumptions, the present study aims at offering a review of internet tools to support, integrate and/or complement L2 classes teaching/learning/using. The tools reviewed and proposed may lead to creative productions in L2, as well as offer opportunities to use the language in contextualized manners. Another objective of the proposal is to enable L2 teachers/learners/users to develop their digital literacy defined as the ability to find, evaluate, utilize, share, and create content using information technologies and the internet (Casey & Bruce, 2010). Overall, five tools were reviewed – each one for a different teaching/learning/using purpose. Results of the analysis of tools reviewed in this study seek to contribute to the informed use of technology in L2 teaching/learning/using.

Keywords: *Web 2.0 tools, L2 teaching-learning, digital literacy, produsage.*

1. Introduction

A reflection on the impact of current changes in education in general, and in English language teaching (ELT) in particular is necessary to keep pace with technological and social progress. We can say that until recently the book and other types of printed materials and lectures prevailed unchallenged (and still prevail in many Brazilian contexts) as teaching materials and methodologies (Finardi; Porcino, 2014). Yet, postmodernity shows that the innovation that the school environment needs goes beyond the choice of materials and methodologies. Finardi, Prebianca and Momm (2013) alert us to the fact that in the "information age" (Levy, 1999) much of the information is "digitalized" (Lankshear; Knobel, 2003, p.155), and available online and in English. In this scenario, some literacy in these two languages (English and digital literacy) is necessary to provide social inclusion and the exercise of a global citizenship.

Regarding the role of technology in L2 education, Finardi (2012), reviewed four cases of hybrid approaches to L2 teaching-learning concluding that the integration of technology in traditional classes seems to be the best choice in terms of teaching methodologies. Yet, Teixeira and Finardi (2013) and Finardi *et al.* (2014) showed that Information and Communication Technologies (ICTs) are underused in Brazil, mainly due to teachers' beliefs and (lack of) conditions to integrate them in traditional classes.

When it comes to the use of internet in L2 education, Finardi and Porcino (2014) claim that internet has changed the way we use, learn and teach additional languages, especially after the advent of the web 2.0. One of the reasons for this paradigm change relates to the many possibilities of interaction (action between subjects mediated by technology) and interactivity (action between subject and technology) fostered by the web 2.0 for L2 teaching/learning/using.

In the web 2.0 paradigm, the relationships between those involved in the movement of learning are built in multidirectional interaction networks (student-student, student-teacher, student-teacher-world-knowledge), allowing the view of the L2 class (or learning/using experience for

that matter) as a collective and collaborative construction, capable of considerable produsage¹, especially if we take the technology and language as access tools to the produsage of knowledge and information. The changes and advantages made possible by ICTs and internet are not limited to materials and teaching methods but they can also propose a reshaping of education where all learn, teach, use, consume and produce knowledge. In order to help L2 teachers, students and users to incorporate the role of agent, mediator, facilitator, creating opportunities for L2 and digital literacy development, the present study reviews web 2.0 tools that can be used in the teaching/learning/using of English as an additional language.

2. The use/integration of technology in Brazilian classrooms

The role of technology in education has proved to be an area with many promises and questions at the same time. While the informed use of technology has been questioned together with the use of computers, tablets and smartphones in Brazilian schools, much resistance to the incorporation of technologies in education still exists, mainly because of the lack of teacher training and education for their use (Teixeira; Finardi, 2013; Finardi *et al.*, 2014).

Technology affects teaching/learning processes as well as individuals (Almeida, 2010). They bring with them a need to acquire new skills, which Lankshear and Knobel (2003) call "new literacies". Warschauer (2003) claims that there are two forms of access to technology, the limited access refers to machines and pieces of equipment whereas the ample access refers to the critical use of these pieces of technology. According to him, only the latter can lead to social capital formation understood as the individual's capacity to generate benefits for them or their communities through their social networks and relations. In this sense, the critical use of technology in education must encompass much more than the simple "use" of equipment.

In order to make an informed incorporation of technology in education, it is important to have in mind the goals and the ways in which the technologies available can be used in and with teaching methodologies. Since much of the resistance to the incorporation of technologies in L2 methodologies comes from teachers as shown in Teixeira and Finardi (2013) and Finardi *et al.* (2014), this study aims at reviewing five web 2.0 tools that can be incorporated in L2 teaching practices from the perspective of teachers thus aiding L2 teachers to make informed decisions and L2 learners/users to benefit from technology.

3. Design

As previously stated, this study aimed at reviewing five web 2.0 tools to make suggestions on how they could be incorporated in L2 teaching/learning practices. Each tool was meant for a different teaching purpose and was chosen among over one hundred possibilities shown in the Results of the 8th Annual Survey of Learning Tools², which compiled a list from 1,038 votes of learning professionals from 61 countries worldwide, published on 22 September 2014.

4. Web 2.0 tools

In the early 2000's a new generation of web tools appeared, differing from the "read only web" (web 1.0) created before them, and allowing anyone to create content online for low cost or even for free, sharing and collaborating contents online. With the "read & write web" (web 2.0) the user is not passive anymore: people can select and produce contents with fast access to different pages. Besides that, the web 2.0 acquired a new dimension for its potential for social purposes and interactions. A learning tool can be defined as any software or online tool or service used either for people's own personal or professional learning, for teaching or training. The following review aims to identify features of some p 2.0 web tools that can be incorporated in L2 teaching practices. The review describes strengths and weaknesses of the selected tools, with their challenges for the use in L2 classrooms.

¹Produsage is a term coined by Axel Bruns in his book "Blog, Wikipedia, Second Life and Beyond: from production to produsage" (2007). It refers to the type of user-led creation, that is, users can also play a role of creators, and it shows how the boundaries between passive consumption and active production have faded, hence the portmanteau of the words "production" and "usage".

² More information available on the website: <http://c4lpt.co.uk/top100tools/>

4.1. Web tool for reading practice – DIIGO³

It is a cloud-based personal information management system. It provides tools to collect and access a variety of information that goes to a library on the Diigo server, in the cloud, so that the user can access it anywhere. That is, after Diigo browser is installed, the user can select, highlight and have keynotes of different shapes that stay on the page to access the same page, with the same annotation system, on their personal computer, tablet, iPhone. It is the highest ranked social bookmarking tool on the research of the 8th Annual Survey of Learning Tools. Though it is not a produsage tool, it collaborates with the processes of searching and reading that the creator has to do before the production itself.

This resource sharing tool allows collaborative work and one can also share his/her findings and get some feedback through highlights, sticky notes or screenshots. Groups can be created for classes, for teaching the design of group projects, for instance, and also join other groups of people that are commenting on topics of interest, or conduct searches for topics already researched and commented about on Diigo. It is a relevant organizational tool, especially because the lists of websites can be archived and organized by category or searched, rendering the search process easier. The inconvenience of this tool relies on its printing which requires screen capture and comments made on the findings are not viewed on the printed paper.

4.2. Web tool for speaking practice – VOICETHREAD⁴

VoiceThread is a web-based application that allows users to create a timeshare presentation in any form of digital media, such as a media album in which visitors can, asynchronously, comment in text, image, audio (including their own voice) or video. The output resulting from this combination of digital presentation and comments from viewers accumulated is called "VoiceThread." Once they are completed, voicethreads can be shared across web pages or blogs, and can be exported for use offline, computer hard drive, DVD, mobile phone, among others.

With the growing collaboration of technology in education, more and more teachers have sought tools to facilitate group interaction and teamwork in their classrooms. VoiceThread is a tool that fits this trend because it is easy to learn which is why it has been used by many students to have a voice and express their opinions without the pressure of having to make sentences face-to-face and online (without any prior planning) in class. A teacher can ask the students to make videos, show photographs and narrate comments, tell stories related to any topic they may find interesting to his/her pupils, for example, and according to studies such as Light and Polin (2010), for instance, students will probably find it funnier to produce a voicethread than writing in a paper, focusing more in the creative process than in the language structures.

One disadvantage of VoiceThread is the inability to allow multiple users to have access to the same account simultaneously, which requires every student to have their own login, and collaboration. Also, free accounts are more limited than paid accounts when it comes to space and restrictions of editing and viewing capabilities. Yet, the advantages, especially for speaking practice, out-weigh these disadvantages.

4.3. Web tool for listening practice – PODCAST⁵/VIDEOCAST

Podcast is a digital medium that consists of an episodic series of audio streams, that is, it is a program (as of music or talk) made available in digital format for automatic download over the Internet. The word is derived from "broadcast" and "pod" from the success of the iPod, as audio podcasts are often listened to on portable media players. If it is a "video podcast" (vodcast/videocast), it includes video clips. According to Berry (2006), it is a horizontal media form, that is, producers are consumers and consumers may become producers and engage in conversations with each other. And if the user chooses to subscribe to a podcast feed, she/he can automatically download any podcast.

With podcasting, the listener can download the file and replay it at anytime is convenient for her/him. If the teacher wants all students to hear (over and over, if necessary) what s/he has to say, podcasting is a relevant option. Students can also record themselves speaking about a topic or even reading their favorite story and then upload the podcast to the class website, where they are able to share and access and listen to it at home, for example. Then they can check pronunciation, intonation, and the pace of their speech, allowing them to verify what they need to improve in speaking. Also, the podcast creator can turn the material into a written transcript as well to make it more accessible.

In order to make a podcast, it is necessary to have a computer or smartphone, software to record the presentation and a connection to upload it to the Internet. If the person uses someone else's

³ Official website: www.diigo.com

⁴ Official website: <https://voicethread.com/>

⁵ Though it was first created by iPhone, through iTunes –it can still be found on <http://www.apple.com/itunes/podcasts/> - there are diverse websites for podcasts, with diverse themes.

copyrighted material in his/her podcast, one has to take steps to protect it against unauthorized copying and file sharing. There are some important issues that need to be addressed, including legal concerns over ownership of the content and debate over if the podcasts are going to be public or private too, and that are not covered here for constraints of space but can be viewed in the Langbein's (2010) study.

4.4. Web tool for creative writing - PIXTON⁶

The Web 2.0 implies the acceptance of flexible choices, that is, it allows people, regardless of any talent as an artist, comedian or web design expertise, to create their own comic strip, for example. Pixton is the comic strip creation website that allows as much customization as possible without the need to build from scratch. There are options to adjust the color, shape, sleeves and size of a shirt, for instance. Instead of relying on preset poses and emotions for each character, users are able to click and drag character limbs into new postures and can customize eyes, ears, noses and hairstyles. And there is a plus: it is convenient not only to choose a background from a big variety of atmospheres, but one can also add images from Flickr or Google images.

Users are required to register online to create a comic. There are three user account types available: Pixton for Fun, Pixton for School, and Pixton for Business. Pixton for School allows for a private and secure space where teachers are able to moderate student creations and publish them in the student gallery. Students are then able to read and comment on each others' work. An interesting feature is the permission for recording voice-overs for the characters, which allows students to check their pronunciation too. Pixton can be used to apply vocabulary by summarizing a book, for example, it can be used to explain and practice the characteristics of a comic book, it can be used to demonstrate comprehension of many kinds, and develop creative and critical thinking skills.

4.5. Web tool for collaborative work - PADLET⁷

Padlet, is an online noticeboard maker. Ideal for making announcements, keeping notes and things people can do with Post-its. Previously known as Wallwisher, this tool allows people to add members to your wall, a virtual notepad, and share ideas collaboratively. A teacher just needs to create a username, build a wall and share the link to the class that will join in. Students do not need to create a username to access it, what will depend on the teacher's choice of privacy settings.

This tool is a relevant resource for group work because with Padlet students can all see on the same page the notes of every groups and no information is missed. They can make a poem wall, a character analysis if they are reading a book or studying adjectives, a community word wall to express their feelings about the class, for instance, just to mention some examples of what a "simple wall" can provide, also by integrating other tools to make videos, to record audio, to edit photographs and post on the same wall.

5. Conclusion

The aim of this study was to suggest ways to use and produce contents using web 2.0 tools for the teaching/learning/using of English as an additional language (L2). With that aim, the present study reviewed internet tools to support, integrate and/or complement L2 classes. Overall, five tools were reviewed – each one for a different teaching/learning purpose. Results of the study suggest that the tools analyzed show potential to positively impact L2 teaching/learning practices.

Given these advantages to incorporate these tools in L2 classes, the study concludes that for that to happen more frequently in Brazil and notwithstanding, political and structural problems associated with this inclusion there, the key factor appears to be teacher motivation to use technology in their practice and so the study suggests teacher training and education programs to support the inclusion/integration of technologies in L2 classes.

The tools presented here are just a few options in the myriad of possibilities we may find available online. The Web 2.0 tools reviewed here may need teachers' management of classroom activities and materials, but they can also be used for the learners to use and produce contents online in or out of class, thus optimizing contact with and in the target language. As for teachers, although it is not necessary for them to have deep expertise in the use of technology, they do need to know how to deal with unexpected online situations, such as how to integrate one tool with another, to download, share or present the production, and they also need to be conscious of the purpose of the activity to be included on the class to turn it into a hybrid experience.

⁶ Official website: www.pixton.com

⁷ Official website: www.padlet.com

With that in mind, it is also important to remember that the networked nature of web 2.0 has been blurring the traditional boundaries between school and home, and other cultural and communicational aspects are also reshaped with web 2.0: especially on how, what, where, when and with whom people communicate. These changes bring along challenges for educators and internet users and require the constant reflection on the informed and critical use of technology in the service of education.

