

Turkish Online Journal of Educational Technology

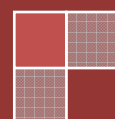
Volume 14, Issue 3
July 2015

Prof. Dr. Aytekin İşman
Editor-in-Chief

Prof. Dr. Jerry WILLIS - ST John Fisher University in Rochester, USA
Prof. Dr. J. Ana Donaldson - AECT President
Editors

Assist.Prof.Dr. Fahme DABAJ - Eastern Mediterranean University, TRNC
Associate Editor

Assoc.Prof.Dr. Eric Zhi - Feng Liu - National Central University, Taiwan
Assistant Editor





**THE
TURKISH ONLINE
JOURNAL
OF
EDUCATIONAL
TECHNOLOGY**

July 2015
Volume 14 - Issue 3

Prof. Dr. Aytekin İşman
Editor-in-Chief

Editors
Prof. Dr. Jerry Willis
Prof. Dr. J. Ana Donaldson

Associate Editor
Assist. Prof. Dr. Fahme Dabaj

Assistant Editor
Assoc. Prof. Dr. Eric Zhi - Feng Liu

ISSN: 2146 - 7242

Indexed by
Education Resources Information Center – **ERIC**
SCOPUS - ELSEVIER

Copyright © THE TURKISH ONLINE JOURNAL OF EDUCATIONAL TECHNOLOGY

All rights reserved. No part of TOJET's articles may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without permission in writing from the publisher.

Published in TURKEY

Contact Address:
Prof. Dr. Aytekin İŞMAN
TOJET, Editor in Chief
Sakarya-Turkey

Message from the Editor-in-Chief

Dear Colleagues,

We are very pleased to publish volume 14 issue 3 in 2015. As an editor-in-chief of The Online Journal of Educational Technology (TOJET), this issue is the success of the reviewers, editorial board and the researchers. In this respect, I would like to thank to all reviewers, researchers and the editorial road.

This issue covers different research scopes, approaches which subjects about educational technology by valuable researchers. I and The Online Journal of Educational Technology (TOJET), editorial team will be pleased to share various researches with this issue as it is the miracle of our journal. All authors can submit their manuscripts to tojet.editor@gmail.com for the next issues.

TOJET will organize IDEC-2015 International Distance Education Conference (www.id-ec.net) and ITEC-2015 International Teacher Education Conference (www.ite-c.net) between September 02-04, 2015 in Russia. They promote the development and dissemination of theoretical knowledge, conceptual research, and professional knowledge through conference activities. Its focus is to create and disseminate knowledge about distance education. IDEC-2014 and ITEC 2014 conference books have been published.

Call for Papers

TOJET invites you for article contributions. Submitted articles should be about all aspects of educational technology. The articles should be original, unpublished, and not in consideration for publication elsewhere at the time of submission to TOJET. Manuscripts must be submitted in English.

TOJET is guided by it's editors, guest editors and advisory boards. If you are interested in contributing to TOJET as an author, guest editor or reviewer, please send your CV to tojet.editor@gmail.com.

July 01, 2015

Editor in Chief

Prof. Dr. Aytakin ISMAN

Editorial Board

Editors

Prof. Dr. Aytekin İŞMAN - Sakarya University, Turkey
Prof. Dr. Jerry WILLIS - ST John Fisher University in Rochester, USA
Prof. Dr. J. Ana Donaldson – AEECT, Past President

Associate Editor

Assist.Prof.Dr. Fahme DABAJ - Eastern Mediterranean University, TRNC

Assistant Editor

Assoc.Prof.Dr. Eric Zhi - Feng Liu - National Central University, Taiwan

Editorial Board

Prof.Dr. Ahmet Zeki Saka - Karadeniz Technical University, Turkey
Prof.Dr. Akif Ergin - Başkent University, Turkey
Prof.Dr. Ali Al Mazari - Alfaisal University, Kingdom of Saudi Arabia
Prof.Dr. Ali Ekrem Özkul - Anadolu University, Turkey
Prof.Dr. Antoinette J. Muntjewerff - University of Amsterdam
Prof.Dr. Arif Altun - Hacettepe University, Turkey
Prof.Dr. Arvind Singhal - University of Texas, USA
Prof.Dr. Asaf Varol - Fırat University, Turkey
Prof.Dr. Aytekin İşman - Sakarya University, Turkey
Prof.Dr. Brent G. Wilson - University of Colorado at Denver, USA
Prof.Dr. Buket Akkoyunlu - Hacettepe University, Turkey
Prof.Dr. Cengiz Hakan Aydın - Anadolu University, Turkey
Prof.Dr. Chang-Shing Lee - National University of Tainan, Taiwan
Prof.Dr. Charlotte N. (Lani) Gunawardena - University of New Mexico, USA
Prof.Dr. Chi - Jui Lien - National Taipei University of Education, Taiwan
Prof.Dr. Chih - Kai Chang - National University of Taiwan, Taiwan
Prof.Dr. Chin-Min Hsiung - National pingtung university, Taiwan
Prof.Dr. Colin Latchem - Open Learning Consultant, Australia
Prof.Dr. Colleen Sexton - Governor State University, USA
Prof.Dr. Demetrios G. Sampson - University of Piraeus, Greece
Prof.Dr. Dimitar G. Velev - University of National and World Economy, Bulgaria
Prof.Dr. Don M. Flourney - Ohio University, USA
Prof.Dr. Dongsik Kim - Hanyang University, South Korea
Prof.Dr. Enver Tahir Rıza - Dokuz Eylül University, Turkey
Prof.Dr. Eralp Altun - Ege University, Turkey
Prof.Dr. Feng-chiao Chung - National pingtung university, Taiwan
Prof.Dr. Ferhan Odabaşı - Anadolu University, Turkey
Prof.Dr. Finland Cheng - National pingtung university, Taiwan
Prof.Dr. Fong Soon Fook - Universiti Sains Malaysia, Malaysia
Prof.Dr. Francine Shuchat Shaw - New York University, USA
Prof.Dr. Gianni Viardo Vercelli - University of Genova, Italy
Prof.Dr. Gwo - Dong Chen - National Central University Chung - Li, Taiwan
Prof.Dr. Hafize Keser - Ankara University, Turkey
Prof.Dr. Halil İbrahim Yalın - Gazi University, Turkey
Prof.Dr. Heli Ruokamo - University of Lapland, Finland
Prof.Dr. Henry H.H. Chen - National pingtung university, Taiwan
Prof.Dr. Ing. Giovanni Adorni - University of Genova, Italy
Prof.Dr. J. Ana Donaldson - AEECT President
Prof.Dr. J. Michael Spector - University of North Texas, USA
Prof.Dr. Jerry Willis - ST John Fisher University in Rochester, USA
Prof.Dr. Jie-Chi Yang - National central university, Taiwan
Prof.Dr. Kinshuk - Athabasca University, Canada
Prof.Dr. Kiyoshi Nakabayashi - Chiba Institute of Technology, Japan
Prof.Dr. Kumiko Aoki - The Open University of Japan, Japan
Prof.Dr. Kuo - En Chang - National Taiwan Normal University, Taiwan
Prof.Dr. Kuo - Hung Tseng - Meiho Institute of Technology, Taiwan
Prof.Dr. Kuo - Robert Lai - Yuan - Ze University, Taiwan

- Prof.Dr. Liu Meifeng - Beijing Normal University, China
Prof.Dr. Marina Stock Mcisaac - Arizona State University, USA
Prof.Dr. Mehmet Ali Dikermen - Middlesex University, UK
Prof.Dr. Mehmet Çağlar - Near East University, TRNC
Prof.Dr. Mehmet Gürol - Firat University, Turkey
Prof.Dr. Mehmet Kesim - Anadolu University, Turkey
Prof.Dr. Mei-Mei Chang - National pingtung university, Taiwan
Prof.Dr. Melissa Hui-Mei Fan - National central university, Taiwan
Prof.Dr. Min Jou - National Taiwan Normal University, Taiwan
Prof.Dr. Ming - Puu Chen - National Taiwan Normal University, Taiwan
Prof.Dr. Murat Barkan - Yaşar University, Turkey
Prof.Dr. Mustafa Murat Inceoğlu - Ege University, Turkey
Prof.Dr. Mustafa Şahin Dündar - Sakarya University, Turkey
Prof.Dr. Nabi Bux Jumani - International Islamic University, Pakistan
Prof.Dr. Nian - Shing Chen - National Sun Yat - Sen University, Taiwan
Prof.Dr. Paul Gibbs - Middlesex University, UK
Prof.Dr. Petek Aşkar - Hacettepe University, Turkey
Prof.Dr. Ramdane Younsi - Ecole polytechnique de Montreal, Canada
Prof.Dr. Rauf Yıldız - Çanakkale 19 Mart University, Turkey
Prof.Dr. Roger Hartley - University of Leeds, UK
Prof.Dr. Rozhan Hj. Mohammed Idrus - Universiti Sains Malaysia, Malaysia
Prof.Dr. Saedah Siraj - University of Malaya, Malaysia
Prof.Dr. Sello Mokoena - University of South Africa, South Africa
Prof.Dr. Servet Bayram - Yeditepe University, Turkey
Prof.Dr. Shan - Ju Lin - National Taiwan University, Taiwan
Prof.Dr. Sheng Quan Yu - Beijing Normal University, China
Prof.Dr. Shi-Jer Lou - National pingtung university, Taiwan
Prof.Dr. Shu - Sheng Liaw - China Medical University, Taiwan
Prof.Dr. Shu-Hsuan Chang - National Changhua University of Education, Taiwan
Prof.Dr. Stefan Aufenanger - University of Mainz, Germany
Prof.Dr. Stephen Harmon - Georgia State University, USA
Prof.Dr. Stephen J.H. Yang - National Central University, Taiwan
Prof.Dr. Sun Fuwan - China Open University, China
Prof.Dr. Sunny S.J. Lin - National Chiao Tung University, Taiwan
Prof.Dr. Teresa Franklin - Ohio University, USA
Prof.Dr. Toshio Okamoto - University of Electro - Communications, Japan
Prof.Dr. Toshiyuki Yamamoto - Japan
Prof.Dr. Tzu - Chien Liu - National Central University, Taiwan
Prof.Dr. Ülkü Köymen - Lefke European University, TRNC
Prof.Dr. Vaseudev D.Kulkarni - Hutatma Rajjguru College, Rajguruunagar(Pune),(M.S.) INDIA
Prof.Dr. Xibin Han - Tsinghua University, China
Prof.Dr. Yau Hon Keung - City University of Hong Kong, Hong Kong
Prof.Dr. Yavuz Akpınar - Boğaziçi University, Turkey
Prof.Dr. Yen-Hsyang Chu - National central university, Taiwan
Prof.Dr. Yuan - Chen Liu - National Taipei University of Education, Taiwan
Prof.Dr. Yuan-Kuang Guu - National pingtung university, Taiwan
Prof.Dr. Young-Kyung Min - University of Washington, USA
- Assoc.Prof.Dr. Abdullah Kuzu - Anadolu University, Turkey
Assoc.Prof.Dr. Adile Aşkın Kurt - Anadolu University, Turkey
Assoc.Prof.Dr. Ahmet Eskicümalı – Sakarya University
Assoc.Prof.Dr. Aijaz Ahmed Gujjar - Sindh Madressatul Islam University, Pakistan
Assoc.Prof.Dr. Aytaç Göğüş - Sabancı University, Turkey
Assoc.Prof.Dr. Chen - Chung Liu - National Central University, Taiwan
Assoc.Prof.Dr. Cheng - Huang Yen - National Open University, Taiwan
Assoc.Prof.Dr. Ching - fan Chen - Tamkang University, Taiwan
Assoc.Prof.Dr. Ching Hui Alice Chen - Ming Chuan University, Taiwan
Assoc.Prof.Dr. Chiung - sui Chang - Tamkang University, Taiwan
Assoc.Prof.Dr. Danguole Rutkauskienė - Kauno Technology University, Lietvenia
Assoc.Prof.Dr. David Tawei Ku - Tamkang University, Taiwan
Assoc.Prof.Dr. Eric Meng - National pingtung university, Taiwan