References

- Almeida, L. H. T. (2010) Aprendizagens e tecnologias contemporâneas: um novo modo de ser e aprender? *Revista Caminhos em Linguística Aplicada*, 3 (2), 37-52, Unitau. Retrieved 17 april 2015 from www.unitaus.br/caminhosla.
- Berry, R. (2006). Will the iPod kill the Radio Star? Profiling Podcasting as Radio. *Convergence: the international Journal of Research into New Media Technologies*: 143-162. Retrieved 10 april 2015 from http://tonisellas.cat/wp-content/uploads/2007/01/ipod_kill_radio.pdf.
- Brasil, Ministério da Educação. (1996) Lei de Diretrizes e Bases da Educação – LDB. Brasília: MEC.
- Brasil, Ministério da Educação. (2009) Plano Nacional de Educação - PNE. Brasília: Inep. Retrieved 18 april 2015 from http://pde.mec.gov.br/index.php?option=com_content&view=article&id=122:tecnologias-dainforma-ciclo-avanco&catid=27:educa-superior.
- Brasil/SEMTEC. (2002) Parâmetros Curriculares Nacionais: ensino médio. Brasília: MEC/Semtec.
- Bruns, Axel (2007). Produsage: Towards a Broader Framework for User-Led Content Creation. *Creativity and Cognition: Proceedings of the 6th ACM SIGCHI conference on Creativity & cognition*, ACM, Washington, DC.: 99.
- Finardi, K. R.(2012) Technology and L2 learning: Hybridizing the curriculum. In: Beck, M. S. & Silveira, R. & Funck, S. B. & Xavier, R. P. (Orgs.) *III Congresso Internacional Abrapui, Language and Literature in the Age of Technology-Anais*, 1, 1-8. Florianopolis: Universidade Federal de Santa Catarina.
- Finardi, K. R. & Porcino, M. C.(2014) Tecnologia e metodologia no ensino de inglês: impactos da globalização e da internacionalização. *Revista Desterros*, n. 66.
- Finardi, K. & Prebianca, G. & Momm, C. (2013) Tecnologia na educação: o caso da internet e do inglês como linguagens de inclusão. *Revista Cadernos do IL*, 46, 193-208.
- Finardi, K. & Teixeira, D. & Prebianca, G. & Dos Santos Junior, V. (2014) Information technology and communication in education: two sides of the coin in Brazil. *International Journal of Recent Contributions from Engineering, Science & IT (iJES)*, 2, 21-25.
- Langbein, M. (2010). Podcasting Advantages & Disadvantages in Education. In *Proceedings of World Conference on Educational Media and Technology*, 1747-1752. Association for the Advancement of Computing in Education (AACE).
- Lankshear, C. & Knobel, M. (2003) New Literacies: changing knowledge and classroom learning. Buckingham: Open University Press.
- Lévy, P. (1999) Cibercultura. Tradução de Carlos Irineu da Costa. São Paulo: Editora 34.
- Light, D. & Keisch, D. (2010) Integrating Web 2.0 tools into the classroom: changing the culture of learning. Center for Children and Technology. New York, NY. p. 18.
- Teixeira, D. & Finardi, K. (2013) TICs no ensino presencial: evidências de um curso de formação continuada na Universidade Federal do Espírito Santo. *Contextos Linguísticos*, 7, 79-96.
- Warschauer, M. (2003) Social capital and access. *Universal Access in the Information Society*, 2, (4). Retrieved 11 april 2015 from http://education.uci.edu/Department%20of%20Education/Department%20of%20Education_oldweb2007-2014/gse_web_site_prod/person/warschauer_m/docs/soccap1.pdf.

ANALYZING MORAL EDUCATION IN SCHOOLS IN GERMANY

Birgitta Maria Kopp, Sandra Niedermeier & Heinz Mandl

Department of Psychology, Ludwig-Maximilians-University, Munich (Germany)

Abstract

The main objective of this study is to introduce a model for analyzing moral education in institutions and to exemplify this model with data of projects fostering moral education in schools in Germany. Our model includes five levels, namely (1) objectives of practical moral education, (2) the macro-level of politics, society, and religion, (3) the meso-level of the single institutions, (4) the micro-level of interactions between human beings, (5) and the results of practical moral education. The presented model is exemplified by projects which were launched in schools in Germany in the years 2009 to 2014. We identified 51 school projects which were analyzed according to our model. Results show that using this model for analyzing moral education is an effective way to get a systematic overview of different projects. Even though objectives, meso-level and micro-level are reported, often, key issues for evaluating the effectiveness of the projects on moral education are missing.

Keywords: *Model for analyzing, value education, institutions, schools.*

1. Introduction

Moral education is an important topic in countries all over the world. One main point in moral education is the way, how it could be fostered by different institutions, mainly schools. There are different methods of realizing the support of moral education. One is the initialization of projects. In order to compare projects according to relevant issues for moral education, a model for analyzing such projects is necessary. But there exist no specific model for analyzing moral education in a coherent way that enables researchers to get a picture about relevant categories for moral education and to compare such categories according to relevant criteria.

Fostering moral education is partly realized by the curriculum in schools in Germany. In other countries like the US or GB, character education is explicitly part of the curriculum in schools. Thus, moral education using specific programs or projects is not as crucial in these countries as it is in Germany. However, in Germany projects are more important for moral education. Moreover there is no model for analyzing such projects in order to get an overall picture.

Therefore, we wanted to generate a model for analyzing moral education. In order to do this, we had a closer look on two issues: First, we looked at socialization processes and models, because moral education is part of the socialization process of each individual (Lapsley & Stey, 2014). Second, we focused on relevant issues which are relevant for the project practice, namely the input-process-output (IPO) model (Bushnell, 1990). We identified three relevant categories from socialization models, namely the macro-level, the meso-level, and the micro-level (Blackstone, 2015), and two categories from the IPO model, namely objectives and results of practical moral education (Bushnell, 1990). Thus, our model for analyzing moral education in schools comprised five categories

1. Objectives of moral education

Each project needs objectives as initiating starting point. One main aim is the support of moral education in terms of moral values and moral behavior, but there are diversified objectives taking the respective target group and their developmental stage into account. Therefore, projects which are launched for young children from 6 to 10 years may be differently than projects for teenager between 11 and 15 years.

2. Macro-level: the regulatory framework of politics and society

On the macro-level, we find the regulatory framework of politics and society. This means that in different political and cultural systems, different frameworks are adapted to moral education. Even though, the macro-level is not often picked out as central theme, there are great differences between political and cultural systems, e.g. between Western and Eastern countries (Fung, 2006; Trommsdorff, 1996). But also in Germany there are differences between East- and West-

Germany in moral education showing cultural differences even within one country (Trommsdorff, 1999).

3. Meso-level: the structures of the institutions
Regarding the meso-level, there are several issues relevant: (1) the structures within each societal level for socialization, (2) the climate, (3) the actors, (4) the planning and realization of projects, and (5) the structures between the diverse societal levels for socialization.
4. Micro-level: theories of moral education and methods to foster moral education
On the micro-level, we find the interaction between teachers and students as well as single methods which are used in order to foster moral education.
5. Results of moral education in practice
Results include abstract moral values as well as moral behavior. Regarding moral values, the single values as well as the knowledge and sensitization about these values is relevant. Moral behavior includes the transfer of morality into action (Lickona, 1991) including behaviors like sharing, donating to charity or telling the truth as well as the tendency to act with e.g. honesty, responsibility, or altruism (Berkowitz, 2011).

2. Design

Our research was based on the introduced model for analyzing moral education in schools. We made a cross-section study that collected data of all projects that were launched in Germany in the socialization levels for schools in the five years between 2009 and 2014. All projects had to be documented. We identified 51 projects which were launched in schools in the years 2009 to 2014 in order to foster moral education for pupils.

3. Objectives

The main objective of the study was to introduce a model for analyzing moral education in institutions and to exemplify it with data of projects fostering moral education in schools in Germany. Therefore, our main research question is: *Does the model for analyzing moral education in schools in Germany fit to the actual project data?*

4. Methods

4.1. Data sources

To identify the projects, we looked at (1) current literature (e.g. empirical studies or evaluations), (2) political documents (e.g. laws), (3) internet research (e.g. Google scholar) and (4) databases (e.g. www.phineo.org, www.demokratisch-handeln.de; www.land-der-ideen.de or www.bildungsserver.de).

4.2. Data analyses

Based on our theoretical model, all information was inductively analyzed according to the main issues “objectives”, “macro-level”, “meso-level”, “micro-level”, and “results”. The meso-level was subdivided into the categories (1) the structures within each societal level for socialization, (2) the climate, (3) the actors, (4) the planning and realization of projects, and (5) the structures between the diverse societal levels for socialization. The micro-level included (1) the theories and approaches for moral education as well as (2) the methods which were used to foster moral education.

We coded the documented information of each project according to the developed coding scheme. Multiple answers per criterion were possible in every project. We counted all similar answers descriptively to one score. Ten per cent of the codes were double-rated by a second rater.

5. Results and discussion

In order to see, whether the introduced model is adequate for analyzing projects on moral education in Germany, we had a closer look to the five main categories of the model.

Regarding the **objectives**, we found 22 different objectives which were mentioned in the analyzed projects. The most often mentioned aim is cohesion with 12 naming, followed by democratic behavior (6 times), transmission of values (4 times), moral education (4 times), value argumentation (4 times), and integration into work (4 times). Objectives, which were mentioned 3 times, were participation, conflict resolution, and responsibility/responsible behavior. Two times were named for right-wing extremism, commitment, and integration. Furthermore, there were a lot of single objectives like reflection, social competences, positive school climate, solidarity, etc.

On the **macro-level** we find the German Basic Law, the constitution of every federal state in Germany, and the school laws of each individual school. The main issue in all these documents is the educational mandate to educate students to become an integral personality including moral education and the attitude towards values. Values which are mentioned most often in this context are democracy, liberty, respect, and responsibility.

The **meso-level** include (1) the structures within each societal level for socialization, (2) the climate, (3) the actors, (4) the planning and realization of projects, and (5) the structures between the diverse societal levels for socialization. Looking at our project work, we could analyze category 3, the actors, and category 4, the planning and realization of projects. These two aspects are crucial for the initiation of projects on moral education in schools. On the actors side, we found 12 private actors, 10 associations, 7 public actors, 5 foundations, 5 schools, 4 churches, 1 association not for profit, and 1 non-governmental association.

Regarding the planning and realization of the projects, 12 different persons were named. Most often teachers took the most important part (22 times), followed by pedagogical specialists (15 times), educators (12 times), youth leaders (12 times), and mentors (5 times).

On the **micro-level** there are theories and approaches for moral education as well as methods to foster moral education. In the projects, no theories and approaches for moral education were explicitly mentioned. But there is a big amount of different methods which were used. Overall, 34 different methods were reported. Most often, project work was indicated (19 times), followed by mentoring (8 times), role model (7 times), value discussion (6 times), role plays (6 times), theater (5 times), training (4 times), and experience learning (4 times).

Looking at the **results** of the projects, there are no effects reported which could be seen on the side of the target group.

6. Conclusions

Our research question regarding the fit between our model for analyzing moral education and the reported data could be answered positively. In most cases, the categories which were chosen in our model fit to the information of the projects. This makes it possible (1) to analyze the data and (2) to compare different projects with each other based on such objective criteria. Furthermore, results which are the key issues for evaluating the effectiveness of the projects on moral education are most often missing. This is an indication that projects should focus more on the outcomes of their methods, not only on the methods themselves. Methods are only means to gain specific results, but they could not indicate the effectiveness of certain projects. Therefore, it is necessary to focus more on the outcome of projects on moral education in Germany.

References

- Berkowitz, M. W. (2011). *The science of character education*. Hoover Press: Stanford.
- Blackstone, A. (2015). *Principles of sociological inquiry: qualitative and quantitative methods*. Flat World Education.
- Bushnell, D. S. (1990). Input, process, output: A model for evaluating training. *Training and Development Journal*, 44(3), 41-43.
- Fung, H. (2006). Affect and early moral socialization: Some insights and contributions from indigenous psychological studies in Taiwan. In U. Kim, K. S. Yang, & K. K. Hwang (Eds.), *Indigenous and cultural psychology: understanding people in context* (pp. 175-196). New York: Springer.
- Lapsley, D. & Stey, P. C. (2014). Moral self-identity as the aim of education. In L. Nucci, D. Narvaez, & T. Krettenauer (Eds.), *Handbook of moral and character education* (pp. 84-100). New York: Routledge.
- Lickona, T. (1991). *Educating for Character*. New York: Bantam.
- Trommsdorff, G. (1996). Werte und Wertewandel im kulturellen Kontext aus psychologischer Sicht [Values and value change in a cultural context from a psychological perspective]. In E. Janssen, U. Möhwald, & H. D. Ölschleger (Hrsg.), *Gesellschaften im Umbruch? Aspekte des Wertewandels in Deutschland, Japan und Osteuropa [Societies in change? Aspects of value change in Germany, Japan, and Eastern Europe]* (pp. 13-40). Munich: Iudicium.<http://kops.ub.uni-konstanz.de/volltexte/2010/10151/>
- Trommsdorff, G. (1999). Sozialisation und Werte [Socialization and values]. In G. Berger & P. Hartmann (Hrsg.), *Soziologie in konstruktiver Absicht. [Sociology under constructivist perspective]*. (S. 167-190). Hamburg: Reim.

A REMOTELY CONTROLLED EXPERIMENT TO DETERMINE THE EARTH'S MAGNETIC FIELD

**Marco Aurélio Alvarenga Monteiro¹, Isabel Cristina de Castro Monteiro¹,
Leonardo Mesquita¹, Galeno José de Sena¹ & José Silvério Edmundo Germano²**

¹UNESP – Universidade Estadual Paulista “Julio de Mesquita Filho” –

Av. Dr Ariberto Pereira da Cunha, 333 – Portal das Colinas – Guaratinguetá – SP (Brazil)

²ITA – Instituto Tecnológico de Aeronáutica – Praça Marechal do Ar Eduardo Gomes, n 50 - Vila das Acácias São José dos Campos – SP (Brazil)

Abstract

It has been pointed out in the literature that, besides the traditional classes, the teaching of scientific concepts should consider a variety of learning situations and teaching techniques, as, for instance, the use of experimentation. Laboratory practices favor, among other aspects, the contextualization of the theoretical concepts, linking them to real world phenomena.

Unfortunately, in the context of the Brazilian public high schools (and even in the majority of the private ones), the Physics teacher very seldom has at his or her disposal a laboratory, ready and appropriate, which he or she can use to take advantage of experiments and demonstrations. Moreover, in Brazil usually the teachers are not well prepared to explore all benefits that an experimental activity could provide. In-service courses are not enough to fill the gap, due to both the high workload of the teachers, not being uncommon to find teachers who work at more than one school, and the usual lack of even a room for experimental activities in the schools.