- Assoc.Prof.Dr. Eric Zhi Feng Liu - National central university, Taiwan
Assoc.Prof.Dr. Erkan Tekinarslan - Bolu Abant İzzet Baysal University, Turkey
Assoc.Prof.Dr. Ezendu Ariwa - London Metropolitan University, U.K.
Assoc.Prof.Dr. Fahad N. AlFahad - King Saud University
Assoc.Prof.Dr. Fahriye Altınay - Near East University, TRNC
Assoc.Prof.Dr. Gurnam Kaur Sidhu - Universiti Teknologi MARA, Malaysia
Assoc.Prof.Dr. Hao - Chiang Lin - National University of Tainan, Taiwan
Assoc.Prof.Dr. Hasan Çalışkan - Anadolu University, Turkey
Assoc.Prof.Dr. Hasan KARAL - Karadeniz Technical University, Turkey
Assoc.Prof.Dr. Hsin - Chih Lin - National University of Tainan, Taiwan
Assoc.Prof.Dr. Huey - Ching Jih - National Hsinchu University of Education, Taiwan
Assoc.Prof.Dr. Huichen Zhao - School of Education, Henan University, China
Assoc.Prof.Dr. Hüseyin Yaratın - Eastern Mediterranean University, TRNC
Assoc.Prof.Dr. I - Wen Huang - National University of Tainan, Taiwan
Assoc.Prof.Dr. I Tsun Chiang - National Changhua University of Education, Taiwan
Assoc.Prof.Dr. Ian Sanders - University of the Witwatersrand, Johannesburg
Assoc.Prof.Dr. İsmail İpek - Fatih University, Turkey
Assoc.Prof.Dr. Işıl Kabakcı - Anadolu University, Turkey
Assoc.Prof.Dr. Jie - Chi Yang - National Central University, Taiwan
Assoc.Prof.Dr. John I-Tsun Chiang - National Changhua University of Education, Taiwan
Assoc.Prof.Dr. Ju - Ling Shih - National University of Taiwan, Taiwan
Assoc.Prof.Dr. Koong Lin - National University of Tainan, Taiwan
Assoc.Prof.Dr. Kuo - Chang Ting - Ming - HSIN University of Science and Technology, Taiwan
Assoc.Prof.Dr. Kuo - Liang Ou - National Hsinchu University of Education, Taiwan
Assoc.Prof.Dr. Larysa M. Mytsyk - Gogol State University, Ukraine
Assoc.Prof.Dr. Li - An Ho - Tamkang University, Taiwan
Assoc.Prof.Dr. Li Yawan - China Open University, China
Assoc.Prof.Dr. Manoj Kumar Saxena - Central University of Himachal Pradesh, Dharamshala, Kangra, India
Assoc.Prof.Dr. Mike Joy - University of Warwick, UK
Assoc.Prof.Dr. Ming-Charng Jeng - National pingtung university, Taiwan
Assoc.Prof.Dr. Murat Ataizi - Anadolu University, Turkey
Assoc.Prof.Dr. Nergüz Serin - Cyprus International University, TRNC
Assoc.Prof.Dr. Norazah Mohd Suki - Universiti Malaysia Sabah, Malaysia
Assoc.Prof.Dr. Normaliza Abd Rahim - Universiti Putra Malaysia, Malaysia
Assoc.Prof.Dr. Oğuz Serin - Cyprus International University, TRNC
Assoc.Prof.Dr. Ping - Kuen Chen - National Defense University, Taiwan
Assoc.Prof.Dr. Popat S. Tambade - Prof. Ramkrishna More College, India
Assoc.Prof.Dr. Prakash Khanale - Dnyanopasak College, INDIA
Assoc.Prof.Dr. Pramela Krish - Universiti Kebangsaan Malaysia, Malaysia
Assoc.Prof.Dr. Tzu - Hua Wang - National Hsinchu University of Education, Taiwan
Assoc.Prof.Dr. Vincent Ru-Chu Shih - National Pingtung University of Science and Technology, Taiwan
Assoc.Prof.Dr. Wu - Yui Hwang - National Central University, Taiwan
Assoc.Prof.Dr. Ya-Ling Wu - National pingtung university, Taiwan
Assoc.Prof.Dr. Yahya O Mohamed Elhadj - AL Imam Muhammad Ibn Saud University, Saudi Arabia
Assoc.Prof.Dr. Yavuz Akbulut - Anadolu University
Assoc.Prof.Dr. Zehra Altınay - Near East University, TRNC
Assoc.Prof.Dr. Zhi - Feng Liu - National Central University, Taiwan
- Assist.Prof.Dr. Aaron L. Davenport - Grand View College, USA
Assist.Prof.Dr. Andreja Istenic Starcic - University of Primorska, Slovenija
Assist.Prof.Dr. Anita G. Welch - North Dakota State University, USA
Assist.Prof.Dr. Betül Özkan - University of Arizona, USA
Assist.Prof.Dr. Burçin Kısa Işık - Gaziantep University, Turkey
Assist.Prof.Dr. Chiu - Pin Lin - National Hsinchu University of Education, Taiwan
Assist.Prof.Dr. Chun - Ping Wu - Tamkang University, Taiwan
Assist.Prof.Dr. Chun - Yi Shen - Tamkang University, Taiwan
Assist.Prof.Dr. Chung-Yuan Hsu - National pingtung university, Taiwan
Assist.Prof.Dr. Dale Havill - Dhofar University, Sultanate of Oman
Assist.Prof.Dr. Ferman Konukman - College of Arts and Science, Sport Science Program, Qatar University
Assist.Prof.Dr. Filiz Varol - Firat University, Turkey
Assist.Prof.Dr. Guan - Ze Liao - National Hsinchu University of Education, Taiwan

Assist.Prof.Dr. Hsiang chin - hsiao - Shih - Chien University, Taiwan
Assist.Prof.Dr. Huei - Tse Hou - National Taiwan University of Science and Technology, Taiwan
Assist.Prof.Dr. Hüseyin Ünlü - Aksaray University, Turkey
Assist.Prof.Dr. Jagannath. K Dange - Kuvempu University, India
Assist.Prof.Dr. K. B. Praveena - University of Mysore, India
Assist.Prof.Dr. Kanvaria Vinod Kumar - University of Delhi, India
Assist.Prof.Dr. Marko Radovan - University of Ljubljana, Slovenia
Assist.Prof.Dr. Min-Hsien Lee - National central university, Taiwan
Assist.Prof.Dr. Mohammad Akram Mohammad Al-Zu'bi - Jordan Al Balqa Applied University, Jordan
Assist.Prof.Dr. Muhammet Demirbilek - Süleyman Demirel University, Turkey
Assist.Prof.Dr. Pamela Ewell - Central College of IOWA, USA
Assist.Prof.Dr. Pei-Hsuan Hsieh - National Cheng Kung University, Taiwan
Assist.Prof.Dr. Pey-Yan Liou - National central university, Taiwan
Assist.Prof.Dr. Phaik Kin, Cheah - Universiti Tunku Abdul Rahman, Kampar, Perak
Assist.Prof.Dr. Ping - Yeh Tsai - Tamkang University, Taiwan
Assist.Prof.Dr. S. Arulchelvan - Anna University, India
Assist.Prof.Dr. Seçil Kaya - Anadolu University, Turkey
Assist.Prof.Dr. Selma Koç Vonderwell - Cleveland State University, Cleveland
Assist.Prof.Dr. Sunil Kumar - National Institute of Technology, India
Assist.Prof.Dr. Tsung - Yen Chuang - National University of Taiwan, Taiwan
Assist.Prof.Dr. Vahid Motamedi - Tarbiat Moallem University, Iran
Assist.Prof.Dr. Yalın Kılıç Türel - Fırat University, Turkey
Assist.Prof.Dr. Yu - Ju Lan - National Taipei University of Education, Taiwan
Assist.Prof.Dr. Zehra Alakoç Burma - Mersin University, Turkey
Assist.Prof.Dr. Zerrin Ayyaz Reis - İstanbul University, Turkey
Assist.Prof.Dr. Zülfü Genç - Fırat University, Turkey

Dr. Arnaud P. Prevot - Forest Ridge School of the Sacred Heart, USA
Dr. Balakrishnan Muniandy - Universiti Sains Malaysia, Malaysia
Dr. Brendan Tangney - Trinity College, Ireland
Dr. Chen Haishan - China Open University, China
Dr. Chin Hai Leng - University of Malaya, Malaysia
Dr. Chin Yeh Wang - National Central University, Taiwan
Dr. Chun Hsiang Chen - National Central University, Taiwan
Dr. Chun Hung Lin - National central university, Taiwan
Dr. Farrah Dina Yusop - University of Malaya, Malaysia
Dr. Hj. Issham Ismail - Universiti Sains Malaysia, Malaysia
Dr. Hj. Mohd Arif Hj. Ismail - National University of Malaysia, Malaysia
Dr. I-Hen Tsai - National University of Tainan, Taiwan
Dr. Jarkko Suhonen - University of Eastern Finland, Finland
Dr. Li Ying - China Open University, China
Dr. Norlidah Alias - University of Malaya, Malaysia
Dr. Rosnaini Mahmud - Universiti Putra Malaysia, Malaysia
Dr. Sachin Sharma - Faridabad Institute of Technology, Faridabad
Dr. Seetharam Chittoor Jhansi - Pushpa Navnit Shah Centre for Lifelong Learning, India
Dr. Tam Shu Sim - University of Malaya, Malaysia
Dr. Tiong Goh - Victoria University of Wellington, New Zealand
Dr. Vikrant Mishra - Shivalik College of Education, India
Dr. Zahra Naimie - University of Malaya, Malaysia

Table of Contents

Academic Progress Depending on the Skills and Qualities of Learning in Students of a Business School <i>Araiza Vázquez María de JESÚS, Dörfer CLAUDIA, Castillo Corpus ROSALINDA</i>	1
Assessing ELT Pre-Service Teachers via Web 2.0 Tools: Perceptions toward Traditional, Online and Alternative Assessment <i>Nazlı Ceren CIRIT</i>	9
Design on the MUVE: Synergizing Online Design Education with Multi-User Virtual Environments (MUVE) <i>Isinsu SAKALLI, WonJoon CHUNG</i>	20
Designing Effective Curricula with an Interactive Collaborative Curriculum Design Tool (CCDT) <i>Seda KHADIMALLY</i>	32
Developing a Teaching Model using an Online Collaboration Approach for a Digital Technique Practical Work <i>Muchlas</i>	63
Examination on ICT Integration into Special Education Schools for Developing Countries <i>Fahriye ALTINAY AKSAL, Zehra ALTINAY GAZI</i>	70
Identification of Difficulties in the Consolidation of Research Processes at a Higher Education Institution: A Case Study <i>Alejandro Valencia ARIAS</i>	73
Individual Factors that Encourage the Use of Virtual Platforms of Administrative Sciences Students: A Case Study <i>Alejandro VALENCIA Arias, Salim CHALELA Naffah, Jonathan, BERMUDEZ Hernández, Luz Mirelia BEDOYA PÉREZ</i>	81
Preferences and Willingness for Participating MOOCS in Turkish <i>İrem ERDEM-AYDIN</i>	88
Pre-Service Teachers' Perceptions of ICT Integration in Teacher Education in Turkey <i>Aydın ASLAN, Chang ZHU</i>	97
Research and Trends in the Studies of Homeschooling Practices: A Review on Selected Journals <i>Khairul Azhar JAMALUDIN, Norlidah ALIAS, Dorothy DEWITT</i>	111
Seamless Support: Technology Enhanced Learning in Open Distance Learning at NWU <i>Hennie ESTERHUIZEN</i>	120
Student's Perception about Online Interaction, access and Publishing Content for Academic Use <i>Carlos Arturo Torres-GASTELÚ, Agustín Lagunes DOMINGUEZ, María Alicia Flores GARCÍA, Gábor KISS, Ángel Roberto Alejandro ESPINOZA</i>	138
The Effect of Emotional Labor on Job Involvement in Preschool Teachers: Verifying the Mediating Effect of Psychological Capital <i>Ching-Sheue FU</i>	145
The Effect of Play Supported Program on the School Readiness of 60-72 Month-Old Disadvantaged Children <i>Özgül POLAT, Ayşegül SÖNMEZ</i>	157

Academic Progress Depending on the Skills and Qualities of Learning in Students of a Business School

Araiza Vázquez María de Jesús

*Universidad Autónoma de Nuevo León (FACPyA), Monterrey, N.L., México
araizav@gmail.com*

Dörfer Claudia

Universidad Autónoma de Nuevo León (FACPyA), Monterrey, N.L., México

Castillo Corpus Rosalinda

Universidad Autónoma de Nuevo León (FACPyA), Monterrey, N.L., México

ABSTRACT

This research was to establish the relationship between qualities of learning; learning skills and academic performance in undergraduate students.

310 undergraduates participated in this research of which 72% are female and 28% male.

All responded Scale Learning Strategies of Roman and Gallego (1994) and Questionnaire Learning Styles of Honey-Alonso (Alonso, Gallego and Honey, 1995), and the management system learning was used to establish the academic performance, from the accumulated average of each participant.

The results indicate that there is no single way of preferred learning, as most participants rated high in two or more attributes. As for learning skills it was identified that 42.6% use coding strategies. In addition, no significant correlation between the variables analyzed was found.

This information demonstrates it is necessary to teach techniques of study to the students, since it seems to be the best route to certify that his learning is the most successful.

Keywords: Learning styles, learning strategies, academic performance, higher education

INTRODUCTION

The growing interest in regards to the procedures and skills of learning is derived from studies of cognitive styles carried out in recent years, authors such as; Lopez and Ballesteros (2003); Troiano, Breitman, and Gete-Alonso, (2004); Belt (2006); Escalante, Linzaga and Escalante (2006); Fortoul, Varela, Avila, Lopez and grandson (2006); Barros (2007); Madrona et to the. (2007) and Herrera (2009) have conducted research that attempt to describe both learning styles and strategies that students from different university programs used to regulate their learning processes. Also, they have formulated hypotheses against the relationship that these variables have the academic performance, the processes of teaching and learning that are used at the University level.

The results obtained by these researchers indicate that the predominant style in college students is the reflective. Furthermore, they found that learning styles where defined by the program in which the students were enrolled in, as well as the area of expertise in which they were registered. This could possibly be related to the contents, methodologies, information and specific requirements of each career.

The above findings implies that the academic performance of undergraduate students, not only depends on the attentional and memory ability of students to retain and recall information, but also seem to require skills and processes involved in their analysis, transformation and application. On this last point, it is necessary for the student to have a quality of learning and with specific learning abilities to learn, favoring a better cognitive performance. It is worth highlighting that the learning conditions are likely to improve and when students are taught according to their own style of learning, they learn more effectively. This situation can ensure high quality teaching and learning processes.

Taking into account that human beings to learn, require different cognitive processes, in the present study the relevance of two of these processes is exposed to ensure academic achievement. These are: the learning style and learning strategies. We will, describe and explain each of the variables tested in this work.

Conditions for learning to take place

Studying the ways in which people perceive, analyze and structure information to learn, includes multiple aspects that can contribute to the understanding of learning processes in humans. While traditional education was considered a particular form of appropriating reality and teaching, at present, cognitive psychology has contributed new knowledge to ensure that, learning processes are successful. In particular, they propose two key concepts for this: styles and learning strategies.

“Learning styles are the cognitive, affective and physiological traits that serve as relatively stable indicators, how students perceive interactions and respond to their learning environments” [“Learning styles are the cognitive, affective, and physiological traits that serve as relatively stable indicators of how learners perceive and respond to their interactions learning environments” (Keefe cited in Alonso y Gallego, 1994, p. 104)]. These traits are evident in the way the subjects organized and outlined their interpretation and its relationships with the contents and information. They are also involved with emotional traits, motivations and expectations that influence learning and physiological traits associated with the biotype and the Biorhythm of the student.

Whenever a student is exposed to a learning task their learning style is revealed, because it defines the way they focus on new and difficult information, how it is processed and how it is saved (Dunn, Dunny Price, 1985); learning style involves different cognitive processes that unfold so that the apprentice can perform tasks that first needs to be learned.

In this regard, it is important to consider that learning styles can promote the processes of acquisition, interpretation and analysis of the information. Because it allows the trainee to approach the contents to be assimilated in different ways, in addition to reorienting their actions towards effective mechanisms for processing information. Learning styles characteristics were described by Revilla (1998), stressing that they are relatively stable, they can be modified according to the situations to which a person is exposed, and serve as a means to facilitate their learning.