An alternative that has been offered to overcome the limitations of the lack of laboratory and experimental equipment in high schools is the use of remotely controlled laboratories. The Remote Laboratory, in general, offers access to equipment, countertops and real laboratory experiments via a computer connected to the Internet. Thus, a user can, through a computer with internet access, perform the experiment in a real way, remotely controlling the actions at a distance: adjusting the equipment and collecting data. Notice that this is not a simulation, but a real experience in which a web server allows the user, besides the control of the devices, to visualize both the equipment and the data from installed cameras, which transmit images in real time.

In our work we comment about the results of a survey on remote experimentation, which was carried out considering works published from the year 2000 up to the year 2009, considering only “top-rated” journals (in accordance with a Brazilian standard of classification). According to the authors of the research, notwithstanding the importance of the remotely controlled laboratories as convenient teaching tools to deal with experimentation, they are little known and little used in Brazil, in special for experimental activities in Physics teaching.

Works can be found in the literature discussing the benefits that such educational resource could offer for scientific teaching. We could mention, among others, the following possible contributions of the remotely controlled laboratories: the sharing of them among different institutions; their adaptability for students with special needs; the access from any location; and their use in teacher formation programs at a distance.

As a concrete development of our group, working at the Center InovEE – Innovation Center for Energy Efficiency, located at the Sao Paulo State University (Campus of Guaratinguetá), we will present the conception and development of a prototype of an experiment, intended to address concepts related to electromagnetism in Physics classes.

Keywords: *Electromagnetism, Physical Education, Remote Laboratory, WebLab.*

1. Introduction

In general, research in science education have pointed out that a good teaching of scientific concepts goes through rich and varied teaching situations so that the students can explore their

spontaneous conceptions, raise hypotheses and test them, besides developing a series of attitudinal and procedural skills (Carvalho & Gil-Pérez, 2003; Delizoicov, Angotti, & Pernambuco, 2002).

According to Araujo and Abib (2003), experimentation favors the establishment of a link between the world of objects and the one of concepts, laws and theories, and symbolic languages. For Andrade, Lopes and Carvalho (2009), the Physics teaching laboratory is characterized as a relevant tool in establishing an important link between theory and practice, by providing interaction between the person and the object and of them with scientific knowledge and culture, noting that this interaction should be explicit in experimental practices and not excluded from the process as usually occurs.

However, not always the Physics teacher has at his disposal a laboratory ready, appropriate and able to be used, given the limitations of infrastructure in Brazilian schools. Moreover, it is worth noting that, in Brazil, the teachers are not always methodologically prepared to explore all the features that an experimental activity may offer (Araujo & Abib, 2003; Borges & Gomes, 2005; Coelho, 2008; Ferreira & Villani, 2002).

An alternative that has been offered to overcome the limitations of the lack of laboratory and experimental equipment is the use of remotely controlled laboratories (Alhalabi, 2000; Bencomo, 2004; Bischoof & Rohring, 2001; Monteiro, Monteiro, Germano, & Siever, 2013).

The Remote Laboratory, in general, offers access to equipment, countertops and real laboratory experiments via a computer connected to the Internet. Thus, a user can, through a computer with internet access, perform the experiment in a real way, remotely controlling the actions at a distance: adjusting the equipment and collecting data. This is not a simulation, it is a real experience in which a web server allows the user, besides the control of the devices, to visualize the equipment and the data from installed cameras which transmit images in real time (Cardoso & Takahashi, 2011; Monteiro et al., 2013; Nedic et al., 2003).

According to Silva a Remote Experimentation Laboratory should include some items ranging from aspects of the internal structure of the interface, which are: remote control and monitoring of experiments, basic item for performing the remote experiment; multimedia communication among the users, so that there is interaction and exchange of information among them; one digital notepad that is ease to the user to enter data, files, pictures, etc.; resource management, to decide and manage user access to the available experiment; safety both in the aspect of allowing and denying access to resources to manage possible failures or system upgrades; a number of types of communication such as voice, images and data; appropriate bandwidth to allow communication and access to the server.

Although it presents itself as an option of methodological tool for teaching, the Remote Laboratory is still little used and little known in Brazil, as shown by Cardoso and Takahashi (2011). The work of these authors constitutes a characterization of the state of the art in remote experimentation. In the work they collected and analyzed papers with this theme in national and international journals on Teaching and Education, classified as Qualis A according to the Brazilian model for the classification of scientific journals, between the years 2000 and 2009. The results highlight that researches on remote experimentation are relatively recent, since they depend on the technological advances. From the papers discussed in their work, the most commons are related to the areas of engineering, then of the sciences (natural sciences or articulation of components of Physics, Chemistry and Biology), and they did not find any paper related to the field of Physics in particular.

Different authors (Alhalabi, 2000; Bencomo, 2004; Bischoof & Rohring, 2001; Cardoso & Takahashi, 2011; Monteiro et al., 2013) claim the many contributions that this type of resource can offer:

- They can be shared by different educational institutions and, consequently, by different students and teachers. This flexibility allows a reduction of costs, both in terms of installation and maintenance, and also facilitates the occurrence of rich interactions among users who come from distinct social and cultural backgrounds.
- They are easily adaptable to students with special needs. This feature democratizes the education and contributes to inclusion.
- They are accessible from any location, including the student's own residence, at any time, since they can be accessed and controlled from smartphones, notebooks and tablets. In this sense, the experimental activities can be accessed in the classroom along with the teacher, or in the residence of the student, in libraries, study rooms, finally, also as an extraclass activity.

It is also worth mentioning that, given the significant increase in distance training courses for teachers, the Remote Labs can be very useful in such courses (Monteiro et al., 2013). In this work, we present a prototype we developed for the study of Electromagnetism in Physics classes.

2. Description of proposed experiment: The tangent galvanometer

An important concept discussed in Physics classes for high education students is the magnetic field produced by an electric current. The instrument used to measure the intensity of electric current through an electrical circuit is called a galvanometer.

The tangent galvanometer is different from ordinary galvanometers, typically used in Physics or electricity laboratories. In fact it constitutes a very sensitive tool in which a magnetic needle of a compass interacts with the magnetic field established by an electric current flowing through the wires of a circular coil. In Figure 1, below, we show a model of tangent galvanometer.

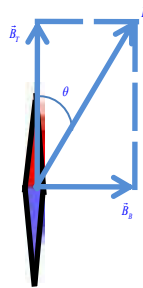
Figure 1. Tangent galvanometer.



While there is no current flowing through the wires of the coil, we will not have the magnetic field it would produce, and thus, the compass needle will align with Earth's magnetic field.

However, when an electric current of intensity I is applied to the coil terminals, besides the Earth's magnetic field B_T , a magnetic field B_B , will act on the compass needle. In this case we can represent the vectors of the magnetic fields acting on the magnetic needle as shown in Figure 2.

Figure 2. Interaction between the magnetic field generated by the coil and the magnetic field of the Earth on the compass needle.

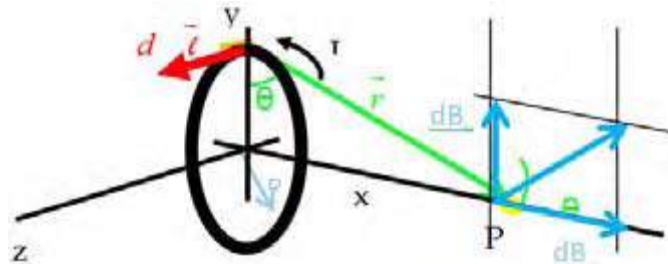


By the definition of the tangent of an angle, we can write the following equation:

$$\operatorname{tg} \theta = \frac{B_B}{B_T} \quad (1)$$

In figure 3, below, we show how the magnetic induction field, produced by a current I that flows through a circular loop, acts along the x axis.

Figure 3. Magnetic induction field, along the x axis, produced by a current I flowing through a circular loop.



According to Young and Freedman (2000), the magnetic induction field produced by a circular coil is given by:

$$B = \frac{\mu_0}{2} I \frac{R^2}{(R^2 + x^2)^{3/2}} \quad (2)$$

Where: R is the radius of the arc; X is the distance from the point to the coil; and μ_0 is the magnetic permeability of the vacuum.

In the particular case of the tangent galvanometer the distance from the point to the coil is zero, since the interaction occurs in the center of the circular coil. Thus, the equation is simplified as follows:

$$B = \frac{\mu_0}{2} \frac{I}{R} \quad (3)$$

Therefore, based on the equations (1) and (3), we can calculate the Earth's magnetic field BT from the following equation (where n is the number of turns of the coil):

$$B = n \frac{\mu_0}{2} \frac{I}{R} \tan \theta \quad (4)$$

3. Automation of the experiment

Once assembled our tangent galvanometer, it was necessary to connect it to a source of electrical current, as well as to an instrument for electric current measurement (ampere-meter), plus, of course, a platform that allowed the control of the electric current source by a user connected to the internet. To do so, as outlined in Monteiro et al. (2013), we used an Arduino Board.

The Arduino board is an open code platform with a microcontroller whose versatility enables more than data acquisition, allowing also to control various devices such as motors and other actuators.

The Arduino programming language is based on C++ and can communicate with other software such as Flash and MaxMSP (Arduino, 2014).

The boards may be assembled manually or adapted from pre-assembled kits according to the user's needs. Next, in Figure 4, we present a picture of the Arduino board used in this project.

Figure 4. Arduino board (<http://www.arduino.cc/>)



Through an Arduino controlled system, the user sends commands via internet and regulates the intensity of the electric current through the coil (Figure 5). Thus, by the aid of an IP camera which transmits images in streams, it is possible to observe the angle of deflection experienced by the magnetic compass needle.

Figure 5. Laboratory experimental.



The user can then replace the observed data in equation (4) and determine the Earth's magnetic field.

4. Conclusion

The tangent galvanometer experiment was automated and allows taking data from a remote access through a computer connected to the internet. In this sense, an experimental activity of Physics, involving abstract concepts as those related to electromagnetism, can be accomplished by a teacher in any classroom, place or time, without major efforts on the part of teachers and students.

Moreover, this activity can also be used in the context of distance learning courses (DLC), especially taking into account the increase of this type of education in recent years in Brazil, particularly in the teacher training process.

While we know that the scientific knowledge is constructed not only from the induction of experimental data, this type of activity is fundamental to the practice of the investigative process inherent to the nature of science. From this point of view, rather than a merely playful, motivating activity, the remote experimentation can and should contribute to the occurrence of a survey and hypothesis testing, discussions about the obtained data, and the construction of explanatory models that justify the observed results.

Therefore, our intent with the development of this experiment is to offer to the teachers a tool to improve the teaching and learning process of Physics in high schools.

References

- Alhalabi, B. (2000). Remote labs: an innovative leap in the world of distance education. Proc. 4th Multi Conf. on Systemic, Cybern and Informatics, and 6th Int. Conference on Information System., Anal. and Synthesis (Orlando, FL) pp 303–307.
- Andrade, J. A N.; Lopes, N. C.; Carvalho, W. L. P. (2009). Uma análise crítica do laboratório didático de física: a experimentação como uma ferramenta para a cultura científica. Encontro Nacional de Pesquisa em Educação em Ciências. Florianópolis.
- Araújo, M. S. T.; Abib, M. L. V. S. (2003). Atividades Experimentais no Ensino de Física: Diferentes Enfoques, Diferentes Finalidades. Revista Brasileira de Ensino de Física, v. 25, n. 2, p. 176-194.
- Arduíno – Homepage. (2014). Retrieved March, 2014, from <http://www.arduino.cc/>.
- Bencomo, S.D. (2004). Control learning: present and future. Annual Reviews in control, 28, 115-136.
- Bischoof, A.; Rohring, C. (2001). Remote experimentation in a collaborative virtual environment. 20th World conference on open learning and distance education. Düsseldorf, Alemanha.
- Borges, A. T.; Gomes, A. D. T. (2005). Percepção de estudantes sobre desenhos de testes experimentais. Caderno Brasileiro de Ensino de Física, Florianópolis, v. 22, n. 1, p. 71-94.
- Cardoso, D. C.; Takahashi, E. K. (2011). Experimentação remota em atividades de ensino formal: um estudo a partir de periódicos Qualis A. Revista Brasileira de Pesquisa em Educação em Ciências, v. 11, n. 3, p. 185-208.
- Carvalho, A. M. P.; Gil-Pérez, D. (2003). Formação de professores de ciências. 7. ed. São Paulo: Cortez.
- Coelho, S. M. et al. (2008). Formação continuada de professores numa visão construtivista: contextos didáticos, estratégias e formas de aprendizagem no ensino experimental de Física. Caderno Brasileiro de Ensino de Física, Florianópolis, v. 25, n. 1, p. 7-34.
- Delizoicov, D.; Angotti, J. A. P.; Pernambuco, M. M. (2002). Ensino de ciências: fundamentos e métodos. São Paulo: Cortez.
- Ferreira, D. B.; Villani, A. (2002). Uma Reflexão Sobre Prática E Ações Na Formação De Professores Para O Ensino De Física. Revista Brasileira de Pesquisa em Educação em Ciências, v. 2, n. 2, p. 63-76.
- Monteiro, M.A.A.; Monteiro, I.C.C.; Germano, J.S.E.; Sievers Junior, F. (2013). Protótipo de uma atividade experimental para o estudo da cinemática realizada remotamente. Caderno Brasileiro de Ensino de Física, v.30, n.1.
- Nedic, Z. ; Machotkd, et. al. (2003). Remote laboratories versus virtual and real laboratories. 33rd ASEE/IEEE Frontiers in Education Conference. Boulder, Colorado, USA: IEEE.
- Young, H. D. ; Roger Freedman, A. (2000). Física III - Eletromagnetismo. 12ª Edição. Ed. Pearson.

TEACHING AND LEARNING NATURAL SCIENCES WITH IBSE METHODOLOGY: A STUDY OUTSIDE CLASSROOM

Ana Cristina Tavares¹, Ilídia Cabral² & José Matias Alves²

¹*Dep. of Projects and Activities, University of Coimbra, Centre of Pharmaceutical Studies (Portugal)*

²*Faculty of Education and Psychology of the Catholic University of Portugal, Centre for Studies in Human Development (Portugal)*

Abstract

Inquiry Based Science Education (IBSE) was recognized as an advantageous method in professional updating and improvement for teachers and educators, through a training course on Natural Sciences educational practices outdoors, part of the Educative Program performed in University of Coimbra Botanic Garden¹. IBSE lesson plans on plants main groups and their evolution were now applied to two samples of pupils from the 3rd and 5th grade of the basic level of education, with 81 and 89 cases, respectively, having been performed in an outside classroom environment, with direct contact with plants. The aim of this study is to directly contact, listen and question the students involved in the program, in order to understand the impacts of this methodology on Natural Sciences learning, using pre and post questionnaires as assessment tools, completed by students before and after the sessions, respectively. In addition to good indicators of evolution and enrichment of the knowledge and the skills of the students, their attitudes and final ideas and proposals revealed motivation and interest to increase the resources of the activity to extend its scope as well as their knowledge.

Keywords: IBSE, experimental methodologies, active learning, Natural Sciences, outdoors spaces.

1. Introduction

Natural Sciences teaching-learning outside the classroom was promoted by developing a training course for teachers and educators in non-formal school contexts, such as Botanic Gardens, Museums or Science Centres settings, indorsed through Inquire educative European Project (2010-2013) (Regan, E. & Dilon, J., 2013). The course Inquire (Bromley et al., 2013) spread Inquiry Based Science Education (IBSE), a facilitator student-centered methodology of knowledge acquisition and building by research, demonstrating change of educational practices, essentially focused on the accumulation of static knowledge, to active teaching-learning of Science. Advantage of IBSE method outdoors in professional updating and improvement of educational practices has been proved (Regan, E. & Dilon, J., 2013; Tavares et al., 2014; Tavares et al. 2015), being now crucial to directly contact, listen and question the actors at schools, teachers and students, to understand the impacts of this methodology on Natural Sciences learning of the students. The educational IBSE testing materials are part of the Educative Program established for 16 years in University of Coimbra Botanic Garden, and formatted for 4 to 14 years old students, crossing the school curricula of Biology, Geography and Geology on relevant and current issues of biodiversity, climate change and sustainability (Bromley et al., 2013; Tavares, 2011). Lesson plans and teaching materials are used in different outside classroom spaces, being applied by graduates on IBSE, the interlocutors of students when visiting Natural Science outdoors locations, as the school gardens, parks, Botanic Gardens or Science Centres.

The proposed activity to be tested, untitled “The alga who wanted to be a flower”, is an IBSE simple approach to the main groups of plants diversity and their evolution (Tavares, 2014). Framed in the current program of education on natural sciences, biodiversity and sustainability to preschool children until the 9th grade students (ages 4-14), this activity is now performed to assess knowledge acquisition

¹The Educative Program of Coimbra Botanic Garden (Tavares, 2011) contains more than thirty educational activities, especially dedicated to Schools, crossing the programmatic curricula of all grades. The actions are presented through an overview, objectives, target audience, topics and curriculum connections and skills to develop. In a final annex presents the teaching materials, content and produced resources such as materials, lesson plans, guides for educator / teacher and the student.

and the social and attitudinal expressions of 3rd and 5th grade of basic school level students, applying IBSE methodology outside the classroom.

2. Methodological design and tools

Sessions of the IBSE Education Science activity were performed with 170 students, being 81 from the 3rd grade (7-8 years old) and 89 students from the 5th grade (9-10 years old) studying in schools in the central region of Portugal. With an outside classroom scenario and based on the story “The alga who wanted to be a flower” (Tavares, 2013), a film, and a song, the students learned and applied new knowledge by directly contacting and identifying plants, and through microscopic observations, drawings and writing activities.. The evaluation of students’ knowledge on the topic in focus (the major groups of plants, living beings and their evolution) was made by means of the application of questionnaires to the children at the beginning and at the end of each session. The pre-questionnaire has five open-ended questions, that aim to assess knowledge, classifying students’ answers as C=correct; I= Incorrect, no answer, not know; PC= partially correct. The post-questionnaire has ten questions. The first four aim to assess students’ knowledge, being identical to the pre-questionnaire questions. The remaining six questions aim to collect data on the opinions, attitudes, reactions, ideas and proposals from students. The analysis of the content of all the five pre questions and the ten post questions of the questionnaires was performed and the type of responses were grouped and evaluated accordingly. The same assessment tools were applied in both 3rd and 5th grade samples, identical in number of valid cases: 81 pairs (pre- and post-questionnaires) of the 3rd grade of basic education; 89 pairs (pre- and post-questionnaires) of the 5th grade of basic education, to be designated simply as 3rd grade and 5th grade sample, respectively.

3. Results

3.1. Pre-questionnaires - Assessment of knowledge and students’ attitudes and opinions

Five open-ended questions to evaluate knowledge, classifying students’ answers as C=correct; I= Incorrect, no answer, not know; PC= partially correct, and the type of answers were assessed. Before the educational activity, children already have the idea that algae, mosses, ferns, plants with cones or flowers are all plants: 82% and 73% of correct answers for 3rd and 5th grade students, respectively. However, within a second level of demand, only 4% (3rd grade) and 10% (5th grade) recognize that all the elements of the previous group, the plants, are living beings. 100% of the children of the 3rd grade and 97% of 5th grade children were not able to identify or distinguish different groups of plants. In what concerns to the existence of a relationship between these groups, 72% of 3rd grade children and 66% of 5th grade children do not know this relationship and the remaining students do not respond correctly.

3.2. Post-questionnaires - Assessment of knowledge

From the applied ten post questionnaires questions, only the more relevant percentages and type of answers will be presented as table. In the 3rd grade, 59% of students give partially correct answers (Table 1) and 6% of students respond correctly (Table 1), learning that there are five groups of plants and identify them as living beings; in grade 5th, 74% of children answer correctly (Table 2) with 43% describing “Algae, moss, fern, plants with cone plants and flowering plants are 5 groups of plants, that are living beings like us” (Table 3).

Table 1. Post questionnaire-2ndQ: correct, incorrect and partially correct answers (3rd grade)

Post questionnaire-2 nd Q: correct, incorrect and partially correct answers (3 rd grade)	Nº	%
PC	48	59.3
I	28	34.6
C	5	6.2
Total	81	100

Table 2. Post questionnaire-2ndQ: correct, incorrect and partially correct answers (5th grade)

Post questionnaire-2 nd Q: correct, incorrect and partially correct answers (5 th grade)	Nº	%
C	66	74.2
PC	17	19.1
I	4	4.5
NR/NS	2	2.2
Total	89	100

Table 3. Post questionnaire-2ndQ: type of answers (5th grade)

Post questionnaire-2 nd Q: type of answers (5 th grade)	Nº	%
Null	2	2.2
5groups / plants / living beings	28	31.5
Algae, moss, fern, pine cone plants and flowering plants / 5 / plants / living beings	38	42.7
Algae / plants / living beings	3	3.4
Confusion among flowers, plants and animals / evolution	3	3.4
There are several groups of plants	15	16.9
Total	89	100

About 35% of the 5th grade students identifies all groups as plants based on the morphological characteristics as “Presence of flower and fruit and pine cone / flower, seed, leaf / flower seed fruit / leaves and seeds found”; only 1% of the 3rd grade students could indicate that “Among the groups, same, have a seed, some not”.

Table 4. Post questionnaire-4th Q: type of answers (5th grade)

Post questionnaire-4 th Q: type of answers (5 th grade)	Nº	%
Null	18	20.2
First appear the algae, then the moss, the fern, the plants with cone and then with flowers	31	34.8
Evolution of plants begin with the algae	6	6.7
Evolution is great and funny	6	6.7
There are several types of plants in evolution	4	4.5
Very important, brutal, interesting	8	9
In one hand we have the evolution, five fingers five corresponding to five plants groups	8	9
Evolution period is a very time consuming period	8	9
Total	89	100

Concerning the evolution of the 5 main groups of plants, 10% of 3rd grade students say that “First appear the algae, then the moss, the fern, the plants with cone and then with flowers” and the 35% of 5th grade student’s totally success in this plants chronology (Table 4).

3.3. Overall assessment and student’s attitudes and opinions

The educative activity was appreciated by the great majority of the students of 3rd and 5th grade, that feel willing to adopt some new attitudes on nature and plants awareness and that made different suggestions to improve the activity (Table 5). After this educative experience the great majority of the two grades students could expressed a positive appreciation of the activity and also considered to feel more inspired to learn more about the natural world.

Table 5. Post questionnaire-5th to 10th Q: type of answers (3rd and 5th grade)

Post questionnaire-5 th to 10 th Q type of answers (3 rd and 5 th grade): Type of answers		
Student’s attitudes and opinions topics	3 rd grade (%)	5 th grade (%)
Positive general appreciation of the activity	86	93
Proposing more activities / more stories/ internet programs	16	20
Willing to study how plants evolved	6	77
Be able to talk to a friend about different groups of plants in a garden	47	73
Be able to show ideas about the evolution of plants in a debate or discussion	35	43
Feel more inspired to learn more about the natural world	79	86
Feel closer to nature and think about what may affect it	12	31
Willing to sign up a nature or science club (3 rd grade)/ Read more books/magazines on the natural world (5 th grade)	10	20
Willing to visit a museum, botanical garden, zoo or park	7	31

4. Discussion and Conclusions

Without comparisons on the application of other teaching-learning methods, the evidence from this activity on “The alga who wanted to be a flower” indicate that some effectiveness was achieved with the educational IBSE methodology used in the learning process of the 3rd and the 5th grade students of basic schools, about the five different groups of plants and their evolution, while living beings, like us humans, as new knowledge was partially achieved by the students. As revealed by the assessed pre and post questionnaires, the level of knowledge of the students before the action on the distinction of plant

groups, recognizing plants as living beings and their evolution was very low and similar in both groups, 3rd grade and 5th grade, respectively, although the majority have already the idea that algae, mosses, ferns, plants with cones or flowers all belong to the plants' group.

The construction of new knowledge was reflected by less than a half of 5th grade children identifying the five groups of plants as living beings and answering correctly describing "Algae, moss, fern, plants with cone plants and flowering plants as the 5 groups of plants, that are living beings like us" and only a fewer part of the 3rd grade children; on plants evolution some 3rd grade students learned this path for plants and more 5th grade students totally successes this chronology.

As the same questionnaires (pre- and post-activity) were apply to 3rd to the 5th grade students, it allows to compare the knowledge and opinions of students relatively to the same questions, regardless of the students' age or the curriculum level in question. Not surprisingly, the results reveal a general advantageous on the learning performance and skills of the 5th grade students comparing to the 3rd grade younger ones, which yet fulfilling the main objectives, what brings the perspective to say that new concepts are possible to be learn whatever age. Students knew that the questions were the same for different level age till 9th grade, as this notification was made when students have doubts in completing the questionnaires, taking the opportunity to explain the lack of response may be an answer, and sometimes there can be no single answer to the same question, which depends on the knowledge and realities of each student and each school. The students themselves realize that their knowledge and skills evolve, as well as the path of life and the path of the five main plants groups they learned. What they do not know or are not able today can learn or do tomorrow.

Besides new knowledge acquisition, the attitudes and opinions of both the 3rd and 5th grade of students also revealed new interests and awareness on plants, globally. As this action is planned to be applied to students up to the 9th grade, the level of demand for the correction was made to this level of education, the one that evaluates this sample, composed of 3rd and 5th grade students, what can probably explain that there had been not a large number of correct responses on the post-questionnaires. Pondering all the factors and evidences, on a general overview, we may consider that the main objectives on this Natural Sciences IBSE activity for learning seem to have been achieved. Some evolution and enrichment of students' knowledge, skills and attitudes were attained, specially reflected on their ideas and proposals to further resources to be use, being willing to extend the activity scope as well as their knowledge background possibilities.

References

- Bromley, G., Regan, E., Kapelari, S., Dillon, J., Vergou, A., Willison, J. Bonomi, C., Paiva, I., Santos, J. & Tavares, A.C. (2013) *O manual do curso Inquire, Projeto INQUIRE*, 2013, Coimbra, Portugal. Coimbra Inquire manual Course for teachers and educators. Coimbra: FCTUC.
- Regan, E. & Dilon, J. (2013) *Quality management Report: Inquire – Inquiry-Based Teacher training for a Sustainable Future*. London: BGCI.
- Tavares, A.C. (2011) *Um programa educativo sustentável: Jardim Botânico da Universidade de Coimbra (1997-2010)*. Monografia do Jardim Botânico de Coimbra. Departamento das Ciências da Vida/Jardim Botânico /FCTUC. 2011. A Sustainable Educative Program in COIBG. Coimbra: FCTUC.
- Tavares, A.C. (2013) *A alga que queria ser flor/The algae who wanted to be a flower*. Coimbra: Imprensa da Universidade de Coimbra.
- Tavares, A.C. (2014) *The Alga Who Wanted To Be a Flower – An outdoors IBSE Model on Plants Evolution*. In Hands-on Science. Science Education with and for Society. Costa MFM, Pombo P, Dorrió BV (Eds.), Pgs. 19-28. Aveiro: Hands-on Science Network.
- Tavares, A.C., Silva, S. & Bettencourt, T. (2015) Advantages of Science Education Outdoors through IBSE methodology, in *Inquiry-Based Learning for Science, Technology, Engineering, and Math (STEM) Programs: A Conceptual and Practical Resource for Educators*, Vol. 4, Emerald Group Publishing, pp. (ACCEPTED for publication).
- Tavares, A. C., Silva, S., Santos, J., Paiva I., Oliveira J. & Bettencourt, T. (2014) Inquire at Coimbra Botanic Garden: Products and Process of an IBSE Educative Project. 5th World Conference on Educational Sciences (WCES 2013). *Procedia-Social and Behavioral Sciences*, 116: 4353-4356.