Learning styles are classified in accordance with the individual preferences of access to knowledge. One of the best-known classifications is that offered by the Honey Alonso Learning styles questionnaire (Chaea; Alonso, Gallego y Honey, 1995), which defines the following styles:

- Active learning style: based on direct experience and is characterized by being animator, improviser, discoverer, risky and spontaneous.
- Reflective learning style: focused on the observation and collection of data. This style of learning is characterized by being weighted, conscientious, receptive, analytical and patient.
- Theoretical learning style: based on the abstract conceptualization and formation of conclusions, this style of learning is methodical, logical, objective, critical, structured and planned.
- Pragmatic style of learning: focused on active experimentation and search for practical applications. This style of learning is characterized for being an experimenter, direct, realistic and technical.

Skills or learning skills

Cognitive psychology posits the existence of different cognitive processes which allow the processing of the information accessed by a person, such as the processes of acquisition, encoding, storage and retrieval of data. In addition to these processes, the cognitive theories establish that to obtain optimal performance of the cognitive system it is necessary for other metacognitive processes.

(See figure 1). Figure 1. Strategies activated in the information process. Taken from Román y Gallego (1994). From a constructivist definition of learning, it is possible to conceptualize it as a mental operation that involves a series of coordinated cognitive processes that unfold in the individual before the execution of a task or exposure of a problem that must be solved. This is the aim of the individual who is facing the situation through the use of specific learning strategies that will facilitate the process (Ausubel, Novak y Henesian, 1993; Flavell, 1984 y Bandura, 1982; Gagné, 1987). Camarero, Buey y Herrero (2000) defined learning strategies as purposeful activities that are reflected in the four major phases of information processing. This vision, operationalized in The Learning Strategies (ACRA) by Román and Gallego (1994), based on four learning stages experienced when learning:

1. Acquisition Stage.

At this stage the cognitive care process, is essential because it is responsible for selecting, transforming and transporting information from the environment to the sensory register (Román y Gallego, 1994). This phase

includes: (a) attentional strategies, explores the information and fragments depending on the contents of previous knowledge; and (b) strategies of repetition, which have the function to facilitate the transmission of information to the long-term memory, simultaneously using different receptors such as vision, hearing, taste and motor function.

2. Encoding of information Stage.

Facilitates the development and organization of information linking it and giving meanings to generate new mental models. This stage contains strategies of development and organization of new information.

3. Information retrieval Stage.

Responsible for deploying memory search strategies (searches for encodings and indications), strategies for generation of responses (planning and preparation of the written response).

4. Support Stage.

Taking into account that information processing occurs simultaneously with other processes of metacognitive and cognitive which can strengthen, neutralize or impede cognitive functioning, metacognitive strategies such as self-awareness and self-management are therefore activated at this stage, affective strategies (auto instructions, self-control and distracting), social (to regulate social interactions) and motivational (to regulate the learning from the intrinsic motivation extrinsic, and exhaust the person learning experiences).

Academic performance

Currently, academic achievement, as a theoretical construct, is regarded as the product of a school process; your benchmark assessment assumes the achievement or not of some learning objectives. Bahamon (2010) shows that the academic achievement can be understood as the result, which should be, obtained by the student with respect to the goals set out by an academic institution.

Objective assessments are those that investigate the learning of a person from the application of standardized tests, i.e. to offer scores to refer to the academic achievement of a student, according to the performance expected for a population in particular. Meanwhile, educational tests are those constructed by teachers within their work of teaching-learning, which can highlight the achievement of a student from a quantitative or qualitative, rating defined by the teacher.

Taking as a reference the above, this research was aimed to determine whether there is a relationship between the type of learning, learning skills and academic achievement of students of a Bachelor's degree from a business school.

The hypothesis of the study asserts the existence of a statistically significant correlation between types, skills learning and academic achievement of students participating in this work.

METHOD

This study is a non-experimental, quantitative transversal-correlational design (Hernández, Fernández y Baptista, 2006).

Participants

The sampling technique was by convenience (all students of the Faculty of second and third semester had the same opportunity to participate), in which all existing degree programs offered by the school were considered. Subsequently, the number of students per program that were to participate in the study was established, to have a representative sample using the formula $sh=n/N$. Of the total of 1963 students enrolled in the august to december 2013 semester, 310 students participated in the study, between the ages of 17 and 21 years old. From this total, 223 participants were female and 87 were male. Most of them, from families of middle socioeconomic stratum. Participants were part of four careers: (a) Information Technology, (b) Administration, (c) International Business, (d) Accounting.

The only established requirement for inclusion was only students in their second and third semester could participate.

Instruments

Learning Strategies (ACRA; Román y Gallego, 1994).

Auto report instrument that permits quantitatively assessment of learning strategies that take place during the study activity in different phases of acquisition, encoding, retrieval and information support (Nisbet y

Schucksmith cited in Román y Gallego, 1994). It consists of four separate subscales which evaluate the students use; of seven acquisition strategies, thirteen coding strategies, four strategies of information retrieval and nine strategies that support the processing. This scale has adequate psychometric properties. For example, the coefficients of reliability of the ACRA scale, are widely satisfactory for their different subscales. The acquisition subscale obtains a score of 0.77 Cronbach's alpha, 0.93 coding subscale, the subscale of recovery of 0.84 and the 0.85 support subscale (Barca, Peralbo, Marcos, Malmierca y Porto, 2009).

Honey-Alonso Questionnaire Learning Styles (Chaea; Alonso, Gallego y Honey, 1995). Self-reporting that can be applied individually or to groups, consists of 80 items scoring between 0 and 1. This instrument allows to evaluate four learning styles according to individual preference in access to knowledge, which were described above. These are: active, reflective, theoretical style, and pragmatic style of learning.

According to the results reported by Villardón and Yániz (2003) and Vivas (2002), the application of the Chaea in Spanish speaking population obtained indices of reliability suitable for each of the styles. The active style got an alpha of Cronbach of 0.62, the reflective of 0.72, 0.65 theoretician and the pragmatic of 0.58.

Academic performance. It was assessed via the academic performance reporting system offered by the University, on the cumulative average that each student has in the career being studied at the time of the measurement. The rule establishes that this average should be on a scale of 0 to 100, where scores below 70 are considered failing, scores between 70 and 89 are medium, while those equal or over 90 are considered high.

Procedure

The implementation of the instruments was carried out by selecting participants by convenience. A request was sent to the selected group of students via each of their teachers. From which, a visit was made with the participants to give them specific information on the study, as well as the processes of application and citation. The instruments were applied to participants with prior signed informed consent. Administration of the scales was performed in a single session during scheduled class time, with five-minute rest periods between each instrument. Subsequently, the grading of the questionnaires answered by the participants and the processing of the data making use of statistical programme SPSS.21 was carried out. Descriptive statistics and inferential (coefficient of range of Rho Spearman, to define the relationship between the studied variables) were calculated.

RESULTS

The age range of participants was between 17 and 21 years, range that matches the General characteristics of the undergraduate students.

In regards to the type of educational institution in which the participants attended for their post-secondary education, it was found that 244 of them said to have studied at an institution of a public nature. The average academic achievement of participants was 76, which shows that the majority of the participants were categorized as average. The achievement of men and women is within the same midrange, being the minimum cumulative average of 70 and the maximum average of 88. Preferences in the use of learning styles, according to the results obtained by the application of the Chaea, show that the majority of the participants do not make use of a style or type of learning. Thus, it is possible to identify combinations of different styles. In terms of pure styles which arose in the students, this study identified 24.8 per cent use the theoretical style, followed by the active style 19.2% (See figure 1).

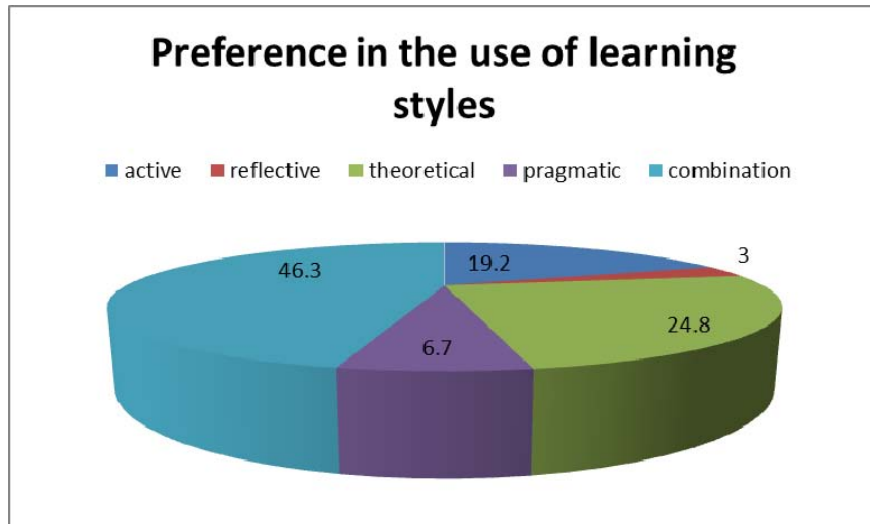


Figure 1. Percentage of preference in the use of learning styles
Source: Own April, 2015

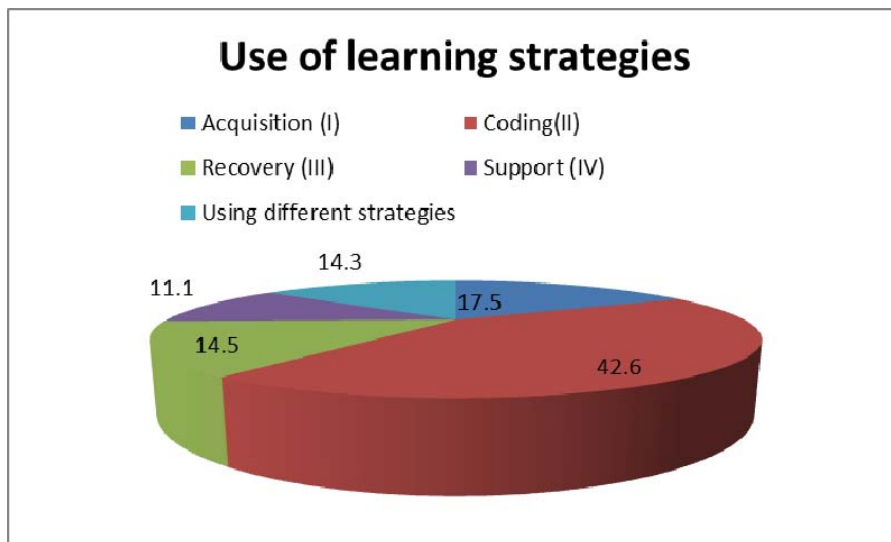


Figure 2. Percentage use of learning strategies
Source: Own April, 2015

About the use of learning strategies, participants registered significantly higher coding subscale, indicating it is common in the students to use skills that help them organize information that are taught at the university, seeking to make sense to new information (see Figure 2). Besides the specific scores, the participants show the use of two or more preferred strategies simultaneously.

However, the scale with the highest score in the ACRA scale coding was followed by acquisition, which has attentional processes to select and transform information coming from the sensory registers. The lowest scores were in the range of recovery, suggesting that students use to a lesser extent processes for deploying skills that facilitate the search for information in memory. The lowest score was presented on the use of support skills, participants indicating that fewer resources to deploy self-knowledge and cognitive, emotional, social and motivational self-learning

About the use of learning strategies, participants registered significantly higher coding subscale, indicating it is common in the students to use skills that help them organize information that are taught at the university, seeking to make sense to new information (see Figure 2). Besides the specific scores, the participants show the use of two or more preferred strategies simultaneously.

Table 1. Learning Skills for academic performance of the participants

	Acquisition strategies			Coding strategies			Recovery strategies			Support strategies		
	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High
<i>Statistical Mean</i>	48.3	53.4	54.4	50.3	64	70.4	41.7	53.3	58.3	28.3	48.0	57.4
<i>S.E.</i>	6.0	1.9	5.1	20.3	1.7	3.9	18.3	1.8	4.3	6.0	1.8	4.4
<i>Median</i>	45.0	60.0	60.0	30.0	70.0	80.0	60.0	55.0	60.0	25.0	50.0	65.0
<i>S.D.</i>	10.4	30.6	34.4	35.2	27.8	26.5	31.8	29.1	29.2	10.4	28.5	30.0
<i>Minimum</i>	40.0	1.0	1.0	30.0	1.0	10.0	5.0	1.0	5.0	20.0	1.0	2.0
<i>Maximum</i>	60.0	99.0	99.0	91.0	99.0	99.0	60.0	99.0	99.0	40.0	99.0	99.0

Source: Own April, 2015

However, the scale with the highest score in the ACRA scale coding was followed by acquisition, which has attentional processes to select and transform information coming from the sensory registers. The lowest scores were in the range of recovery, suggesting that students use to a lesser extent processes for deploying skills that facilitate the search for information in memory. The lowest score was presented on the use of support skills, participants indicating that fewer resources to deploy self-knowledge and cognitive, emotional, social and motivational self-learning

When analyzed together learning skills used by the participants and their academic performance, The study finds that students with high benefit aimed primarily used learning skills in the phase of recovery, which shows that students with averages between 80 to 100 tend to have better planning of study and exam preparation (see Table 1). For their part, students whose academic performance is in the middle range (60 to 79) have a predilection for using learning strategies the acquisition phase. In this case highlights the use of these strategies in charge of exploring the prior information and fragment it to relate to the content of previous knowledge. Meanwhile, Table 2 details the relationship between learning styles and academic achievement level of the students participating in this study

The Analysis of learning styles, depending on the program that enrolled participants to highlight some particular evidence. For example, Information Technology students, often use reflective learning style; in Accounting, students use the pragmatic learning style.

Table 2. Quality of learning vs. academic performance.

	Active			Reflexive			Theoretical			Pragmatic		
	low	Med	high	low	Med	high	low	Med	high	low	Med	high
<i>Statistics Mean</i>	14.7	13.2	12.9	14.7	15.0	15.5	13.3	14.4	14.7	11.0	14.0	14.1
<i>S.E.</i>	1.3	0.2	0.5	0.3	0.2	0.4	1.3	0.2	0.4	3.1	0.2	0.4
<i>Median</i>	16.0	13.0	13.0	15.0	15.0	16.0	12.0	15.0	15.0	13.0	14.0	14.0
<i>S.D.</i>	2.3	2.8	3.2	0.6	3.0	2.5	2.3	2.8	3.0	5.3	2.9	2.9
<i>Minimum</i>	12.0	3.0	4.0	14.0	6.0	10.0	12.0	7.0	7.0	5.0	4.0	8.0
<i>Maximum</i>	16.0	20.0	20.0	15.0	29.0	20.0	16.0	20.0	20.0	15.0	20.0	20.0

Source: Own April, 2015

Finally, to reveal the objective of the current work it was computed: the relationship between the qualities of learning, learning strategies and academic performance. See Table 3. Among the telltale correlations, highlights the relationship between academic achievement and support strategies for cognitive, social, emotional and motivational control, if consider that this scale is the least used by the participants and the academic performance of most students focus on a medium level.

Table 3. Correlations between variables

	Acquisition strategies	Coding strategies	Recovery strategies	Support strategies
Academic Performance	0.12*	0.10	0.13*	0.16**
Active Style	0.029	0.01	0.02	0.01
Reflexive Style	0.20**	0.13*	0.22**	0.22**
Theoretical Style	0.24**	0.16**	0.27**	0.35**
Pragmatic Style	0.21**	0.11*	0.10	0.21**

*p < 0.05, bilateral. **p < 0.01, bilateral

CONCLUSIONS

The results of this study highlight as learning style most used by research participants, theoretical; this suggests that students frequently use abstraction to form conclusions, both methodical and logical level, and seek new learning approach in an objective, critical, structured and planned.

It should be noted that the participants of this research were studying third and second semester of their career, which coincides with the point made by Alonso, Gallego and Honey (1995), Camero, Martin and Herrero (2000), Pujol (2003) and Peinado (2007) who state that: in the first semesters in university, the predominance of pragmatic or theoretical learning styles.

Meanwhile, the lowest style called on students was reflective, which means that few people working under pressure or mandatory deadlines, research, work carefully, be responsive and meet the new analytical information offered in training careers

Moreover, data collected with CHAEA show that most participants do not use one style or learning mode, making it possible to identify combinations of different styles, suggesting some multimodality in student performance when making processes to acquire new knowledge and learn

While it is true that learning styles are patterns of behavior, they are usually not fixed, predetermined, however, they may change depending on the situation of learning and experience that is acquiring the apprentice. As for the transformation of these, research shows that students modify their learning styles to the extent that advances in his studies, which could show a process of cognitive adaptation to university life and teaching strategies used by educators. Accordingly, it is important that students be taught to identify their own style to mobilize effective learning (Revilla, 1998). As for learning strategies, which are understood as purposeful activities are reflected in the four major stages of processing new information (acquisition, encoding, recovery and support), we find that the students of this institution indicate significantly higher in using two or more strategies, often used simultaneously when studying. This means that students have evaluated more complex processes for the acquisition and interpretation of the information and the simultaneous use of different strategies expose a fortress student while more resources have to face learning tasks. However, the highest scores were obtained for coding strategies, except for students Accounting program (notably the use of procurement strategies) and Management and International Business (highlighting the use of strategies, recovery). This indicates that it is common to use processes that contribute to the organization and processing of information by establishing different structures for data processing in order to make sense of new information, a question that may be associated with the competencies required in these careers as demanding pragmatic skills for their professional performance.

The data collected in this study suggest that participants use a theoretical learning style learning strategies often employ encryption, reaching an average academic achievement (between 70-79). This information is consistent with academic averages of the participants, and the scientific literature suggests that in order to obtain a high performance, students should use mainly support strategies (Roman and Gallego, 1994).

In summary, the results of this research show the need for an explicit and systematic teaching of learning strategies and / or study skills imparted to students, as seems to be the best way to ensure that learning is most successful.

That is, the academic programs should not only focus on providing the technical content of their discipline, they should also strive to teach students how to efficiently acquire this knowledge. This proposal should include training teachers on how to teach their students to have better learning strategies considering their learning styles, so that they can include didactic elements that promote student learning.

Future studies should seek to broaden the sample to include students of all careers or the whole university and even other universities, studying in public schools.

REFERENCES

- Alonso, C. M. y Gallego, D. J. (1994). Estilos individuales de aprendizaje: implicaciones en la conducta vocacional. En F. Rivas (Ed.), *Manual de asesoramiento y orientación vocacional*. Madrid: Síntesis.
- Alonso, C. M., Gallego, D.L. y Honey, P. (1995). *Los estilos de aprendizaje: Procedimientos de diagnóstico y mejora*. Bilbao: Ediciones Mensajero.
- Ausubel, D., Novak, J. y Henesian, H. (1993). *Psicología Educativa. Un Punto de vista cognoscitivo*. México: Trillas.

- Bahamón, M. (2010). Relaciones existentes entre sistema de mediación del aprendizaje, autorregulación del aprendizaje y logro académico en estudiantes de pregrado de una universidad de Pereira. *Revista Psicología Científica*, 12(22). Recuperado de <http://www.psicologiacientifica.com/relaciones-sistemade%20mediaci%C3%B3n-aprendizaje-autorregulacionlogro-acad%C3%A9mico>
- Bandura, A. (1982). *Teoría del aprendizaje social*. Madrid: Espasa-Calpe.
- Barca, A., Peralbo, M., Marcos, J., Malmierca, F. y Porto, A. (2009). Estrategias cognitivas y metas académicas: sus efectos en los estilos de aprendizaje. *Revista Actas do X Congresso Internacional Galego-Português de Psicopedagogia*, 35, 4342-4369. Recuperado de <http://www.educacion.udc.es/grupos/gipdae/congreso/Xcongreso/pdfs/t9/t9c323.pdf>
- Barros, A. (2007). Estrategias de aprendizaje en las matemáticas que emplean los estudiantes universitarios. *Revista Perspectiva Psicológica*, 9, 7-51. Recuperado de www.umanizales.edu.co/programs/psicologia/Perspectiva/REVISTA%209/estrategiasdeaprendizaje.pdf/es
- Camarero F., Martín F. y Herrero. J. (2000). Estilos y estrategias de aprendizaje en estudiantes universitarios. *Psicothema*, 12(4), 615-622.
- Correa, J. (2006). Identificación de los estilos de aprendizaje en los estudiantes de Fisiología del Ejercicio de la Facultad de Rehabilitación y Desarrollo Humano. *Revista Ciencias de la Salud*, 4, 41-53.
- Dunn, R., Dunn, K. y Price, G. (1985). Manual: Learning Style Inventory. Lawrence, Kansas: Price Systems.
- Escalante, E. Linzaga, E. y Escalante, E. (2006). Los estilos de aprendizaje de los alumnos del CEPCSaegro. *Revista Iberoamericana de Educación*, 41(1), 6-15. Recuperado de <http://dialnet.unirioja.es/servlet/articulo?codigo=2169153>
- Flavell, J. (1984). *El desarrollo cognitivo*. Madrid: Visor.
- Fortoul, I. T., Varela, R. M., Ávila, C. M., López, M. S. y Nieto, M. D. (2006). Factores que influyen en los estilos de aprendizaje en el estudiante de Medicina. *Revista de la Educación Superior*, 35(2), 55-62. Recuperado de http://www.anuies.mx/servicios/p_anuies/publicaciones/revsup/pdf/RES_138.pdf
- Gagné, R. (1987). *Las condiciones del aprendizaje*. México: Interamericana.
- Hernández, R., Fernández, C. y Baptista P. (2006). *Metodología de la investigación* (4ª ed.). México: McGraw Hill.
- Herrera, L. (2009). Estrategias de aprendizaje en estudiantes universitarios. Un aporte a la construcción del Espacio europeo de educación superior. *Educación y Educadores*, 12(3), 75-98.
- López, C. y Ballesteros, C. (2003). Evaluación de los estilos de aprendizaje en estudiantes de Enfermería, mediante el cuestionario Chaea. *Revista Enfermería Global*, 2(3), 1-12. Recuperado de <http://revistas.um.es/eglobal/article/view/626/652>
- Madrona, P., Contreras, O., Pastor, J., Gómez, I., González, E., García, L., De Moya, M. y López, A. (2007). Estilos de aprendizaje de los estudiantes de Magisterio: Especial consideración de los alumnos de Educación Física. *Revista de Curriculum y Formación Profesorado*, 11(2), 1-19. Recuperado de <http://www.ugr.es/~recfpro/rev112ART8.pdf>
- Pujol, L. (2003, Noviembre). *Efecto en la conducta de búsqueda de información precisa en hipermedios de dos variables personales: estilos de aprendizaje y uso de estrategias metacognitivas en estudiantes universitarios*. Documento presentado en el Congreso Internacional Edutec 2003: Gestión de las Tecnologías de la Información y la Comunicación en los Diferentes Ámbitos Educativos. Caracas, Venezuela. Recuperado de http://gte.uib.es/cd_edutec2003/ponencias/72.doc.
- Revilla, D. (1998) “*Estilos de aprendizaje*”, *Temas de Educación*. Segundo Seminario Virtual del Departamento de Educación de la Pontificia Universidad Católica del Perú. Recuperado de <http://www.pucp.edu.pe/~temas/estilos.html>
- Román, S. y Gallego, R. (1994). *Escala de estrategias de aprendizaje*. Madrid: Editorial PSEA.
- Troiano, H. Breitman, M. y Gete-Alonso, C. (2004). Estilos de aprendizaje que predominan entre los estudiantes universitarios. *Revista de Enseñanza Universitaria*, 23, 63-84.
- Villardón, L. y Yániz, C. (2003). *Efectos del aprendizaje cooperativo en los estilos de aprendizaje y otras variables* (Tesis doctoral). Universitat Politècnica de Catalunya, UPC. Recuperado de [http://giac.upc.es/PAG/giac_cas/GIAC_JAC/03/L%20VILLARDON\(formAT3\)\(11\).htm](http://giac.upc.es/PAG/giac_cas/GIAC_JAC/03/L%20VILLARDON(formAT3)(11).htm)
- Vivas, M. (2002). Algunas derivaciones didácticas a partir del diagnóstico de los estilos de aprendizaje de los alumnos. *Revista. Ágora*, 5(9), 35-55.

Assessing ELT Pre-Service Teachers via Web 2.0 Tools: Perceptions toward Traditional, Online and Alternative Assessment

Nazlı Ceren Cirit

*Department of Foreign Language Education, Hasan Ali Yücel Faculty of Education, Turkey
cerencirit@gmail.com*

ABSTRACT

The purpose of this study is to investigate the perceptions of the ELT pre-service teachers toward the traditional, alternative, and online assessment methods and examine whether the participants' attitudes change toward the types of assessment after the tasks via Web 2.0 tools are implemented. In the light of these aims, the study was conducted with 40 second grade ELT pre-service teachers at a state university in the fall semester of 2013-2014 academic year. The study was conducted in a fourteen week period in which 6 different tasks with 7 different Web 2.0 tools were implemented. The data for this study were collected through pre-survey before the implementation, reflection papers during the implementation, and post-survey and semi structured in-depth interviews after the implementation of the tasks. The findings of the study indicated that the perceptions of the participants toward the alternative assessment via web 2.0 tools were positive before the tasks were implemented and it got more positive after the task implementation process. In general, the participants preferred alternative assessment to online or traditional assessment since they believed alternative assessment is motivating, enhances learning, provides continuous assessment of student progress, increases interaction, gives more detailed and practical feedback, and improves critical thinking skills. The results of both qualitative and quantitative data supported each other.

Keywords: ELT pre-service teachers, alternative assessment, Web 2.0 tools

INTRODUCTION

The rapid expansion of technology in people's everyday life led the educators to integrate technology into education for instructional and assessment purposes. For an English as a Foreign Language (EFL) teaching method to be successful, it needs to be learner centered, motivate and encourage the students, address the variety of students and assess all the skills of the language in balance, in which the traditional assessment methods cannot succeed. As a result of the growing increase in the dissatisfaction of the traditional assessment methods, alternative assessment methods such as portfolios, self- and peer-assessment, projects are seen as effective in accomplishing the goals of language teaching that the traditional assessment cannot. In the last few decades, language teacher education programs have started to search for a language teaching theory which is more practical based on observations, practice teaching, and curriculum and materials development to fit themselves into the appropriate place in the digital age (Crandall, 2000). However, the lack of the teacher training especially in technology integration presents the portrayal of inexperienced and unqualified teachers who do not know how to make use of technology to improve the language development of their students.

Even though the teacher education programs are facing the challenges of benefiting from web 2.0 tools, which are web applications on the internet, to enhance language learning, the number of the web 2.0 tools and the scope of its use in the world is expanding rapidly, which makes it harder for the teachers to resist its wider use in their own classes. Albion (2008) indicated that it is significant for the teacher educators to realize the educational potential of the web 2.0 and they need to benefit from it to enhance language learning and prepare their graduates so that they can apply web 2.0 in their future careers. Seeing that in the literature the studies are rare on alternative assessment related to the performance of the students but just includes the studies reflecting the perceptions of teachers or students and even less common in Turkey, the present study was seen as a necessity to enlighten what the pre-service teachers think about the integration of web 2.0 tools to their classes for the purpose of alternative assessment after they practiced the tasks via web 2.0 tools in a course that they were offered. Therefore, this study investigates the perceptions of the ELT pre-service teachers toward traditional, alternative and online assessment. In addition, this study examines how much the ELT pre-service teachers' attitudes change toward traditional, alternative and online assessments after being assessed via Web 2.0 tools.

For this reason, in this study, answers to the following questions are explored:

1. What are the perceptions of the ELT pre-service teachers toward the types of assessment: traditional, alternative and online?
2. To what extent do the ELT pre-service teachers' attitudes change toward traditional, alternative and online assessments after being assessed via Web 2.0 tools?

REVIEW OF LITERATURE

With the rapid expansion of instructional technology in education, the roles of the 21st century teachers and students have differed from those of the past in having the technological literacy. For this reason, the teachers are supposed to adapt a curriculum which provides real-world technology-rich experiences and authentic assessment (Warner, Steffen, & Cope 2011). To do this, the central role of the teacher needs to be equipped with related knowledge and skills to pursue its place in today's technologically advanced language classrooms. Therefore, the more knowledgeable teachers are in the educational technology, the better they can address the challenges of the gradual increase in student knowledge and skills. In the employment process, among the conditions of the job postings, the experience with educational technology has already taken its place. However, Kessler (2006) stated that the graduates of the formal language teacher education programs do not seem like having gained the necessary knowledge and skills related to instructional technology since these programs disregarded to include the instructional technology courses to their curriculums. Crandall (2000) also mentioned that language teacher education programs have not been successful in guiding the teachers to adapt the requirements of the modern classroom environment. Since most of today's pre-service teachers are the regular users of the network-based technology and accustomed to be in a mass media-dependent environment, the goal of the teacher education programs should be to teach pre-service teachers how to use technology in their classes for teaching and assessment purposes.