THE PATTERN OF THE INTERNAL GOVERNANCE OF PRIVATE UNIVERSITIES IN CHINA

Xu Liu

*Sichuan Normal University (China)
Institute of Education, University College London (UK)*

Abstract

The purpose of the present study is to explore whether and how private universities in China fulfil the expectations of the state and their other stakeholders, through an inquiry into their governance practices. It employs the multiple comparative cases study with 25 interviewees who are presidents, chair persons and members of council, experts and officers of the government in private university in China. In order to collaborate and corroborate the interview data, documentary analysis was used as well. This paper presents some findings from this study.

Keywords: *Private universities, stakeholders, cases study, findings*

1. Introduction

In China universities in the private section have grown in proportion to the wider Higher Education sector to a remarkable degree over the past fifteen year. A recent Ministry of Education (Ministry of Education, 2014) report states that now 30 percent of students in the HE sector are private universities. In especial, the number of students in private university who pursuit the associate degree or bachelor degree with full-time are 5.57 million in 718 private universities. This is all the more remarkable when one recognizes that the beginning of the private sector was only in 2001 with 2.9 percent of the total student numbers. Owing to China's relatively short history of private universities and a low status in rankings, the majority private universities tend to admit students who have not achieved high grades in the high school, and the purpose of most private universities is geared towards vocational higher education.

While the growth of private universities has been notable in recent years, the idea of the private university dates back to the late Qing Dynasty period.¹ There are two groups in the early private universities which were run by the Chinese and foreign agencies respectively. These private universities were eventually eradicated through the legal instrument called the 'Adjustment of College and Faculty' in 1952, in which the system of HE was transformed to what was then described as being the 'Soviet Model'. All of the 69 existing private universities then became state universities. The present study is concerned with developments that took place after the new era initiated under the leadership of Deng Xiaoping which is often referred to as the Reform and Open Policy inaugurated in 1979 (Zhong and Zhao etc., 2010).

With the rapid development, the private universities currently are confronted with a different set of challenges. In the past five years the budget for state universities has increased, and almost doubled in some provinces. This increasing budget have great improved the condition of state university, in contrast, the private university has no designed fund from government. The public has a great demand for higher education, but they are seeking not only greater opportunities but higher quality. In addition, the transformation and upgrade of economical structure and development of China also bring a higher and new requirement to the cultivation of talents of private university. More than that, accompanying the expansion of the sector during this period has occurred the twin influences of internationalization and globalization. An expression of this position has been the growth in numbers of Chinese students leaving to study abroad, a trend which has been great developing particularly in the past ten years. With increased internationalization of higher education and of global mobility, private universities find themselves in a new landscape of potential challenge and risk.

¹The Qing Empire (1644–1912) was the last dynastic empire to rule China.

2. Research Questions

The purpose of the present study is to explore whether and how private universities in China fulfill the expectations of the state and their other stakeholders, through an inquiry into their governance practices. By governance is meant the national legal and regulatory framework together with the implementation of that framework at institutional level. In view of this broad context this research sets out to examine two inter-related questions.

Is the governance framework fully implemented in the private institutions, and what are the issues and problems that arise in implementation? What are the consequences of implementation/non-implementation, in the broader context of the university and its responsibilities? This question will investigate:

- how the aspirations of stakeholders are expressed and addressed
- executive leadership, in relation to governance
- the role of the Council and Senate
- the role of CPC officials and CPC committees.

While recognizing that governance is only one of the elements involved in a well performed university, what changes in the governance framework and/or its implementation would allow the private institutions to more adequately fulfill (a) state policies and requirements, and (b) the needs of internal and external stakeholders?

3. Theories and its role in this study

According to the Education Law of China (National People' Congress, 1995), an education institution automatically obtains the status of a legal person when it registers with the government authority. In the Law of the PRC on Promotion of the Private School, the private university is 'institution which can award the diploma of full-time higher education or above degree, and is initiated by non-state financing'. Furthermore, the private university sets up Council or other forms of decision-making bodies and the President is responsible for the daily running of the university (National People's Congress, 2002). Based on above, this study uses three theories in the theoretical explanatory section which are Agency theory, Stewardship theory and Stakeholders theory. These theories are used to explore the governance behaviours in the internal governance of the university. They are also adopted in the data analysis, as this research explores the ideas used by the interviewees to practically guide their actions. Afterwards, it illustrates how these theories are related, how they make sense of the data and if these theories are appropriate to explain the governance actions of Chinese private universities. Based on, but not limited to, the roles of these theories, the researcher expects to develop the theory in the empirical reality of a Chinese context.

4. Research methods

In China there are 23 provinces, four municipalities directly under the central government, five ethnic minority autonomous regions and two special administrative regions, with a distinct variation in the developmental level between these in economic and social terms. Currently, the external governance bodies of private universities are the Ministry of Education and Provincial Education Department. Provincial government has discretion in policy; as a consequence different provinces have different policies on private higher education. This research have chosen one province as a single holistic case to study three different governance type private universities which are combined council with senate governance, separated council with senate governance and family-governance.

The multiple comparative cases study explores the differences and similarities within and between cases (Baxter and Jack, 2008; Yin, 2009). It offers an in-depth understanding of different cases and accounts for the complexity of the cases with some generalizations and connections across cases (Ragin, 1989). And it displays some common attributions and unique features by establishing a direct connection with each case (Baxter and Jack, 2008). The multiple comparative cases study was used in this study and the comparative is carried out from two different dimensions. The first dimension is comparing the governmental regulations with the practice of each case university. The second dimension is comparing the similarities and differences on internal governance within and between the cases. Afterwards, it explores how these governance structures and characteristics of the cases support the universities to achieve their mission, as awarded by their stakeholders. The study finally carried out 25 interviewees with president, chair persons and members of council, experts and officers of the government in private university in China, which produced a field work transcription with 200,000 words.

Bailey (2007) pointed out that to employ different forms of data collection can ensure the quality of qualitative research. In order to collaborate and corroborate the interview data, documentary analysis was employed in this study. Documents are a rich source of qualitative data as they give the origins and meanings of the information being discussed (Mason, 2002; Prior, 2004; Atkinson and Coffey, 2004). As a primary data collection method, it asks us to think what can be learnt from the documents and generates or filters data pertaining to the research questions (Gibson and Brown, 2009). The documents are collected in either hardcopy or electronic formats from the websites, publications and the interviewees which include laws, policies and regulations. It provides a chronology of the governance actions of government, universities and their interactions.

5. Interview extracts from the field work

The first extract is about the relation between the shareholder and the president:

“The property belongs to shareholders who worry about the President recklessly spending money without being hard working. As a consequence the shareholders hold important positions in the university or appoint their relatives to work in the university. The solution is designing a mechanism to improve the trust between the shareholder (Chair) and the President” (Interview with a President of private university on 21 July 2014).

This interviewee thinks the trust between the shareholders and the president is lacking and there should be a formal mechanism to make explicit different responsibilities and rights. This opinion can be explained from the perspective of the Principal-agency theory which regards that the interests between the principals and the managers, as agents of the principle, are different, even in conflict with each other. In Principal-Agency theory, in order to address this conflict, a formal contractual relation should be established between the principal and the managers. However, there is another opinion:

“I have worked here for many years and have not had any share of this university. However, I have a deep feeling towards even just the trees and bushes here, which is the reason I am working so hard. Sometimes I take more pressure than the Chair on the development of university and my friends said I am silly. Maybe it is being faithful to education and whatever we do we should always try to be the best rather than just think about money” (Interview with an Executive President on 25 July 2014).

The interviewee here has participated in the establishment and development of the university. He has contributed more than 15 years to this university and he is willing to commit fully to this university. Also, he thinks education has a great mission and he should be loyal to not just to this university but also to this noble cause. This interview reflects the opinion of the Stewardship Theory, which states that the senior manager gains intrinsic satisfaction by addressing their responsibilities and experiencing challenges at work. It argues that the shareholder should trust their agents, their managers, and create good working conditions for them.

In this interview, the private university is subordinate to the government, which has absolute authority on the private university. Moreover, another interviewee says:

“The population number of Sichuan is almost 90 million. Local governmental department needs more discretion in policy making and implementation. The law of private education is “Promotion Law” which means the responsibility of the government is providing support and guidance to promote the development of the universities. It asks the government to establish the institutional system to implement existing policy and deliver more power to the local government” (Interview with the Chief of Private Education Office of Education Department of Sichuan in 15 September 2014).

This interviewee argues that the central government should transfer more discretion in policy making and implementation to the local provincial government because of different development levels in different provinces where most have very large populations.

6. Some documents used as data

- 1999 The Law of Higher Education Presidential Decree
- 2003 The Law of the PRC on Promotion of the Private School National People’s Congress
- 2003 Opinions on Standardizing Independent College Sponsored with New Mechanisms and Models from State Universities Ministry of Education
- 2004 The Interpretative Regulations on the Promotion Law State Council Decree

- 2006 The opinions of energetically carrying out the development of private higher education Sichuan Education Department, Finance Department and other 10 local departments
- 2006 Announcement on Strengthening Management and Guiding Healthy development of Private University State Council
- 2007 Some Regulation on running management of the private university Ministry of education
- 2012 The middle and long-term planning of Higher education Ministry of education
- 2013 Several opinions on further promoting the development of private education Ministry of education

7. Coding process

In the analysis, themes are set by considering the data, which are important to the description of a phenomenon and are associated to a specific research question (Daly and Kellehear, 1997). In addition, thematic analysis is the most common form of analysis in qualitative research, in which themes go beyond the words of a text and moves on to identifying implicit and explicit ideas about the data (Guest, 2012). In this study, the thematic analysis is applied to data analysis. During the process of the analysis, the quality analysis software Nvivo is used. Based on the literature of research questions, I have a rough framework on the potential data themes. Firstly, according to different positions of the interviewees in the private higher education field all interview transcripts are classified to five types. They are interviews from Case A, interviews from Case B, interviews from Case C, interviews from experts and interviews from officials. Furthermore, the transcript content of each type is divided into two parts: opinions on the governance of case universities and opinions on governance problems on private universities. After that, thematic analysis is applied with two different classifications in the interview data analysis. The same method of thematic analysis is used in 26 governmental documents and the analysis of document with different codes which provide a chronological requirement of the government to the internal governance of private university. Finally, 17 themes which are related with research question produced after the combination and classification with different codes.

8. Findings

Chinese private university originates from the popularization of higher education in the beginning of 21 century. In that time the state universities were saturated to hardly offer enough places and the fiscal budget of higher education was shortage. The private universities absorbed a big amount of private capital into higher education which greatly relieved the financial pressure of the government. It also has trained a large of number graduates who have practical skill to meet the development requirement of the economy and society in China.

With the development of private university, there are many typical phenomenon regarding the function and composition of the governing body and senior manager team in the private university. For example, there is no independent governing body in the university, which combines with the senior manager team, and the shareholders work as a President or higher position in the university; or there is no formal President in the university where the power of the President resides in the Chair of the governing body who are the shareholder of university.

According to this research, these above phenomena can be reasonable explained by the for-profit attribution of the private capital in the Chinese social and economic context. Other than that, the high centralized structure in the internal governance practically improves the operated efficiency in initial stage of private university. However, this high centralized is not appropriate when then the universities achieve the initial construction and turn into connotative development. It needs more professional educational teams and concentrates more intelligence rather than limited in the shareholders. In fact, many shareholders gradually realize this problem and try to adjust the internal governance structure of the university. Based on this research, the direct stakeholders of the private university are shareholders, staff, students, parents, the local community, the local government, the central government, employers of graduates. These different stakeholders constitute an interests community in which there interests are closely connect with each other. The interests of these stakeholders look like different but these interests could be achieved by the qualified education of the university. There are also four suggestions based on this research.

- University Constitution and Status is an important measure to improve the internal governance and mission achieving of private university. All private universities are currently required to frame their Constitutions. After this, the next assignment should be establishing mechanism of assurance to

improve the implementation of the Constitution. The executive effect will be greatly influenced by the university running purpose of the sponsors that is shareholders of the university.

- The qualified senior manager of the private university is shortage and organized training program to these senior managers is few. However, qualified senior manager team does not only improve the development of the private university but also improve the shareholder to leave alone the daily running of the university to the professional qualified team. It is urgent that a series of sustainable training program initiated by the government or awarded organization.
- The provincial government needs to have more discretion on making educational policy since a big distance in economics and educational level between different regions.
- Compared with state university, private university has many bored advantage such as more flexible efficient mechanism and autonomy. It has potentials to become a powerful competitor of state university and consequently become an important power in reform of higher education in China even though it needs to take some years.

Acknowledgement

This study is supported by a research grant from The National Planning Office of Philosophy and Social Science in China. The name of project is Corporate Governance Structure of Private University in China; the number of project: CIA140189.

References

- Atkinson, P and Coffey, A., (2004), Analyzing documentary realities, *Qualitative Research*, pp 56-75.
- Baxter, P., and Jack, S., (2008), Qualitative case study methodology: Study design and implementation for novice researchers. *The qualitative report*, 13(4), pp544-559.
- Daly, J. and Kellehear, A., (1997), *The public health researcher: A methodological approach*. Melbourne: Oxford University Press.
- Gibson, W. and Brown, A., (2009), *Working with qualitative data*. London: Sage Publications.
- Guest, G., (2012), *Applied thematic analysis*. Sage Publications.
- Mason, J., (2002), *Qualitative researching*. London: Sage Publications.
- Ministry of Education, (2004), National education statistical bulletin in 2003 (In Chinese). Retrieved 12.21.2014 from: http://www.edu.cn/jiao_yu_fa_zhan_498/20060323/t20060323_95235.shtml
- Ministry of Education, (2010), *Opinions on Improving the Development of Private Education* (In Chinese).
- Ministry of Education, (2012), The Regulations of Staff Congress of Schools (In Chinese). Retrieved 10.28.2014 from: http://www.gov.cn/flfg/2012-01/09/content_2040254.htm
- National People Congress, (1995), *Education Law of the People's Republic of China*. (In Chinese). Retrieved 01.07.2015 from http://www.moe.edu.cn/publicfiles/business/htmlfiles/moe/moe_619/200407/1316.html
- National People's Congress, (2002), *Law of the PRC on Promotion of the Private School* (In Chinese). Retrieved 12.02.2014 from: http://www.moe.edu.cn/publicfiles/business/htmlfiles/moe/moe_619/200407/1317.html
- Prior, L., (2004), Doing things with documents. In David Silverman *Qualitative research: Theory, method and practice* (Edition 2). London: Sage publications.
- Ragin, C. C., (1989), *The comparative method: Moving beyond qualitative and quantitative strategies*. University of California Press.
- Yin, R. K., (2009), *Case study research: Design and methods*. London: Sage Publications.
- Zhong, B. L. and Zhao, Y.S etc., (2010), *To seize the historical opportunity and resolve the deep contradiction in order to promote the healthy development-the analysis of reform and development of the private higher education in China* (In Chinese). Chinese Higher Education, Iss.23, pp11-14.