So far almost every educated person was assessed by the traditional methods in his/her life a few times. As mentioned by many researchers repetitively, Balliro (1993) also indicated the dissatisfaction with the traditional assessment methods by stating that the traditional assessment methods remain incapable of sufficiently representing the learner strengths and true progress. Since the traditional assessment methods do not fit well with the current English language learning practices, searching for the alternative ways of assessing the students were imperative. With the need to support student learning by including students' voices and giving them the opportunity to share the decision making process in their own learning and assessment, the pursuit of alternative assessment methods arose. Barootchi and Keshavarz (2002) suggested that alternative assessment known also as nontraditional assessment is used like an umbrella term for the types of assessment except for anything other than standardized, traditional tests. Highlighting that the alternative assessment methods came out as a contrast to the traditional assessment methods, what Bailey (1998) mentioned is that the traditional assessment methods are one-shot, indirect and inauthentic while alternative assessment methods are continuous, longitudinal, direct and authentic assessments. Unlike the traditional assessment methods which dictated the students the existence of one right answer, the alternative methods encourage the students to explore the possibilities by drawing on their own inferences. The instructors could gather information on their students' abilities, talents, interests, potentials since alternative methods are capable of reflecting students' performance in educational settings (Barootchi & Keshavarz, 2002). Among the alternative assessment procedures, checklists of student behaviors or products, journals, reading logs, videos of role plays, audiotapes of discussions, self-evaluation questionnaires, work samples, and teacher observations or anecdotal records take place. The constant changes from the traditional assessment toward alternative assessment were summarized by Herman et al. (1992) as follows:

- From behavioral to cognitive views of learning and assessment
- From paper-pencil to authentic assessment
- Portfolios: from single occasion assessment to samples over time
- From single attribute to multi-dimensional assessments
- From near exclusive emphasis on individual assessment to group assessment (p.13)

To fulfill the requirements of these procedures and gain principal skills like critical thinking, problem solving, communication and collaboration indispensable for all types of learners, especially for language learners could be developed with the Web 2.0 practices since students are given the opportunity for active participation and multi-way communication through the authentic and meaningful materials provided by the Web 2.0 technologies. Since learning a second language requires the development of the all four skills, namely listening, reading, speaking and writing, designing assessments with the integration of technology can fulfill what the traditional assessments cannot by motivating the learners and supporting their learning with the sources reached by means of the Web 2.0 tools.

The new generation of web-based technologies, Web 2.0 was first coined as an invented term in 2005 and described by Tim O'Reilly (2007) as "a set of principles and practices that tie together a veritable solar system of sites that demonstrate some or all of those principles, at a varying distance from that core" (p.18-19). With the Web 2.0 tools, learning can be enhanced since each piece of information on the Web is connected to one another via hyperlinks, which helps students to learn something new as they keep digging (Solomon and Schrum, 2007). The instructors can even invite experts from far end of the world to their classes as a guest speaker and these experts could present a topic, attend a class discussion or just answer the questions through web conferencing

and online chat options. The need of reaching the professional sources to enhance learning and as its natural outcome to adapt online assessment trends, especially the language teachers should be guided on how to implement online assessment methods with authentic, communicative, multicultural and pedagogically appropriate materials. Therefore, as the integration of the Web 2.0 practices into education for instructional and assessment purposes has a recent history, the specific guidelines and detailed and clear pedagogical strategies are needed. Ching and Hsu (2011) also argued that the Web 2.0 practices should be purposefully designed for instruction and assessment; otherwise, the practices with Web 2.0 technologies would not fulfill their job. Since today's instructors are 'digital immigrants' and the students 'digital natives' when mentioned with Prensky (2001)'s words, the instructors had better learn how to adapt their classes what technology offers, to grab the attention of the students and make up for the generation gap. Realizing the urgent need of keeping up with the skills of the 21st century students, Gray et al. (2012) accepted the fact that there is still a lot to do before feeling confident in adapting a reliable, fair engaging and substantial assessment with the use of Web 2.0. If the research conducted so far related to the integration of Web 2.0 tools for the assessment purposes in ELT is exemplified, Cephe and Balçıklı (2012), in their study exploring the beliefs of the student teachers from an ELT program in Turkey, found out that web 2.0 technologies facilitate interaction and collaboration, provide chances for learning other than class hours considering that especially the language learners spend their time mostly on online language learning tasks, boost motivation, participation and student involvement in the learning process, raise the digital literacy awareness and help student teachers with their future career by expanding their professional repertoire. This study was found necessary since in the literature, even though the perceptions of the pre-service teachers on the technology integration were investigated; their perceptions when they practiced these technologies were not reflected. In another study based on the in-service teachers' practice of the web technologies, Oliver (2007) stated that the participants mentioned the practice with web technologies were useful in a way that they make students spend their time learning on the Internet, discover numerous resources while searching the topic of the assignment, connect ideas, and organize sources and strategies. Moreover, Gray et al. (2012) explored the Australian academics' assessment of students' web 2.0 activities. The results suggested that other than a few challenges and risks, the academics generally found the assessment with web 2.0 tools necessary and valuable. In another study conducted by Göktürk-Sağlam and Sert (2012), perceptions of the ELT instructors toward the use of technology in language teaching were investigated. According to the results, the participants were in favor of technology in language learning environment. The participants were inclined to consider the gap between 'the digital natives' the students and the 'digital immigrants' the teachers themselves; therefore, they approved the integration of technology as it is hard to ignore the fact that students spend most of their time outside the class on the Internet. The disadvantages of technology integration indicated by the participants were mostly related to the technical difficulties and inaccessibility of technology. Kumar and Vigil (2010); on the other hand, examined pre-service teachers' perspectives on the use of web 2.0 technologies in teacher education courses. This study is crucial in providing insight on how to prepare the pre-service teachers for the digital age where the students are all digital natives since it helps understanding the perspectives, needs and practices of pre-service teachers better. The results suggested that the participants believed these technologies can be valuable in their own courses and their professional career. In addition, Ishtaiwa and Dukmak (2013)'s study revealed that ELT pre-service teachers expressed that web 2.0 tools enhanced learning after they experienced the use of blog and wiki in the course they took. They believed web 2.0 tools help them to learn in collaboration, interact with each other, share what they know and have done together with developing reflective and critical thinking skills.

The studies cited above on the integration of Web 2.0 technologies into the classrooms mostly focus on revealing the perspectives of either the students or the pre-service teachers. Even though finding out the perspectives of the pre-service teachers and students are significant, it is important to discover the opinions after practicing the web 2.0 technologies in the classroom with participants and observing their reactions and finding out their ideas afterwards since the literature misses the relevant research conducted with real classroom practice. Hence, the present study investigates the perceptions of the participants by comparing their opinions before and after the implementation of tasks through web 2.0 tools.

METHODOLOGY

Setting and Participants

The study was conducted at the English Language Teaching (ELT) department of Istanbul University because of its convenience for the researcher. The data for this study was obtained from the undergraduate students who take the must course "ELT Methods I" offered during the first semester of the second year. From the 115 students who were taking the course "ELT Methods I" in the fall semester of 2013-2014 academic year, the data collected from 40 students were used for this study since these 40 students have fulfilled almost all the requirements of the study. While the 35 of the students have done all the requirements, 5 of them completed all five tasks except one task. The participants were numbered from 1 to 40 (e.g. P1 for Participant 1). The reason

for including only the students who have attempted almost all the requirements is that the post-survey used for this study were asking for comparison among the tasks after they had been implemented in the course “ELT Methods I” and if the students did not do all of the tasks, they wouldn’t be in a position to compare the tasks with one another. Therefore, the researcher needed to exclude the 75 students from the study who did not attempt more than four of the tasks.

Data Collection Instruments

For the present study, four data collection instruments were used: a pre-survey, reflection papers, a post-survey, and a semi-structured in-depth interview. The pre-survey designed for revealing the attitudes of the participants toward assessment and technology was conducted at the beginning of the term before the researcher started to assign the tasks. The reflection papers were collected from the participants right after each task. The post survey was implemented after the participants had submitted all the tasks. The in-depth interviews were conducted one week after the post-survey was conducted which was the end of the term.

Data Collection Procedures

The study was conducted in the course “ELT Methods I” which is offered during the first term of the second year of the ELT Department. After the pre-survey was given at the beginning of the term to the participants, 6 different tasks via 7 different web 2.0 tools designed for the study were implemented in the 14 week period of the term. Before the tasks were implemented, the pre-service teachers taking the course “ELT Methods I” were clearly informed that the data gathered from the tasks would be used for the study that the researcher conducted. Additively, the researcher stated that although not completing the tasks and reflection papers would impact their overall grade, the participants neither have to fill in the pre- and post-survey nor participate in the interviews. By this way, the students were given chance to fulfill their responsibilities just for the course but not participate in the study. The number of the tasks was arranged considering the weeks that the course instructor is planning to integrate a task.

After the data was collected through pre-survey, the researcher started to assign the tasks. Among the materials designed for each task, a guideline, rubric, sample task, reflection paper has been introduced in class and uploaded to “Edmodo” after the class hour (see sample student copy of a task with a Web 2.0 tool “Glogster” in Appendix A and see a sample rubric in Appendix B). All the materials used for the tasks and the tasks themselves were designed by the researcher. Edmodo which is an educational platform, was used for uploading and downloading task materials and contacting the course instructor or the other pre-service teachers. The tasks and the web 2.0 tools used in each task were displayed in the table below:

Table 1: The tasks and the web 2.0 tools used in each task

Task	Web 2.0 tool
Task 1 – Answering the reflective question by recording your voice for the avatar you designed	Voki
Task 2 – Preparing a quiz	Testmoz
Task 3 – Preparing a mindmap	Mindomo
Task 4 – Designing a classroom activity	Facebook
Task 5 – Designing a poster	Glogster
Task 6 – Preparing a presentation and video	Prezi & Screencast-O-Matic

The pre-service teachers were clearly stated what was expected of them in each task, how they would be assessed, what attainments they would have at the end of each task. Right after each task, the participants were supposed to submit a reflection paper which is one of the data collection instruments designed for the present study. When the task implementation process was over, the participants were given the post-surveys. As the last data collection instrument, the semi-structured in-depth interviews were conducted with the participants who volunteered. In brief, the data for this study were collected through pre-survey before the implementation, reflection papers during the implementation, and post-survey and semi structured in-depth interviews after the implementation of the tasks.

Data Analysis Methods

In this study both qualitative and quantitative data were gathered and analyzed; therefore, the results of a mixed method research is presented. The qualitative data was collected via open-ended questions in the pre- and post-surveys, reflection papers and semi structured in-depth interviews. To analyze the qualitative data, a qualitative data analysis method, constant comparative method was used. The responses of the participants to the open-ended questions in the pre-surveys, post-surveys and reflection papers were translated into English and categorized. The data collected via the interviews were first transcribed, translated into English and categorized.

The quantitative data collected from the pre-surveys, post-surveys and reflection papers were statistically analyzed using the program Statistical Package for the Social Sciences (SPSS), version 20.0. The analysis of the data gathered from the reflection papers were made by running an ANOVA test.

RESULTS AND DISCUSSION

The findings of the study revealed that almost all the participants (between 82,5% and 92,5%) had never used the web 2.0 tools, which were planned to be used for the tasks of the study, to get grades in a course. Most of the participants (87,50%) did not take any courses in instructional technology before and only 10% of the participants took part in online assessment before. This shows that most of the participants were neither experienced in instructional technology nor being assessed online.

According to the results obtained from the pre-survey, even though almost all the participants are not experienced in instructional technology or familiar with online assessment, the general attitude of the participants toward the integration of technology into education is positive with the mean of 3,103. The majority of the participants stated that the use of technology in their courses motivates them (n=32); therefore, technology should be integrated to their lessons more (n=38). Except for only one participant, all the participants (n=39) believe that they learn better if they can practice what they have learned in class with the help of multimedia. Additively, most of the participants (n=32) believe that sharing materials online is fun, they (n=36) prefer seeing more examples of the use of technology in their English classes, and the use of technology improves their success (n=36). Most importantly, since the participants are ELT students, they (n=37) stated that they would like to use technology to teach English when they become full-time English teachers.

In the pre-survey, when the participants were asked whether they had written a reflection paper before which was planned to be used to collect data for the present study as part of the alternative assessment of the participants, almost half of the participants indicated that they had written reflection papers before. In the post-survey, a sub-section was spared to reveal the participants' perceptions toward the reflection papers after they wrote reflection papers for each task during the data collection process. The findings indicated that most of the participants (n=32) believed in the effectiveness of the reflection papers by stating that reflection paper is a nice way of having their voice heard by the instructors when they need, helped them to improve their critical thinking skills, and made them realize what they had done so far. However, the number of the participants (n=17) who did not believe in the usefulness of the reflection papers is high enough to take into consideration. Therefore, the number of the participants who supported the use of reflection papers in their courses outnumber that of the participants who did not want the reflection papers to be used in their other courses; it is possible to deduce that most of the participants reflected a positive attitude toward the use of reflection papers for educational purposes as the mean of general attitude, 2,972 indicates. Since the reflection papers are part of the alternative assessment, it is understood that the participants support the use of alternative ways of assessment by their instructors.

In pre-survey, the participants were asked to state their perceptions toward technology in education before they were assigned to the tasks. In almost all the questions, the participants showed a highly positive attitude toward the use of technology in education with the mean of general attitude, 3,103. The majority of the participants stated that the use of technology in their courses motivates them (n=32); therefore, technology should be integrated to their lessons more (n=38). Except for only one participant, all the participants (n=39) believe that they learn better if they can practice what they have learned in class with the help of multimedia. Additively, most of the participants (n=32) believe that sharing materials online is fun, they (n=36) prefer seeing more examples of the use of technology in their English classes, and the use of technology improves their success (n=36). Most importantly, since the participants are ELT students, they (n=37) stated that they would like to use technology to teach English when they become full-time English teachers. The results indicate that the idea of involving technology in education was favored by the participants before the tasks with Web 2.0 tools were implemented. The same part asking for the perceptions of the participants toward technology in education was included in the post-survey as well to compare whether any attitude differences occur after the tasks with web 2.0 tools were implemented. The analysis of the participants' responses showed that the mean of the general attitude is 3,150 which is a bit higher than that of the pre-survey. Specifically, the analysis of one of the items show that the mean value of the post-survey (m=2,950) was higher than the pre-survey (m=2,675), which means the participants now use the Web 2.0 tools (wikis, blogs, social networking sites etc.) more actively in their daily activities after the task implementation process. Overall, it is seen that even if in both of the surveys the participants had a positive attitude toward technology, in the post-survey the participants had a more positive attitude toward the use of technology after the task implementation.

In both pre- and post-survey, a section was designed to reveal the participants' attitudes toward the assessment types. Below, the results of the analysis were summarized under separate headlines according to each assessment type:

Traditional assessment:

The analysis shows that in pre-survey the mean value was 2,223 while in post-survey the mean was 2,123, which clarifies that the participants had a negative attitude toward the use of traditional assessment in both pre- and post-surveys. In post survey, since the mean value is lower than that of pre-survey, it can be said that in post-survey, the participants' attitude got more negative after the tasks were implemented. Therefore, according to the items in the surveys, it can be said that the participants feel under pressure when they have to take the midterms and the finals in class, they believe traditional assessment methods cannot assess practical skills or application of knowledge, the traditional assessment methods are not enough to assess team or collaborative learning, and the traditional assessment methods do not pay attention to the individual needs and interests of the students.

Alternative assessment:

The participants' responses indicate that the general mean was 3,083 in the pre-survey while it was 3,212 in the post-survey. This makes it clear that the participants took a positive attitude toward the use of alternative assessment in both pre- and post-surveys. Considering the items in the surveys, the participants believe alternative assessment methods helped them to become a more autonomous learner after the tasks were implemented, they think self-assessment through reflecting on their work and peer-assessment is useful in their courses, they prefer to be assessed by a series of tasks throughout the semester instead of being assessed by just a midterm and a final, they believe they are more motivated by the alternative assessment methods, they support the idea that alternative assessment methods provide authentic and continuous assessment of students' progress, they think in alternative assessment methods students get more detailed and practical feedback compared to traditional assessment methods, they agree that alternative assessment methods provide students the opportunity to interact with their teachers and classmates during the teaching/learning process and they indicate that alternative assessment methods improve their critical thinking skills more than traditional assessment methods. Since the mean value of the post-survey came out higher than the pre-survey, it can be said the participants support the idea more than they supported in the pre-survey that alternative assessment methods helped them to improve themselves more than traditional assessment methods did. However, there is still a point which needs to be highlighted that among the items in the surveys, the item which has the highest mean reveals that the participants believed both traditional and alternative assessment methods should be used in combination in a course (mean in pre-survey: 3,425 and in post survey: 3,375), which shows us that even though the participants are criticizing the traditional assessment methods in some negative aspects, the participants think that using both traditional and assessment methods together would better assess a students' performance since both methods have their own strengths and weaknesses.

Online assessment:

The analysis reveals that the general mean of pre-survey is 2,762 while the general mean of the post-survey is 2,983, which shows that the participants had a positive attitude toward the use of online assessment in both pre- and post-surveys. Nevertheless, since the general mean of post-survey is higher than the pre-survey, it can be said that after the task implementation, the participants showed a more positive attitude toward the use online assessment methods. Still, one of the items to which the participants' attitude differs in pre-and post-survey reveal that while the participants did not take a positive attitude toward being assessed by the use of technology instead of paper-based tests in the pre-survey, they supported being assessed via technology in the post-survey. Comparing the mean values, it is also possible to say that in post-survey the mean value is higher than that of pre-survey, which means in post-survey, the participants prefer to receive private online feedback instead of getting it in front of their classmates much more than they did in the pre-survey. Also, the participants supported the statement in the post-survey that online assessment methods can assess specific skills in English through computer-based testing better than other assessment methods even though they did not believe in this idea in the pre-survey. In addition, the participants agreed much more than they did in the pre-survey that it is better to be assessed online because the teachers can appeal to different types of learners. The participants also supported the statement in both pre- and post-surveys that online assessment is helpful because teachers and learners do not have to be in the same physical place. Especially in the post-survey, the participants showed a highly positive attitude toward the statements that online assessment is more suitable to assess English language and teaching skills and online assessment can provide authentic tools that other assessment methods cannot provide in English methodology courses. Most importantly, the participants agreed to the item that they would like to use online assessment methods in their English courses when they graduate and become a teacher.

In both pre- and post-surveys, an open ended question ‘Which one of the following assessments do you prefer as a student in your methodology courses? Why?’ was asked. To give an answer to this open-ended question, the participants needed to choose the assessment method they prefer among the given three types of assessment methods presented in figure 1 below. Then, they explained their reasons for their choice. The comparison of the participants’ answers to this open ended question before and after the task implementation process was made.

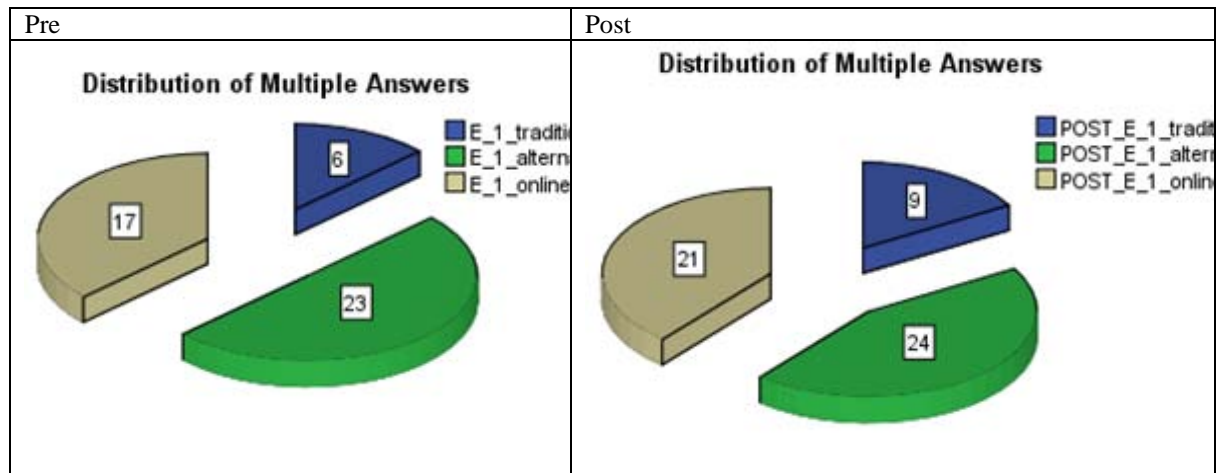


Figure 1: Comparison of participants’ assessment type choice in pre- and post-survey

The analysis shows that since there are 40 participants in the present study, it is understood that some of the participants made more than one choice in both of the surveys. As a result, it can be said that the responses of the participants did not present much difference after the task implementation process. Still, most of the people preferred to be assessed by the alternative assessment methods in both pre- and post-surveys while the number of people supporting the traditional assessment methods is the lowest in the post-survey just like it was in the pre-survey. Therefore, the reason why the comparison in this section was made is to see how many people there are who support the use of more than one assessment type among all the responses and what choices they made. In the end, semi-structured in-depth interviews were conducted with the four participants who fulfilled all the requirements of the data collection process including the pre-survey, tasks, reflection papers and post-survey. The interview was composed of 5 main categories and in one of them the participants were asked questions which requires the participants to compare traditional and online assessment methods. The responses of the participants show that they believe they cannot reflect their performance very well in the traditional exams since they feel stressed. Therefore, they get low grades from the exams even if they know the answers of the questions. However, while doing the online tasks, they feel comfortable so they can express themselves better or they can go back and fix their mistakes before they submit their tasks to the instructor. That’s why, the participants believed online assessment is fairer. The participants also added that integrating technology increased the quality of the lessons, online assessment provided opportunities to both the students and the teachers, Edmodo and the reflection papers improved the communication between the teachers and students. The representative responses of the participants are given below:

Thanks to the tasks, we could express our knowledge without being under the pressure of the time. In addition, knowing these tasks is like an investment for the future since we are going to be teachers. As students, we had chance to be assessed fairly, we could make up for a mistake. The tasks also provided us a more flexible and comfortable environment (P4, 07/01/2014).

Since we had the chance to see our classmates’ tasks by just clicking on their tasks’ links, we can compare theirs with our own tasks and we can improve our task. By this way, we can learn from each other and improve ourselves (P3, 30/12/2013).

Using a social platform for our own class is definitely necessary since it gives us chance to follow the course even if we were absent during the class hours. We can see the materials and learn our assignments. It is an advantage to be able to submit the assignment even if you did not attend the lesson. Also, it is sometimes difficult to find the teacher in his/her office. Instead, we can communicate with our teacher via Edmodo much faster. Besides, when a student asks a question, everybody can see the teacher’ answer (P4, 07/01/2014).

Reflection papers were helpful for both the teachers and the students. They helped us to express our ideas about the tasks and realize the tasks' positive and negative sides which will be helpful for us in the future. In addition, you had ideas on how to fix the tasks and improve them since you learned how we felt about the tasks (P2, 31/12/2013).

The results of the pre-survey reveal that almost all the participants did not benefit from the web 2.0 tools that were used in the present study to get grades in a course before. Let alone these web 2.0 tools, one out of ten students took part in the online assessment before the present study which is clearly very low. Considering this background of the students in relation to assessment via technology, naturally they were not aware of the merits and demerits of the online assessment. However, they were obviously aware of the disadvantages of the traditional assessment since they had been tested by the traditional methods for years. Related to the traditional methods, in the pre-survey, the participants complained about feeling under pressure during the midterm and final weeks. In addition, they indicated that the traditional assessment methods do not allow students to present their real performance and give importance to the needs and interests of the students. However, there were still almost half of the participants who preferred traditional assessment methods to projects or take-home exams in the pre-survey. The results of the post-survey were in the same direction with the pre-survey except that the attitudes of the participants revealed a more negative attitude in the post-survey toward the traditional methods (General attitude: pre-survey, 2,223; post-survey, 2,123). As pre-service teachers, majority of the participants indicated in the post-survey that they would not assess their students in traditional ways when they become a full-time EFL teacher even though there were still 15 participants who would. This shows that even though the participants disapprove the traditional assessment more than before, there are still some participants who did not change their ideas and kept supporting the traditional assessment methods even after they did the tasks.

In relation to the alternative assessment methods, in the pre-survey, the participants supported each and every statement that encourages the use of alternative assessment. Almost all the participants believed that self and peer assessment contributed to their learning and alternative assessment methods made them feel more competent and autonomous. However, in the pre-survey, almost all the participants made it clear that the traditional methods should not be completely abolished but combined with the alternative methods. In the post-survey, the participants' attitudes got more positive but still even much more participants were willing to see the implementation of alternative assessment together with traditional assessment. This clearly proves that the participants benefited from the tasks but they still believe in the necessity of the traditional assessment methods; therefore, it can be said that they may be using the alternative and traditional assessment in combination in their own classrooms when they become full-time EFL teachers.

In addition to the positive perceptions of the participants toward the alternative assessment methods, in the pre-survey, the majority of the students showed a positive attitude toward the use of online assessment methods as well by saying that the immediate feedback is provided, practicality and sharing are enhanced by the online methods even though almost half of the participants were not in agreement with the participants who had sympathy for the idea that the English language learning and teaching skills could be assessed through online methods. In the post survey, on the other hand, the participants' general attitudes were more positive but for some items the number of the participants who agreed and disagreed was almost the same. In these items, almost half of the participants believed that traditional assessment should not be replaced with technology based assessment, the exams should not be integrated with the technology, and online assessment is not more suitable to assess English language and teaching skills. Even though the participants who believed vice versa are more than half of the participants, there is still significant number of people who showed negative attitude toward online assessment methods. But still, the general attitude of the participants toward the use of online assessment came out positive in the post-survey just like it was in the pre-survey (General attitude: pre-survey, 2,762; post-survey, 2,983). As the attitude of the participants was more positive toward the online assessment after the tasks were implemented, it can be said that the participants had pleasant impression about the tasks.

When all three assessment types were compared, the order from the most preferred assessment type to least preferred assessment type was the same in both the pre- and post- surveys. While the most preferred assessment type was alternative assessment, the least preferred one was the traditional assessment. Even if the order of the participants' preference did not change, the general means of each assessment type changed. After the tasks were implemented, while the attitudes toward the alternative and online assessment methods got more positive, the attitudes toward traditional assessment methods got more negative, which makes it clear that the tasks had a positive effect on the participants.

Since assessment and technology is now an indispensable part of teaching and learning, as traditional assessment kept losing its popularity, alternative assessment via technology gained importance than ever. For the alternative assessment to be as successful as aimed, the factors to be implemented should be well-planned during design and

administration phases. To obtain fertile outcomes from the alternative assessment, the language skills to be addressed, the technological level of the target learner profile, the schedule of the tasks should be specified carefully. In the present study, the participants were not content when the two of the tasks clashed with their midterm and final exams, which affected their performance in a negative way as seen in their reflection papers and interviews. In addition, since the tools were all new to them and they were not given any training before the task implementation process except for the guidelines given before each task, they complained about spending too much time figuring out the tool than the task itself. For all these reasons, the instructors should take very purposeful steps while planning the alternative assessment process.

As for the limitations of the study, the data could have been gathered from the other grades of the same department and other ELT departments of the universities in Turkey. Therefore, it would have been much easier to generalize the results for the teachers who are interested in integrating web 2.0 tools to their classes for the purpose of assessment. A further research could be done with many more participants at different grades and universities to find out the perceptions of the students toward the technology integration to their courses. Additively, the period in which the study took place was for one semester – fourteen weeks; therefore, to monitor the long-term effects of the participants' perceptions toward being assessed via the web 2.0 tools, this period may not be adequate since the participants of the current study did not have the experience in web 2.0 tools and they were just getting used to them in this one semester. Hence, to reach more comprehensive results, longitudinal studies which last for one year or more can be carried out on the web 2.0 integration to courses for the purpose of alternative assessment.