Workshops



CHILDREN AT RISK FOR MENTAL DISORDERS AND THE IMPACT OF TEACHERS ON CHILD MENTAL HEALTH PROMOTION

Paulo Pinheiro¹, Agar Almeida², Orkan Okan¹, Dirk Bruland¹, Anabela Pereira²,
Luis Saboga Nunes³, Ester Lopes^{1,4} & Ullrich Bauer¹

¹Faculty of Educational Science, Bielefeld University (Germany)

²Department of Education, University of Aveiro (Portugal)

³National School of Public Health, New University of Lisbon (Portugal)

⁴Research Centre on Child Studies CIEC, University of Minho (Portugal)

Abstract

Purpose: The workshop aims to highlight the potential contribution of teachers to promote child mental health in schools. We will figure out the current practices in schools by questioning how professionals deal with children at risk for mental disorders. The diagnostic perspective will be complemented with an outline of strategies to promote child mental health in schools. **Background:** Up to one in five children and teens suffer from mental health problems, and the number is growing making mental disorders by 2020 one of the five leading causes of childhood illness, disability and death. Psychosocial and socio-structural strains significantly contribute to the emergence of mental disorders what, in turn, offers opportunities to target children at risk with primary preventive and health promoting measures. The different burden patterns and attempts at coping often become manifest in children's school lives. While some children react with withdrawal and drop in achievement, others become aggressive or display behavioural problems. The coping strategies expose the children to a higher risk of experiencing a "school handicap" and being excluded from regular schools once a special need of support has been diagnosed. It is obvious that such loading factors increase the probability of having a problematic educational biography. We will discuss the opportunities and strategies for child health promotion in the school setting. The discussions will be exemplified with three teacher training programmes (addressing health promotion of children of mentally-ill parents, suicide prevention, and prevention of sexual abuse in primary schools). **Key points:** (a) Outline of the concept of mental health literacy. (b) Awareness rising of the impact of schools and educational professionals on child mental health promotion. (c) Recommendations for actions in teacher training and school development to promote child mental health. **Description of the participants:** The intended audience covers all people professionally involved in school teaching and development (e.g. teachers, health educators, health professionals, decision- and policymakers). The maximum number of participants is 40.

Keywords: School health promotion, mental health disorders, mental health literacy, child health promotion, primary prevention.

1. Purpose

One very important setting for the promotion of a young person's mental health and well-being is the school. Mental health can be prerequisite as well as outcome of school life and learning. There is, however, need for clarifying the characteristics of systems and programmes to promote mental health and well-being and to build resilience in both staff and students to help prepare them to cope with a range of life events. The involvement of outside agencies and mental health professionals has also to be addressed when it is aimed to implement a continuum of support that focuses on the needs of all students including those with special educational needs. Moreover with the financial downgrade of certain southern economies in Europe, children are highly exposed to these critical conditions. Societies have a hard time to cope and implement buffer strategies to help children cope with parent's longer hours of work, changes in schools structures (e.g. fewer teachers, higher numbers of students/per class).

The workshop aims to highlight the potential contribution of teachers to promote child mental health in schools. We will figure out current practices in schools by questioning how professionals deal with children at risk for mental disorders. This "diagnostic" perspective will be complemented with an outline of strategies to promote child mental health in schools. This will be exemplified by three teacher training programmes. The programmes will then be discussed and contrasted with the participants' perspectives in order to outline recommendations for future work.

2. Background

2.1. Children at risk for mental disorders

Mental and behavioural disorders increasingly impact on population health worldwide and are among the leading conditions that contribute across all cultures to the overall burden of disease [Murray et al. 2012]. Data on the burden of mental disorders has recently also become available for young people [e.g. Hölling et al. 2008] and shows that up to one in five children and teens suffer from mental health problems. The trends are increasing making mental disorders by 2020 one of the five leading causes of childhood illness, disability and death. The mechanisms of the trans-generational transmission of mental disorders are currently best explained with diathesis–stress models suggesting that all people have some level of predispositional vulnerability towards certain mental disorders [Ingram & Luxton, 2005]. The transmission and onset of a mental disorder result then from interactions between genetic, biological, psychological and social risk factors [e.g. England & Sim 2009; Hammen et al 2012].

The severity and impact of psychological and social stress factors on children at risk show high variability and result from the burdens that the children are faced with in everyday living. Disorientation, feelings of guilt, taboo, stigmatization, isolation, care deficits and additional burdens such as taking care of household chores are particularly prevalent. In addition, children also may assume parental tasks of providing care (parentification) and are urged into inverted role relationships when e.g. the parents are affected by mental disorders in assuming the parenting roles. Parent–child interactions, parenting styles and adverse life events are key triggers for the transmission of mental disorders from the parents to the offspring. Interestingly, many children and families who are at increased risk (e.g. children of mentally-ill parents) cope well with these problems [Hammen 1991]. Children of e.g. depressed parents coped well when they had individual, family and community resources to accomplish developmental tasks, engage in relationships, and understand their and their family's situation [Beardslee & Podorefsky 1988].

2.2. Schools, teachers, and child mental health promotion

The different burden patterns and attempts at coping with mental health stressors also become manifest in children's school lives. While some children react with withdrawal and a drop in achievement, others become aggressive or display behavioural problems. Lack of sleep, poor concentration, learning lags, and absence from school may impair their school life and academic achievements. Family arrangements that are appraised as a deviating from typical family norms may cause social isolation, anxiety, and shame. Developmental problems that already emerge in childhood are also particular sources of school-related problems [Griepentstroh & Schmuhl, 2010]. This specific risk dimension resulting from e.g. a parental mental disorder includes a higher risk of experiencing a "school handicap", and results in being excluded from regular schools once a special need of support is observed [Powell 2007]. It is evident that these loading factors increase the probability of having a problematic educational biography.

Schools can therefore have an important protective function, but can also create risk potentials. In the school setting, however, there is often an at best informal awareness of mental health problems: teachers are usually not trained and equipped with skills to adequately respond to particularly burdened life situations, yet. They are rarely skilled to decode such phenomena as symptoms of a special risk situation and seldom dispose of the means to provide adequate individual support [Wagner et al. 2009]. It is evident that such a practice of support is insufficient for children in special life situations. To address the mental health literacy of teachers in order to foster the primary preventive and health promoting potentials of children is an unusual but innovative and promising approach. To target the adults' mental health literacy with respect to issues of child mental health is novel in the debate on school health promotion and can help to fill important gaps.

2.3. Strategies exemplified by three teacher training programmes

The analysis of the role and the impact of teachers and schools on child mental health promotion will be exemplified by the following three teacher training programmes: *Promoting the teacher's mental health literacy to promote the health of children of mentally ill parents*: Children of mentally-ill parents are a population at high risk for the development of mental disorders (about a quarter of the students in Germany). Mental health literacy encompasses according to Jorm [Jorm 2000] the knowledge and beliefs about mental disorders which aid their recognition, management or prevention. By use of this framework, a six-hour teacher training programme was developed to meet three major objectives: Awareness rising, increasing knowledge, and promoting of the teachers' and educators' capacity to act. Teaching materials were produced by a multidisciplinary team and a range of didactic methods were used to design a total of three teaching sessions. The programme is evaluated at the end by the participants. *Mental health promotion and suicide prevention: Teacher training in MOOC environment*: Mental health promotion and prevention of suicidal behaviours in the context of schools is an issue with still scarce scientific data.

This translates into a lack of evaluated teacher training programs in mental health promotion and suicide prevention. This Portuguese project aims, therefore, to develop, implement and evaluate a training program for teachers from preschool to high school in MOOC (Massive Open Online Courses) environment in order to increase the teacher's literacy about the mental health of their students. It is anticipated that there will be need for structures and integrated projects that favour the students' monitoring throughout their school career, greater knowledge and personal/social skills development. A training programme in mental health promotion and suicide prevention offered in MOOC environment is considered to work as an asset in teachers' initial formation. *Primary prevention of sexual abuse in primary schools. The German "Igel" project*: The project resulted in the development, implementation and evaluation of a primary preventive concept in educational settings. The programme consists of two modules addressing (1) the knowledge and capacity to act of the high-risk group of students aged 10-12 years and (2) the awareness and training of the teaching staff. Results from formative and summative evaluation highlight low-threshold implementation and effectiveness of the programme.

3. Key points

The paper of schools and teachers in dealing with health-related and health promoting issues is poorly outlined and there is need for approaches that benefit the professionals and finally the students. Teachers are usually not trained in health-related issues but are increasingly exposed to situations where health-related knowledge and options for action are demanded. Such a mismatch can result in insufficient support and use of opportunities for children at risk. It is obvious that teachers are not to assume any clinical tasks from the medical field. Defining the teacher's role in health-related issues can rather take several options into account that will be discussed during the workshop: (a) familiarizing with the diverse living conditions of the children, (b) developing a "culture of taking notice" that facilitates the recognition of children's special needs and particular need for advice, and (c) probably most important knowing as much as possible and making mistakes as few as possible. The last point refers to some problematic aspects such as teachers' feeling too potent to diagnose, disclosure of students at risk, the lack of networking of services, or the inability to act when the teachers want to offer support.

References

- Ingram RE, Luxton DD (2005). Vulnerability-Stress Models. In: Hankin BL, Abela JRZ (eds.) *Development of Psychopathology*. Thousand Oaks, CA: Sage Publications Inc. pp. 32-46
- Murray CJ, Vos T, Lozano R, et al. (2012) Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*. Dec 15;380(9859):2197-223.
- Hölling H, Kurth BM, Rothenberger A, Becker A, Schlack R (2008). Assessing psychopathological problems of children and adolescents from 3 to 17 years in a nationwide representative sample. *Eur Child Adolesc Psychiatry*. Dec;17 Suppl 1:34-41.
- England MJ, Sim LJ. (2009). *Depression in Parents, Parenting, and Children: Opportunities to Improve Identification, Treatment, and Prevention*. Washington, DC: National Academies Press.
- Hammen C, Hazel NA, Brennan PA, Najman J. (2012). Intergenerational transmission and continuity of stress and depression: depressed women and their offspring in 20 years of follow-up. *Psychol Med*. 42(5): 931-42.
- Hammen C. (1991). *Depression runs in families: the social context of risk and resilience in children of depressed mothers*. New York, NY: Springer.
- Beardslee WR, Podorefsky D. (1988). Resilient adolescents whose parents have serious affective and other psychiatric disorders: importance of self-understanding and relationships. *Am J Psychiatry*. 145: 63-69.
- Griepenstroh J, Schmuhl M. (2010). Zur Lebenssituation von Kindern psychisch erkrankter Eltern. Ein Überblick. In: *Psych Pflege*. 16, 123-128. [German]
- Powell JJW. (2007). Behinderung in der Schule, behindert durch Schule? Die Institutionalisierung der ‚schulischen Behinderung‘. In: Waldschmidt A, Schneider W. (eds.): *Disability Studies, Kulturosoziologie und Soziologie der Behinderung*. Bielefeld: transcript Verlag. 321-343. [German]
- Wagner W, Helmke A, Schrader FW. (2009). Die Rekonstruktion der Übergangsempfehlung für die Sekundarstufe I. und der Wahl des Bildungsgangs auf der Basis des Migrationsstatus, der sozialen Herkunft, der Schulleistung und schulklassenspezifischer Merkmale. In: *Zeitschrift für Erziehungswissenschaft* 12/2009. Bildungsentscheidungen. Wiesbaden. VS. 183-204. [German]
- Jorm AF. (2000). Mental Health Literacy. Public knowledge and beliefs about mental disorders. *British Journal of Psychiatry*. 177, 396-401.

PROCESS DRAMA IN A CREATIVE, BRAIN – FRIENDLY LANGUAGE EDUCATION

Prof. dr hab. Alicja Gałązka

Department of Psychology and Education, University of Silesia (Poland)

Abstract

Drama is a method which promotes so called brain based learning . It makes learning a language more effective and “ brain friendly” Students are making sense of the world around them through acting and reacting real and imagined experiences. They are verbalizing in make believe worlds, generating, rehearsing and practising the language required in a safe fictional context. They are also experiencing the emotional thrill of role play “as if”. In drama there is a safe and distanced opportunity to recognize and talk about emotions together developing a target language When a student is playing a character of their own creation within a class drama they are having to consider how to react and act as another person. To do this successfully they will need to draw on what they know and have actually experienced emotionally. They will need to link real and imagined emotional experiences in order to develop a plausible character and use a target language.

The paper will discuss the potential drama gives to make learning creative and brain friendly

Keywords: *Drama, brain, language education,*

1. Drama and the brain based learning

“Brain based” or accelerated learning concept is not particularly new but it generated much interest in recent years. These terms are simply umbrella names that encompass approaches to learning that are compatible with the way the brain operates and learns most effectively. (Hughes, 2001) Summing up the recent research we can emphasize some facts about the brain which are particularly important for the learning. We know that the brain develops best in environments with high levels of sensory stimulation and sustained cognitive challenge. High challenge but low threat stimulates learning and that’s why learning environments must be perceived to be 'safe'. Higher order thinking functions and memory are inhibited by threat. Low self-esteem and lack of self-belief inhibit learning .The brain thrives on immediacy of feedback, on diversity and on choice. When learners engage in what is described as 'pole-bridging', improvements in reasoning powers are dramatic. There is a synergy with left and right hemisphere learning. Whilst there be differences in hemispherical function we now know that this is relative as functions can be compensated for and developed, and that both hemispheres are engaged in simultaneous processing. Expectations shape outcomes and the search for meaning is innate. Once engaged in a learning outcome we cannot stop the brain processing for meaning. Learning takes place at both conscious and unconscious levels. Motivation accelerates once the learner adopts a positive, personal learning goal. Each brain has a high degree of plasticity developing and integrating with experience in ways unique to itself. There may be different types of intelligence and it is modifiable. Only diversity in teaching and learning can begin to this process . Learning and maturation cannot be separated. nor can the physical readiness or 'state' of the learner and learning. The emotions direct conscious attention. One cannot isolate the cognitive from the affective. We must therefore pay attention to physical and emotional 'state' in our learning environments. Music aids learning. The most recent research suggests that music can aid learning in three ways. It can energise or relax - hence altering the individual's 'state' or readiness for learning. It can carry content. It makes the neural networks more receptive for learning. It is also important to remember that there may be different types of memory involving different memory pathways in the brain.

2. Drama and intelligences

Drama is a teaching and learning medium that recognizes, utilizes and develops the full range of Howard Gardner’s multiple intelligences Drama can be used as an effective methodology for the assessment of ‘intelligence’ across a wide range of subjects and areas, drama provides opportunities for individual, group, private and shared reflection and supports the development of reflective intelligence.

Drama is a cognitive and affective vehicle for recognizing and developing emotional intelligence. What we consider intelligence to be and whether or not we see it as modifiable and measurable, influences significantly the way that we structure teaching, the curriculum and the education system itself. There has been a shift in our understanding of human intelligence away from something that is genetically based, towards something that is modifiable through effort and being developed continuously throughout our lifetimes. (Gałązka, 2013)

In drama we develop and use all intelligences allowing all learners to participate fully in the lesson.

Linguistic – dramatic play and language develop congruently. Drama usually involves spoken language both spontaneously through improvisation and in performance. Drama integrates the spoken and written word, most commonly through play-scripting, and develops understanding of text and sub-text.

Logical-mathematical - Problem solving is central to the drama process. Most dramas involve pupils as characters with problems to solve in role. Presenting and performing also involves a variety of problem solving.

Spatial - The use of physical and personal space between characters both practically and symbolically (in relation to meaning) is of importance in drama. This is true within lessons and for staging productions.

Bodily-kinesthetic - Some dramatic play is very physical. Drama involves using and understanding the effects of contrasting movement and stillness. It requires and develops physical control of the body and its gestures and movements. Some types of drama such as physical theatre and dance-drama are particularly physically focused and demanding.

Musical – Music is used frequently in drama as a stimulus or as an accompaniment to create atmosphere or to tag the emotional experience aurally. Music is sometimes composed within drama lessons as an integral part of the drama itself.

Interpersonal - Social interaction and co-operation, the ability to work with others, is a central feature of successful dramatic play and working in and through drama. Listening well to each other's' ideas, gauging co-participants' needs, empathizing, appreciating different viewpoints and responding sensitively to them, is key to successful drama making.

Intrapersonal - The arts are closely linked with recognizing, understanding and developing one's personal feelings and responses and working with one's 'self'. Dramatic play helps develop a sense of self. Drama involves accessing personal feelings and emotions and then using them to guide behaviour through role, initially in imagined worlds, and then later, in the real world.

Naturalistic - Drama can focus on the development of naturalistic intelligence or use it in the devising of dramas.

Spiritual - Drama involves and inspires reflection and contemplation on the human condition and identity. Drama clarifies life situations and then supports the imagination, enabling the individual to rise above the boundaries of these situations, supporting growth and transformation. (Baldwin, 2004)

The number of intelligences is not important. What is important is that teachers and pupils are aware that all learners have different intelligence profiles, preferred learning styles and gateways to learning. This leads teachers to an appreciation of pupils' preferred learning styles. It helps children to understand that how they may learn best can impact positively on their vision of themselves as a learner. It is not a question of teaching only in the pupils' preferred ways but of ensuring that learning is accessible to all pupils and planning for multi-intelligent learning. It may be that many children who are deemed to have learning difficulties are not being taught in ways that accord with their intelligence profiles and that enable them to learn.

If we accept that dramatic play is an effective and natural learning medium, and then match what it involves against Howard Gardner's range of multi-intelligences, we may have an enhanced understanding as to why it is so effective. Both dramatic play and drama utilize, integrate and develop simultaneously a broad range of intelligences and are therefore a gateway to learning for pupils with a range of preferred learning styles. Drama as a teaching and learning medium utilizes and develops the range of multi-intelligences in an integrated way, offering multisensory access to learners with different preferred learning styles. Drama Strategies and conventions take account of and develop the range of intelligences. They offer multi-intelligent access to information, ideas and concepts and gives opportunity to participants to make, respond, express and communicate meanings and ideas multi-intelligently through a range of aesthetic forms, through the creative juxtaposition of images, movement, words and sounds.

3. Drama and emotional intelligence

The term 'emotional intelligence' is a fairly new one in educational parlance and links to the ideas of Daniel Goleman, who argues the importance of developing pupils' emotional intelligence. Goleman considers that anger, sadness, fear and other negative emotions can have damaging effects on our well-being and therefore our lives, and can also have a negative impact on a child's ability to learn. Children learn best when they are in a state of rational and emotional balance, or what Csikszentmihalyi refers to as 'flow'.

We know that body and mind are linked physically, cognitively and emotionally and teachers need to recognize and support the integrated development of all three areas within their teaching and to seek safe and positive ways of doing so. Thinking and acting cognitively but without reference to emotion can have negative Drama offers a stimulating and rich opportunity to discuss and understand our own emotions, attitudes and beliefs through observing, empathizing with, feeling and exploring the emotions of characters both portrayed and interacted with in role. In drama there is a safe and distanced opportunity to recognize and talk about emotions together.

When a child is playing a character of their own creation within a class drama they are having to consider how to react and act as another person. To do this successfully they will need to draw on what they know and have actually experienced emotionally. They will need to link real and imagined emotional experiences in order to develop a plausible character. Although the child will develop the character through working in role they will be consciously or unconsciously feeling and responding as themselves within the drama and this may support the development of their emotional intelligence as it will be a teacher and class mediated experience.

When children are devising drama there is opportunity for trying out a range of ways of reacting as a character and discussing with other people which is most constructive. Characters' actions and the consequences of actions can be considered rationally and emotionally with others, acted, re-enacted and reflected on individually and together with peers and with the teacher as a mediator.

Drama also gives opportunity for the modelling of constructive interactions and relationships - modelling caring relationships and conflict resolution strategies for example. Observing or enacting characters who are behaving with emotional intelligence can give children fresh ways of acting and talking in emotionally charged situations, of observing and trying out what the positive impact might be on them and on others if they respond in different ways. Conversely, considering why emotionally unhealthy characters are behaving as they do and replaying scenes in which we can see how the outcomes could be different for that character also informs us emotionally. A good drama lesson can be a safe forum within which participants can be guided and managed to become increasingly aware of emotions, can be helped to recognize and name them and can enact and rehearse taking control of them competently and intelligently. This may be done in role but the feeling through engagement with role is real and the learning is transferable.

Drama is a place for feeling and trying out emotions in a controlled way, for being guided in reading the emotions of other people and gaining more understanding of the impact of one's own and others' emotions. Participants are not held personally responsible once outside the drama, for the actions and feelings of the characters they create and portray within the drama. Emotional competence has a 'feel-good' factor, which is intrinsically motivating.

The development of emotional intelligence is supported through drama by self-talk and self-awareness. Drama strategies support inner dialogue and give structured opportunities to voice it. Working in role heightens awareness of self through distancing from and returning to 'self'.

Drama is a social activity and focuses on analysing and acting on cues. Problem solving and decision making are applied to feelings. All dramas have problems to be solved together and decisions for characters to make. Drama strategies give opportunity to make emotions and thoughts explicit and shared and then make and reflect on intelligent decisions collaboratively and understanding other perspectives.

Working in a range of roles and interacting with others in role is a powerful way of engaging with other people's perspectives, which encourage on-going of our own. Research by Harland (2000) suggests that participation in drama leads to a positive atmosphere and environment and enhanced enjoyment.

References

- Baldwin P, Drama in mind, Network Educational Press, Stafford 2004
 Csikszentmihalyi M, Creativity: flow and the psychology of discovery and invention, Harper Collins Publishers, New York 1996
 Gardner H, Frames of Mind. The theory of Multiple Intelligences, Basic Books New York 1985
 Gałazka, A, Creating emotional wisdom – drama in the bilingual nursery. In: *The Teacher* 2012, 8-9

MAGIC SCIENCE: INTRODUCING MYSTERY TO LEARNING SCIENTIFIC INQUIRY

Ran Peleg¹, Dvora Katchevich¹, Malka Yayon¹, Rachel Mamlok-Naaman¹,
Johanna Dittmar², Peter McOwan³, Peter Childs⁴, Tony Sherborne⁵, Julie Jordan⁵,
Marina Carpineti⁶, Marco Giliberti⁶, Cristina Olivotto⁷ & Ingo Eilks²

¹Weizmann Institute of Science (Israel)

²University of Bremen (Germany)

³Queen Mary University of London (United Kingdom)

⁴University of Limerick (Ireland)

⁵Sheffield Hallam University (United Kingdom)

⁶University of Milan (Italy)

⁷Sterrenlab (The Netherlands)

Abstract

Consisting of eleven partners across Europe, TEMI science education project is funded by the European Commission under the Seventh Framework Programme. The TEMI consortium strongly believes that students should feel that something mysterious is about to be unveiled every time the science teacher enters the classroom and that students themselves should actively contribute to the process of investigation. TEMI teacher training workshops aim to transform science and mathematics teaching practice across Europe by giving teachers new skills to engage with their students, exciting new teaching resources and extended support needed to effectively introduce enquiry based learning into their classrooms. All TEMI actions are based around core scientific concepts and emotionally engaging activities of solving mysteries and exploring the unknown. The TEMI workshop will begin with an activity that will introduce the participants to the four theoretical pillars supporting the TEMI rationale: (1) Develop curiosity and interest through mysteries; (2) The 5E learning cycle for enquiry; (3) Gradual Release of Responsibility model; and (4) Maintaining motivation with the help of showmanship. The second part of the workshop will be dedicated to a TEMI mystery activity developed by the consortium. Through an engaging open ended mystery story, the activity leads participants to conduct investigations as a learning tool. The TEMI trainers will explain the learning passages, highlight the strong and critical points to implement the TEMI methodology and recount insights from classroom observations. The workshop will conclude with a discussion about the activity and a question and answer session about the TEMI methodology in Europe. the TEMI workshop will provide participants with a way to reflect upon in an active and engaging way.

Keywords: *Science, inquiry based science education, mysteries, gradual release of responsibility*

1. Introduction

Scientific inquiry stands for the ways scientists work to create a better understanding of the natural world. However inquiry is also a way of learning for students in science lessons. The educational concept of learning science by inquiry has gained much popularity in recent years. Despite the recent surge in popularity, the idea is generally is much older. Today, inquiry learning is generally referred to the National Science Educational Standards of the United States from the 1990s, where scientific inquiry was defined as "the various ways in which scientists study the natural world and propose explanations based on the evidence derived from their work. Scientific inquiry so refers to the activities through which students develop knowledge and understanding of scientific ideas, as well as to understanding of how scientists study the natural world" (National Research Council, 1996, p 23).

Since inquiry-based science education (IBSE) offers a student-centered and problem-driven teaching practice (Lunetta, Hofstein, Clough, 2007), it has been a major factor in recent science education reforms. This has been reflected in a series of EU projects promoting IBSE in recent years by developing innovative teaching and learning materials and offering corresponding teacher continuous professional development (such as the PROFILES, S-TEAM and Fibonacci projects). The TEMI project (Teaching Enquiry with Mysteries Incorporated) is such an IBSE centered project funded under the 7th Framework

Programme by the EU from 2013 to 2016. TEMI focuses on providing science teachers with tools needed to teach IBSE in a motivating and effective manner by initiating inquiry using unexpected and surprising phenomena and by implementing an innovative model for inquiry learning.

2. Innovations by the TEMI project

The TEMI workshop will begin with an activity that will introduce the participants to the four theoretical pillars supporting the TEMI rationale: (1) Develop curiosity and interest through mysteries; (2) Maintaining motivation with the help of showmanship; (3) The 5E learning cycle for enquiry; and (4) Gradual Release of Responsibility model. The second part of the workshop will be dedicated to a TEMI mystery activity developed by the consortium. Through an engaging open ended mystery story, the activity leads participants to conduct investigations as a learning tool.

2.1. Using Productive Mysteries

TEMI wants to make use of unknown and uncommon observations that we call mysteries. Within the TEMI project, we define a mystery as follows:

A phenomenon or event that induces the perception of suspense and wonder in the learner, initiating an emotion-laden 'want-to-know' feeling which promotes curiosity and initiates the posing of questions to be answered by inquiry and problem-solving activities.

Whether a phenomenon induces a 'want-to-know' feeling or not - depends on the student observing it. To evoke feelings of suspense and wonder, the mystery should challenge the student's curiosity. However, what piques a student's curiosity will depend on the student's interests, experiences and prior knowledge. Since interest, experience and prior knowledge will differ considerably from one student to another, a phenomenon that might be a mystery to one student may not challenge another – for example, if an observation deals with an already known and understood phenomenon or scientific concept. The varying perceptions can also be linked to age, personal living conditions or cultural backgrounds. Thus, the perception of mystery varies from one individual to the other. Nevertheless, the TEMI project offers some suggestions that can guide teachers in selecting and developing a phenomenon as a mystery for promoting inquiry learning.