IMPLICATIONS AND LIMITATIONS

This study is crucial in providing insight on how to prepare the pre-service teachers for the digital age where the students are all digital natives since it helps understanding the perspectives, needs and practices of pre-service teachers better. As also supported by the results of the study that almost all the pre-service teachers who participated in this study displayed positive perceptions toward adapting web 2.0 tools for assessment purposes, the instructors and administrators should start concentrating on how to integrate web-based technologies to their assessment system. The technology integration should start at schools as from the primary schools and even so before the task implementation, the process and how to use web 2.0 tools should be introduced to the students. In addition, motivating the students and having their attention has always been an issue for the teachers. During the present study, at every chance they got, the participants mentioned that web 2.0 tools made the course content more interesting, colorful, and enjoyable. Since the teachers have to make extra effort to keep the students motivated and focused especially while teaching English, they need to integrate web 2.0 tools to their curriculum. The challenges which prevent language teachers from technology integration for assessment purposes originate from lack of guidelines for planning, technological training, practice and technological equipment of schools and students. Language teachers who plan to adapt alternative assessment with the use of web-based technologies should be provided sources with guidelines and trained beforehand either during ELT pre-service teacher education or in-service training. The language teachers, who possess the necessary knowledge on technology and the guidelines from the related sources, should be given the opportunity to practice their knowledge, observed by the teacher educators and given feedback related to their improvement. The last but not the least, the language teachers should be provided with the necessary technological equipment by the administration of their schools and take into consideration whether their learners have their own personal computer or device to connect to the internet. If not, the possible solutions should be discussed at the planning phase and the tasks should be designed accordingly.

As for the limitations of the study, the data could have been gathered from the other grades of the same department and other ELT departments of the universities in Turkey. Therefore, it would have been much easier to generalize the results for the teachers who are interested in integrating web 2.0 tools to their classes for the purpose of assessment. A further research could be done with many more participants at different grades and universities to find out the perceptions of the students toward the technology integration to their courses. Additively, the period in which the study took place was for one semester – fourteen weeks; therefore, to monitor the long-term effects of the participants' perceptions toward being assessed via the web 2.0 tools, this period may not be adequate since the participants of the current study did not have the experience in web 2.0 tools and they were just getting used to them in this one semester. Hence, to reach more comprehensive results, longitudinal studies which last for one year or more can be carried out on the web 2.0 integration to courses for the purpose of alternative assessment.

CONCLUSION

The present study investigates the perceptions of ELT pre-service teachers on the use of web 2.0 tools for the purpose of alternative assessment. The study aims to find out the perceptions of the ELT pre-service teachers

toward the types of assessment and whether the ELT pre-service teachers' attitudes change toward traditional, alternative and online assessments after being assessed via Web 2.0 tools. The data was gathered through pre-and post-surveys, reflection papers, and a semi-structured in-depth interview from 40 second grade students who took the must course "ELT Methods I" at the ELT department of a state university. The results indicated that the participants showed a positive attitude toward the alternative assessment via web 2.0 tools more than they did to traditional or online assessment even though most of the participants believed in the necessity of the use of both the alternative and traditional assessment methods in combination.

REFERENCES

- Albion, P. (2008) Web 2.0 in teacher education: two imperatives for action. *Computers in the Schools*, **25** (3): 181-198.
- Bailey, K. M. (1998) *Learning about language assessment: Dilemmas, decisions, and directions*. Cambridge, MA: Heinle & Heinle.
- Balliro, L. (1993) What kind of alternative? Examining alternative assessment. *TESOL Quarterly*, **27** (3): 558-561.
- Barootchi, N., and Keshavarz, M. H. (2002) Assessment of achievement through portfolios and teacher-made tests, *Educational Research*, **44** (3): 279-288.
- Cephe, P. T., and Balçıkanlı, C. (2012) Web 2.0 tools in language teaching: What do student teachers think? *International Journal on New Trends in Education and Their Implications*, **3** (1): 1-12.
- Ching, Y.-H., and Hsu, Y.-C. (2011) Design-grounded assessment: A framework and a case study of web 2.0 practices in higher education. *Australian Journal of Educational Technology*, **27** (5): 781-797.
- Crandall, J. A. (2000) Language teacher education. *Annual Review of Applied Linguistics*, **20**: 34-55.
- Göktürk Sağlam, A. L. and Sert, S. (2012) Perceptions of in-service teachers regarding technology integrated English language teaching. *Turkish Online Journal of Qualitative Inquiry*, **3** (3): 1-14.
- Gray, K., Waycott, J., Clerehan, R., Hamilton, M., Richardson, J., Sheard, J. and Thompson, C. (2012) Worth it? Findings from a study of how academics assess students' Web 2.0 activities. *Research in Learning Technology*, **20**: 1-15.
- Herman, J. L., Aschbacher, P. R., and Winters, L. (1992) *A practical guide to alternative assessment*. Alexandria, VA.: Association for Supervision and Curriculum Development.
- Ishtaiwa, F., and Dukmak, S. J. (2013) Do Web 2.0 applications enhance learning in teacher education in the UAE? An exploratory study. *International Journal for Research in Education (IJRE)*, **33**: 1-27.
- Kessler, G. (2006) Assessing CALL teacher training: What are we doing and what could we do better? In P. Hubbard, and M. Levy (Eds.), *Teacher education in CALL* (pp. 23-42). John Benjamins: Amsterdam.
- Kumar, S., and Vigil, K. (2010) Pre-service teachers' perspectives on web 2.0 integration in teacher education courses. In: J. Sanchez and K. Zhang (eds.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2010*. Chesapeake, VA: AACE, 1908-1913.
- Oliver, K. (2007) Leveraging web 2.0 in the redesign of a graduate-level technology integration course. *TechTrends*, **51** (5): 55-61.
- O'Reilly, T. (2007) What is web 2.0: Design patterns and business models for the next generation if software. *Communications & Strategies*, **65**: 17-37.
- Prensky, M. (2001) Digital natives, digital immigrants. *On the Horizon*, **9** (5): 1-15.
- Solomon, G. and Schrum, L. (2007) *Web 2.0 new tools, new schools*. Washington: International Society for Technology in Education (ISTE).
- Warner, M., Steffen, C. and Cope, J. (2011) Raising the Bar for 21st Century Teacher Preparation. In: A. Cohan and A. Honigsfeld (eds.), *Breaking the mold of preservice and inservice teacher education: Innovative and successful practices for the twenty-first century*. New York: Rowman & Littlefield, 35-44.

APPENDIX A: A sample student copy of a task with a Web 2.0 tool “Glogster”



APPENDIX B: A sample rubric copy

TASK 5 Rubric					
Assignment: Designing a poster on the Total Physical Response Method.			Name and Surname of the Learner: _____		
	0 point	1 point	2 points	3 points	4 points
Content and Method	Method is not clearly mentioned. Content and method do not match at all.	Insufficient touch upon the method. Content and method minimally match in the activity with almost no creativity.	Somewhat covers the method. Content and method moderately match in the activity with one or two creative ideas.	Covers the method with few missing points. Content and method adequately match in the activity supported by some creative ideas.	Covers the method very comprehensively and clearly. Content and method perfectly match in the activity and reflected with creative ideas.
Meeting the Submission Requirements of the Task (Deadlines, use of Technology, Reflection Report)	Did not complete almost all of the requirements of the task and could not handle the technical features of the tool.	Completed the requirements of the task insufficiently and had a lot of technical problems managing the tool.	Completed some of the requirements of the task and had a few technical problems managing the tool.	Completed most of the requirements of the task and had few or no technical problems managing the tool.	Completed the requirements (4 steps) of the task perfectly and didn't have any technical problems managing the tool.
Layout of the poster	No or very little effort on the poster design. Readers would not prefer to learn from this poster.	Insufficient effort on the poster design. It looks boring and complicated.	Made use of some utilities the tool provides for the design. The poster looks okay.	Although the poster doesn't possess all the utilities the tool provides, it still has an attractive design.	Has a very attractive, colorful and creative design with graphics, colors etc. Readers would definitely enjoy it.
Variety of the sources	Did not support the content with any related sources to the content.	Supported the content with one or two sources (links, videos, images, audios and notes) not matching the content so much.	Supported the content with some sources (links, videos, images, audios and notes) sort of fits the content.	Reinforced the content with a few sources (links, videos, images, audios and notes) adequately matching the content.	Reinforced the content with various sources (links, videos, images, audios and notes) totally matching the content.
Pair evaluation	Did not fill in the evaluation form except for few insincere comments.	Did not pay attention to the evaluation form so much. The parts filled in are not so sincere.	Filled in the evaluation form with not so much sincerity and added few or almost no useful ideas.	Filled in almost all the evaluation form fairly and added some useful ideas.	Filled in the evaluation form completely and added very useful ideas with all sincerity.
TOTAL: _____					/20

Design on the MUVE: Synergizing Online Design Education with Multi-User Virtual Environments (MUVE)

Isinsu Sakalli

*School of Industrial Design, Carleton University, Canada
IsinsuSakalli@email.carleton.ca*

WonJoon Chung

*School of Industrial Design, Carleton University, Canada
WonJoon.Chung@carleton.ca*

ABSTRACT

The world is becoming increasingly virtual. Since the invention of the World Wide Web, information and human interaction has been transferring to the web at a rapid rate. Education is one of the many institutions that is taking advantage of accessing large numbers of people globally through computers. While this can be a simpler task for disciplines focusing on lecture-based learning, it has been a challenge for the field of design. Transferring its studio-based education structure, where students draw, build, collaborate, test and iterate their work, requires using technologies outside of the common ones in information-based disciplines. This literature review analyses the current tools used in online design education and an alternative technology, called multi-user virtual environments (MUVE). Addressing MUVE's technological features, limitations and use in education, this paper proposes that a synergy between MUVE and online design education would be mutually beneficial.

INTRODUCTION

Designing is the act or process of creating some end result or artifact (Boradkar, 2010). It is a field that requires both creative thinking and critical problem solving (Boradkar, 2010) in complex situations while considering clients, goals, collaborators, aesthetics, logistics, safety, resources and feasibility of the project (Boradkar, 2010; Schön, 1983). Today, the complexity in professional design projects requires collaboration of a team of individuals with diverse cultures, experiences, ideas, skills, knowledge and ways of thinking to maximize creative output (Badke-Schaub, 2010).

Design education must prepare the students for these complex settings and the design proficiencies they need in a professional setting (Broadfoot, 2003). Adapting and finding solutions within these complicated situations cannot be taught solely by lecture and requires practice (Waks, 2001). To handle such practically complex situations, traditional design education is characterized by its holistic approach for teaching students through a design studio approach (Broadfoot, 2003; Logan 2007; Schön, 1983; Waks 2001).

Studio-based learning, often practiced face-to-face, causes a challenge for teaching design online. Based on the extensive literature on design education, design studio proficiencies, online design education, and MUVE research, this paper highlights the benefits of possible synergy between online design education and MUVE as an educational environment. By becoming aware of MUVE's strengths and limitations, design instructors can use MUVE in their teaching to effectively prepare online students in practicing the necessary design proficiencies they need. Additionally, design instructors can enhance online learning by providing unique use and custom designs of the technology. Based on this literature review, this paper proposes that the synergy between online design education and MUVE can lead to a beneficial relationship between online learning and design education.

DESIGN STUDIO PROFICIENCIES

In design studios, students work within groups or individually to resolve a given design task supervised by their instructors (Broadfoot, 2003; Logan 2007). During the dynamic problem solving process (Broadfoot, 2003), students 'learn by doing' and 'reflection in action'. Students learn about the process and at the same time reflect on the process as it is executed (Broadfoot, 2003; Logan 2007; Schön, 1983). By doing so, design students work together to advance their collaboration proficiencies (Broadfoot, 2003), context proficiencies (Kvan, 2001; Schön, 1983), and iteration proficiencies (Gould, 1985). These proficiencies are soft skills, personality traits and behaviours that are professionally favourable (Schulz, 2008), the abilities students must foster to successfully compete in the market (Broadfoot, 2003). Exposure to design complexities and obtaining design soft skills are essential within a professional setting and can only be learned by actively doing and reflecting, they cannot be taught by lectures alone (Broadfoot, 2003). Below are the three aforementioned design studio soft skill categories students develop throughout their design studio work.

Collaboration Proficiencies: The complexity in professional design work requires the collaboration of many different people (Badke-Schaub, 2010). Simply placing people in teams does not mean they will work together effectively (Kvan, 2001; Schön, 1983). Aside from personality differences, the cultural and professional diversity within a group can lead to conflicting opinions, views and goals about the project (Badke-Schaub, 2010). To optimize team experience and output, it is important for design students to practice, understand and experience the dynamics and conflicts that take place in a team (Kvan, 2001). Only by doing so can students learn to mitigate the harmful conflicts and maximize the benefits of working in a diverse group (Haats, 2011).

Context Proficiencies: Being a field about problem solving (Boradkar, 2010), designers must be aware of the context for which they are solving a problem (Gordon, 2011). This requires extensive knowledge, keen observation of the environment, and understanding of the people for whom their design will be useful (Greci, 2013). While designers can assess abundant information about users, the experience and understanding gained from interacting within the context generates a more effective output (Gordon, 2011; Kvan, 2001). To optimize understanding of the context, students must improve their observational, listening, empathetic and analytical skills (Greci, 2013). These are required for finding information about the context as well as identifying the most significant ones and applying such information to their design work (Kvan, 2001).

Iteration Proficiencies: Iteration is fundamental to good design (Gould, 1985; Mantel, 1988). Rarely do designers create the best result in their first try (Gould, 1985). Designers tend to reach the best solution possible and save costs when iteration is applied properly (Mantel, 1988). Through collaboration, context research and testing, a lot of information is gathered on what to do with one's design. However, not everyone knows what they want or how to articulate it, and not all feedback can be applied (Gould, 1985). Henry Ford says that if he "asked the people what they wanted, they would have said faster horses." This demonstrates the significance of a designer in identifying how to iterate their work throughout their collaborations, context understandings and prototype testing (Gould, 1985).

As the theme in design studios is to 'learn by doing' and 'reflection by action' (Broadfoot, 2003), the students must learn the iterative process by doing, reflecting and redoing (Gould, 1985). In design studios, with the guidance of their instructor, students learn through successes and mistakes to perform the iteration process correctly. Design students must realize the significance of designing for an audience, develop the proficiencies for empathizing and understanding their context, and practice iteration towards their learning in the design process (Kvan, 2001; Schön, 1983).

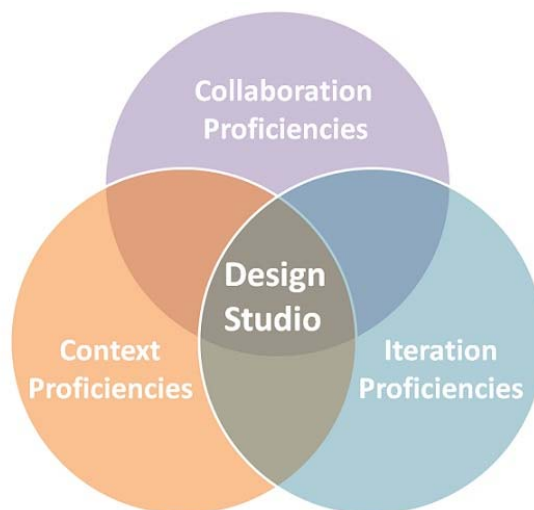


Figure 1. Illustration summarizing of the proficiencies students acquire in design studios.