2.2. Engaging through showmanship

TEMI uses unexpected and unfamiliar phenomena or mysteries to pique curiosity and challenge the students into inquiry. One of the main factors that influence student engagement is the way the teacher implements the mystery. There are various ways to do this: showing a video or a demonstration, asking the students to undertake an experiment, teacher's performing of an unexpected experiment, using role play or telling a story. TEMI would like the teachers to develop their showmanship skills to present a mystery in a more exciting way.

Showmanship is not just for the theatre. Teachers do it, too. Many analogies have been drawn between the role of the teacher and that of an actor or a director. Both roles involve facing an audience, both must convey a message in a convincing and memorable manner and both must learn to improvise if something takes an unexpected turn. In fact both must be authentic (an audience will drift off if an actor does not fully step into a role – just as the students do if the teacher is not fully engaging them). That is not to say that the teacher *is* an actor, but the world of theatre has devised many tools and techniques to improve showmanship and to better master the art of performance, which can be used to let teachers present lessons in a motivating or fascinating way.

2.3. Employing the 5Es learning cycle

Inquiry-based science education has been adopted worldwide in the 21st century as one of the main models of school science education. Originally used in primary schools, it has been extended to secondary schools and is being adopted by many countries. Many EU-funded projects are exploring the use of inquiry in teaching science, and TEMI is one of them. One of the four innovations on which TEMI is based is the use of inquiry and the 5E model.

The National Science Education Standards (NSES, 1996) in the USA provide the following definition of inquiry:

Inquiry is a set of interrelated processes by which scientists and students pose questions about the natural world and investigate phenomena; in doing so, students acquire knowledge and develop a rich understanding of concepts, principles, models, and theories. Inquiry is a critical component of a science program at all grade levels and in every domain of science, and designers of curricula and programs must be sure that the approach to content, as well as the

teaching and assessment strategies, reflect the acquisition of scientific understanding through inquiry. Students then will learn science in a way that reflects how science actually works.

The standards outline six aspects that are pivotal to inquiry learning in science education:

1. Students should be able to recognize that science is more than memorizing and knowing facts.
2. Students should have the opportunity to develop new knowledge that builds on their prior knowledge and scientific ideas.
3. Students will develop new knowledge by restructuring their previous understandings of scientific concepts and adding new information learned.
4. Learning is influenced by students' social environment whereby they have an opportunity to learn from each other.
5. Students will take control of their learning.
6. The extent to which students are able to learn with deep understanding will influence how transferable their new knowledge is to real-life contexts.

2.4. Ensuring gradual release of responsibility with students

The TEMI method also lets teachers gradually release the responsibility of learning to the students. Through a series of different levels of inquiry, the student becomes more able to carry out his or her own independent inquiry. The assistance of the teacher becomes different, less instructive, but more enabling and flexible. This can seem quite unusual for some teachers, but inquiry-based learning provides students with not only a better understanding but also a stronger scientific approach in the study of science.

There are various levels of inquiry in science education – the initial level where the teacher directs every aspect to the highest level where the student is in control. The aim of inquiry-based learning is to move students through these levels, from closed, directed inquiry to open-ended inquiry, where they need the intellectual and practical skills to become investigators and researchers.

3. Conclusion

The article gives an introduction to the TEMI project, the 5E inquiry cycle, ways in which teachers can allow students to become better independent learners, and strategies for developing the skills needed for enabling inquiry-based learning using mysteries. The TEMI website features many classroom resources as well as the Mystery of the Month and smartphone apps that teachers can use in their teaching. The authors believe that applying TEMI to teaching will improve student attainment and create more impactful teaching.

References

- Blanchard, M.R., Southerland, S.A., Osborne, J.W., Sampson, V.D., Annetta, L.A., & Granger, E.M. (2010) Is inquiry possible in light of accountability?: A quantitative comparison of the relative effectiveness of guided inquiry and verification laboratory instruction. *Science Education*. 94(4), pp. 577–616.
- Bybee, R., Taylor, J. A., Gardner, A., Van Scotter, P., Carlson, J., Westbrook, A., & Landes, N. (2006). *The BSCS 5E instructional model: Origins and effectiveness*. Colorado Springs: BSCS.
- Goldsmith, R.H. (2000). Magic Sand. *Journal of Chemical Education*, 77(1), pp. 41.
- Lin, J.-L., Cheng, M.-F., Chang, Y.-C., Li, H.-W., Chang, J.-Y., Lin, D.-M. (2014). Learning activities that combine science magic activities with the 5E instructional model to influence secondary-school students' attitudes to science. *Eurasia Journal of Mathematics, Science & Technology Education*, 10(5), pp. 415-426.
- Lunetta, V. N., Hofstein, A., & Clough, M. P. (2007). Learning and teaching in the school science laboratory: An analysis of research, theory, and practice. In S. Abell & N. Lederman (Eds), *Handbook of Research in Science Education*. Mahwah, Lawrence Elbaum.
- National Research Council. (1996) *National science education standards*. Washington: National Academy.
- Pearson, P.D., & Gallagher, M.C. (1983). The instruction of reading comprehension. *Contemporary Educational Psychology*, 8, pp. 317-344.
- Tafoya, E., Sunal, D., & Knecht P. Assessing enquiry potential: A tool for curriculum decision makers. *School Science and Mathematics*, 80(1), pp. 43–48.
- Vitz, E. (1990). Magic Sand: Modelling the hydrophobic effect and reversed-phase liquid chromatography. *Journal of Chemical Education*, 67, pp. 512–515.
- TEMI project website (available in several languages) - www.teachingmysteries.eu

AUTHOR INDEX

Adam, A.	126	Childs P.	633
Agbo, S.	53	Çolak, Ö.	558
Aguirre, C.	340	Correia, S.	184
Akdag, F.	358	Costa, J.	454
Alessandrini, G.	421	Cruz, J.	155
Alicja Gałązka, A.	630	Csernoch, M.	44, 380
Almeida, A.	627	Cubas, A.	564
Almeida, F.	189	Cullen, P.	54
Álvarez-Álvarez, C.	175	Cunha, A.	160
Alves, J.	616	Cysneiros, G.	155
Anastasiou, E.	276	Damiani, P.	589
Antony-Newman, M.	27	Dapena, A.	548
Araujo, B.	160	De Natale, M.	179
Arcidiacono, F.	251	Dettlaff, M.	548
Argyropoulos, V.	209, 214	Dittmar, J.	633
Attila, H.	18, 485	Domínguez, R.	552
Àvila, X.	146	Dowdall, S.	189
Aydınbek, C.	396	Duchesne, C.	467
Bacsa-Bán, A.	475	Durmaz, H.	546, 558
Bahnik, P.	234	Dutra, A.	564
Barbosa, J.	83, 239	Dyg, P.	300
Bauer, U.	184, 627	Edelman, D.	401
Beach, D.	136	Eilks, I.	633
Ben-Uri, I.	87	Elias, C.	271
Bényei, R.	509	Fadini, K.	603
Bione, F.	155	Finardi, K.	593, 603
Biro, P.	380	Floresta, M.	83, 239
Bodnár, E.	18, 485	Fok, L.	170
Bollaert, H.	189	Fraser, K.	527
Bonin, P.	27	Frohman, R.	324
Boothe, D.	199	Gagnon, N.	467
Borgolte, U.	234	Gagnon, R.	141, 467
Boucher, J.	77	Gajda, K.	319
Breitenbach, A.	391, 551	Gałązka, A.	630
Briones, E.	194, 361	Gallo, A.	584
Brower, T.	8	García-Salgado, S.	553
Brown, E.	13	Garzia, M.	305
Bruland, D.	627	Gauthier, K.	77
Burlak, G.	72	Gavora, P.	524, 530
Butler, K.	432	Gazaille, M.	77
Cabral, I.	616	Gentry, R.	491
Cabral, M.	375, 516	Gerin-Lajoie, D.	27
Çağanağa, C.	106	Gerke, M.	234
Campanino, M.	305	Germano, J.	611
Carpineti, M.	633	Giannias, D.	579
Caspary, M.	199	Giliberti, M.	633
Cavalheiro, G.	184	Giraldo, M.	598
Cheang, F.	170	Gombos, E.	44
Chen, K.	542	Gómez-Linares, A.	194

Gonçalves, F.	243	Lima Júnior, J.	155
Gonzalez, L.	146	Liu, D.	335
Gosselin, L.	77	Liu, H.	62
Gravelle, F.	467	Liu, X.	620
Guthrie L.	513	Liu, Y.	62
Haller, A.	261, 503	Lopes, E.	627
Havice, P.	229	Lourenço, J.	189
Havice, W.	229	Machado, M.	564
Heredia, M.	552	Maciel, S.	500
Hernandez, J.	72, 536	MacKeldey, A.	256
Herter, R.	542	Magnago, R.	564
Hłobaż, A.	189	Malacinski, G.	41
Holanda, M.	510	Malin, A.	315
Hon, T.	131	Malouf, N.	324
HoYeung, C.	539	Mamluk-Naaman, R.	633
Hyun, E.	353	Manasis, C.	271
Iloanya, J.	101	Mandl, H.	608
Ishibashi, K.	151, 416, 570	Mangione, G.	305
Jacobs, H.	91	Marinelli, L.	54
Jairo, J.	57	Marin-Garcia, J.	598
Jordan, J.	633	Martínez-Gómez, M.	598
Katchevich, D.	633	Martos, A.	209
Katsiafourou, E.	214	Masár, I.	234
Kaymakamoğlu, S.	106	Masson, J.	494
Kio, S.	165	Mccreesh, C.	527
Kivilehto, S.	315	McOwan, P.	633
Knox, P.	513	Md-Ali, R.	67
Kołodziejczyk, J.	436, 488	Mele, E.	271
Kołodziejczyk, J.	440, 561	Melero, M.	361
Kopp, B.	608	Mello, R.	83, 239
Koshmanova, T.	286	Mendonça, R.	506
Koutsogiorgou, S.	214	Mesquita, A.	204
Krejci, J.	121	Mesquita, L.	611
Krishnasamy, H.	67	Milczarski, P.	189
Ktena, A.	271, 281	Miralpeix, A.	146
Kucharski, M.	449	Miranda, D.	573
Kuo, L.	224	Moecke, E.	564
Kwan, P.	444	Mohamad, J.	23
Lai, M.	431	Mohapi, S.	49
Lam, I.	540	Monteiro, I.	611
Lara-González, G.	459	Monteiro, M.	611
Larionov, V.	96	Moreno-Badajós, P.	536
Larivée, S.	478, 573	Mousinho, R.	497, 506, 510
Leão, M.	243	Munday, Z.	411
Lee, R.	353	Mutlu, S.	545
Lee, Y.	469	Navrátilová, H.	370, 524
Lemańska, M.	548	Newton, P.	454
Lider, A.	96	Niedermeier, S.	608

Nikolarazi, M.	209, 214	Rondestvedt, A.	386
Nomakuchi, T.	151, 416, 570	Rossato, I.	564
Nováková, K.	248	Rostas, M.	533
Nowak-Fabrykowski, K.	3	Royal, E.	432
Nunes, L.	627	Saboga-Nunes, L.	184
Obando, C.	266	Santana, D.	155, 243
Ojando, E.	146	Santos, A.	184
Okan, O.	184, 627	Santos, H.	155
Olarte, F.	57	Santos, M.	555
Oliveira, E.	243	Santos, W.	155, 243
Olivotto, C.	633	Sass, J.	18, 485
O'Reilly, D.	189	Sathler, C.	510
Oweini, A.	23	Schols, M.	482
Ozdinc, T.	358	Šebková, L.	111
Ozyildirim, H.	545	Sena, G.	611
Padiglia, S.	251	Sénéchal, C.	478, 479, 573
Pak, N.	53	Sfakianaki, E.	579
Paloma, F.	584, 589	Sherborne, T.	633
Palomera, R.	194, 361	Sideridis, G.	209
Pálvölgyi, K.	18, 485	Silva Júnior, N.	243
Papa, R.	519, 528	Silva, A.	555
Papazafiri, M.	214	Silva, J.	155
Parker, L.	454	Silva, L.	555
Pazik, A.	319	Silva, P.	204
Pazolline, H.	243	Silva, S.	500
Peleg, R.	633	Silveira, N.	593
Pereira, A.	627	Simon, J.	146
Pereira, M.	472, 500	Simonetti, C.	179
Peters, F.	454	Sirotova, M.	329
Pettenati, M.	305	Smith, R.	385
Phillips-Staley, E.	516	Soares, L.	83, 239
Phindane, P.	365	Solà, J.	345
Pinheiro, P.	184, 627	Song, R.	62
Plantegenest, G.	266	Sønsthagen, A.	426
Player-Koro, C.	136	Souto-Salorio, M.	548
Podlaski, K.	189	Souza, H.	155, 243
Ponce-Rojo, A.	536	St-Germain, M.	479
Prats, M.	146	Stolk, J.	542
Putz, L.	261, 503	Tavares, A.	616
Quijano, M.	552	Teixeira, M.	155, 243
Räty, M.	315	Ting, A.	400
Ravchyna, T.	286	Torralba, R.	552
Reynolds, P.	291	Torres, I.	155, 243
Ribeiro, A.	472	Trna, J.	116, 121
Říhová, A.	219	Trnova, E.	116, 121
Rio, L.	584, 589	Tsalkitzi, E.	271
Rodrigues, N.	506	Tseng, H.	32
Romano, V.	432	Valverde, P.	295

Vargas, L.	57
Veloo, A.	67
Ventayol, J.	37
Vhurumuku, E.	348
Vieira, D.	204
Vitásková, K.	111, 219
Wang, L.	431
Wang, Y.	568
Ward, A.	82
Wiegerová, A.	524, 530
Wójcik-Augustyniak, M.	406
Wong, S.	334
Ximenes, A.	521
Yanata, S.	151, 416, 570
Yang, H.	224
Yayon, M.	633
Yeung, Y.	170, 539
Zambaldi, N.	310
Zhao, Y.	62