As shown in Figure 1, while all these proficiencies vary, they all interact with one another and share a similarity in being practically acquired skills. However, since the audience for each design field is different (Buxton, 2010; Datta, 2007) the techniques and desirable outcomes from each type of design are also different. Design education must teach the students the requirements, techniques, expectations, and presentation skills in their design area (Buxton, 2010; Datta, 2007). As noted earlier, these design-specific skills cannot be taught merely by knowledge transfer and require an environment where the students can explore, repeat, and reflect to improve their work (Felder, 1988).

Practical proficiencies that cannot be taught via knowledge transfer require the student to explore, repeat, reflect and improve (Kvan, 2001; Schön, 1983). Doing so in the correct manner requires an educational environment in which they can practice these proficiencies, hone their skills with the guidance of an expert instructor, and be best prepared for the complex workforce.

SHIFT TO ONLINE DESIGN EDUCATION

The invention of World Wide Web in 1992 made online education easily accessible around the globe, flexible in learning pace, and integrative with novel multimedia (Harasim, 2000). Since then, disciplines have aspired to teach online but faced challenges in adapting to the unique technologies (Park, 2008).

Researchers have shown that active and engaging online education can promote creative thinking, problem solving (Broadfoot 2003; Waks 2001; Park, 2011), and enhance collaborative task-based productivity while overcoming the remote and financial restrictions of face-to-face learning for some students (Elliott, 2003; Liegel, 2004). Furthermore, learning in an online setting provides the students with the potential to work with experts and cultures anywhere in the world at any time (Brown, 2005; Vrasidas, 2003; Harasim, 2000) without exorbitant travel costs (Kvan, 2001). While journals may offer minimal understanding of other cultures, the real-time interaction with international students and teachers is substantially better (Kvan, 2001).

The cost effectiveness, convenience, and global accessibility are also very useful for design education. Given the benefits of collaborating with a diverse group (Badke-Schaub, 2010) online education can bring together people from all over the world for design students to practice working together (Harasim, 2000) without the high travel costs.

Given all these advantages, design is also shifting to online learning (Park, 2008). However, rather than utilizing the tools for new forms of communication, interaction and learning, many online educators commonly digitize their existing content, such as with educational videos (Barnes, 2007; Janet, 2009; Kirkup, 2005). This method is not effective for design education (Kvan, 2001). The studio-based nature of design education poses a unique challenge for its adaptation to online learning (Park, 2008). Regardless of all the benefits of online design learning, without satisfactory design studio features, design education cannot be conducted effectively in an online setting. As noted earlier, in an effective online design course, students' must practice their collaboration, context sensitivity, creative thinking, reflections, research, iterations, and problem solving soft skills within a studio-based setting (Broadfoot 2003; Waks 2001). Only by doing so can their online learning experience best prepare them for the complex nature of a professional design setting (Broadfoot, 2003; Park, 2008).

ONLINE DESIGN STUDIO TECHNOLOGY OPTIONS

To practice online design studios for learning the three design proficiencies, four technology categories are found in the literature. These four technology categories are computer-aided design (CAD) software, augmented reality devices, SMART boards, and MUVE platforms.

1. Computer - Aided Design (CAD) tools allow students to create 2-dimensional drawings or 3D models of their concepts while communicating only through voice, video, chat and screenshare features (Lau, 2013; Li, 2005). These programs, demonstrated in Figure 2, are easy to access, allow real-time collaboration and synchronous design iteration (Lau, 2013). CAD is a useful technology for design students to learn because most design corporations also use some type of CAD (Brown, 2005).



Figure 2. Example of a collaborative CAD program, Fusion 360, which allows teams to jointly work on a cloud-based model together in real-time (Hayes, 2013).

Initially, CAD appears to be a sufficient tool for its digitalized lecture content and traditional communication tools, such as Webcams, forums, social networking and text chatting. In practice, CAD lacks student engagement (Cormier, 2009) and non-verbal communication (Nam, 2009), such as gaze and gestures, greatly affecting tele-collaboration (Vertegaal, 1999; Buxton, 1992; Ishii, 1998). Student engagement refers to the time and effort the student spends on their academic study and activity (Kuh, 2003). The engagement of the students positively relates to the depth and amount of information they learn, their problem solving and analysis abilities, and quality of output from their activities. Smith et al. (2009) state that key aspects of design education entail the participant's engagement and active participation. For effective collaboration and studio practice in online design learning, student engagement is essential (Park, 2011; Janet, 2009).

In online learning technologies, enabling student engagement relies primarily on the tools that maximize student's telepresence, or sense of connecting to others via technologies as if they are not remotely separated (Moldenhauer, 2010; Nam, 2009; Savin-Baden, 2010). Increasing a student's sense of telepresence in an online course increases their engagement, participation (Slater, 1986), sense of belonging in a community (Lau, 2013; Moldenhauer, 2010), interaction, learning, (Moldenhauer, 2010; Rowell, 2009; Savin-Baden, 2010; Slater, 1986), contribution (Cormier, 2009), course performance (Hara, 2003; Rovai, 2005) and professional performance (Savin-Baden, 2010). Overall, maximizing engagement in online design education provides the students with the space to perform their best within the course and their professions.

As essential as telepresence and engagement is, much computer software, including instructional videos and CAD, used in online design education fails to maximize the student's telepresence (Cormier, 2009; Lau, 2013; Savin-Baden, 2010; Park, 2011).

2. Augmented reality devices are worn by users to give them a sense of existence to something that is not really in the physical world (Savin-Baden, 2010). For example, Nam and Sakong (2009) conducted an experiment using augmented reality devices to enhance collaborative object workspace at distance. By using virtual shadows and synch-turntables shown in Figure 3, design students were able to synchronously manipulate the object shown in Figure 3 (A) and be aware of their partner's actions and gestures. The results show an increased sense of working together in a shared space with their partner, comprehension of their partner's gestures and actions (Nam, 2009).



Figure 3. Images demonstrate (A) the virtual camera object the students can see with their augmented reality at the center of the turntable and (B) and (C) are simultaneous views from each participant showing the shadow of the other (Nam, 2009).

3. SMART boards are interactive whiteboards that can detect touch and gestures, that allow the space on top of the board to be shared with others who are also using SMART boards (Everitt, 2003). Researching on effective remote collaboration, Everitt et al. (2003) had six designers use SMART boards who were enthusiastic about the shared workspace and found the features to increase telepresence compared to whiteboard and videoconferencing. Figure 4 demonstrates the interactive feature of the SMART board where (A) and (B) images are from two different SMART boards used by geographically separated teams. (A) shows the digital views of the post-it notes from the (B) board. (A) moves the electronic version of the "Cats" post-it note which appears simultaneously on board (B). Additionally, (C) demonstrates the shadow outline of the remote collaborator from the other board to increase tele-presence.

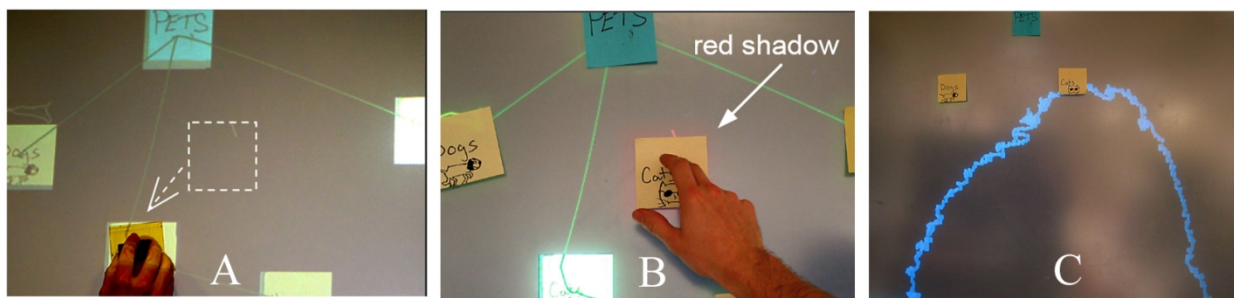


Figure 4. SMART board collaborative synchronous features (Everitt, 2003).

Both augmented reality devices and SMART boards tools are engaging and intuitive to apply in a design studio setting allowing students to visually express their designs and collaborate (Everitt, 2003; Nam, 2009; Savin-Baden, 2010). The primary challenge with using these in online design education is their high cost (Everitt, 2003). They are not affordable or accessible for the broad student population (Lau, 2013) and especially for the student population that prefers online learning because of its lower fees (Kvan, 2001). Since most higher education students interested in online learning own computers (Lau, 2013), online educators have turned to using online computer software for teaching design proficiencies (Kvan, 2001).

The tools mentioned in this section all lack an important part of conducting an online studio in design education (Janet, 2009; Park, 2008). The augmented reality and SMART technologies demonstrate that for design to take full advantage of the cost-effectiveness and global collaboration of online education, online tools used must be accessible to a broad range of students (Brown, 2005; Janet, 2009; Park, 2011). While CAD satisfies these requirements, it does not encourage student engagement (Cormier, 2009). Therefore, new online teaching methods must be adopted if design education seeks to use the benefits of online learning without the cost of sacrificing the necessary experience of design studios to the students (Kvan, 2001; Broadfoot 2003; Waks 2001; Park, 2008; Park, 2011; Harasim, 2000). As an alternative solution for online design learning to explore, this paper proposes the use of fourth option: multi-user virtual environments (MUVE).

4. Multi-User Virtual Environment (MUVE) platforms are computer software that enable multiple users, represented by avatars, to navigate and collaborate in a 3D virtual world in real-time (Bessière, 2009; Warburton, 2009; White, 2010). Popular examples of MUVE software in education are Second Life, Immersive Terf, AvayaLive Engage and River City (Bessière, 2009). MUVE comes with a large variety of features within a single software application that collectively provide key features needed for online design education: easy accessibility, design visualization tools, communication tools, and student engagement.

The features of MUVE and the key requirements they meet are listed below:

1. Running on a cloud server and not requiring any additional tools (Greci, 2013), MUVE has broad accessibility for anyone with Internet access to join around the world at a low expense (Warburton, 2009).
2. Using a shared online virtual 3D space, MUVE enables multiple users to simultaneously participate and experience the same dynamic events at the same time. Improving the student's sense of presence and engagement within the environment, community and collaborative activity (Warburton, 2009).
3. 3D avatars that represent the user allow the participants to project their own identities into the virtual space (Meadows, 2008). This projection increases their sense of being within the environment and thus increasing the user's sense of presence and engagement in the space (Meadows, 2008; Slater 1986).
4. Audio communication, text chatting, webcam streaming, screen-sharing and avatar gestures allow for multisensory and versatile ways of communication between collaborators (Warburton, 2009).
5. The 3D world and avatars can be customized by the users, allowing both features to be presented as needed. This allows the students to not only make 3D models of objects as they do in CAD, but provides the ability to customize the appearance of the space and avatars to create a virtual context (Warburton, 2009). This custom created virtual context increases the sense of presence of students for a specific topic (Slater 1986).
6. Having real world similarities, such as topography, movement and physics, provides the illusion of being in a 'real' space and makes the interactions within the environment more intuitive for users while also improving their sense of presence (Warburton, 2009; Meadows, 2008).
7. Using websites collaboratively within the MUVE platform provides access to many online collaborative drawing features (Warburton, 2009).
8. Video recording functions can be used by designers to reflect on their actions and better learn from their experience by remembering and watching their progress from a 3rd perspective (Meadows, 2008).

Combining all the aforementioned features into one package with advanced visual representations, MUVE is a popular and effective tool for collaborative simulations for people to effectively transfer their knowledge, skills and behaviours into the real world. Other fields have used MUVE in psychological therapy for phobias and trauma (Fullerton, 2004), changing dietary behaviours (Johnston, 2012), patient interaction in medical care (Greci, 2013), professional collaboration and critical thinking skill and behavioural development (Tichon, 2006) and process comprehension in the workplace, such as in mining, aviation, nursing, and pediatrics (Tichon, 2006). The following three studies demonstrate the potential for using MUVE for students to practice the three design studio proficiency categories: collaboration, context and iteration proficiencies.

COLLABORATIVE PROFICIENCIES IN MUVE

Shrine Education Experience (SEE) was a project that involved students from all over the world in learning about archaeological findings within a custom designed MUVE, as shown in Figure 5 (Di Blas & Hazan, 2003; Di Blas & Paolini, 2003). This massive project had cooperative activities in which approximately 1400 students from Europe and Israel aged 12-19 worked together and played collaborative "cultural games" to learn about history, religion, anthropology and collaborate with one another (Di Blas & Hazan, 2003). The results of the studies showed a great majority of the students enjoyed learning and were motivated to participate, experienced how many different fields can converge to solve one issue, fascinated in interacting and collaborating with peers in distant countries with very different perspectives (Politis, 2008) and reflected on the significance of their learning relative to their own culture, everyday lives, and behaviours (Di Blas & Paolini, 2003). Throughout the study, students gained vital cross-cultural and interdisciplinary collaboration experiences (Di Blas & Paolini, 2003).



Figure 5. The Virtual rendition of the Israel Museum's Shrine in the background with the students from around the world controlling their avatars (Di Blas & Hazan, 2003).

CONTEXT PROFICIENCIES IN MUVE

To better understand and empathize local issues by engaging in Boston's Chinatown neighbourhood, Gordon and Schirra (2011) created a *Participatory Chinatown* environment in MUVE, shown in Figure 6, for urban planning students. The task for the students was to explore the virtual space, interact with the characters in the environment, discuss their observations with peers, and propose possible future designs for Chinatown. The study results show that the immersive, role-playing experience gave the students a strong sense of connection with the local community and a deeper understanding of their lifestyles and issues. Furthermore, the students who took the initiative to create discussion groups generated a deeper understanding of the context and provided more effective solutions for the town (Gordon, 2011).



Figure 6. (A) Participatory Chinatown modeled after Boston Chinatown where (B) a student playing as the avatar in the center.

DESIGN ITERATION IN MUVE

The OpenHabitat project was a 15 month study in which Art and Design university students engaged in collaborative design and experiential learning using MUVE (Warburton, 2009). Their activities took advantage of an unlimited 3D canvas to build physically or financially impossible things in the real world, for example building 3D realistic and surrealistic trees as shown in Figure 7.

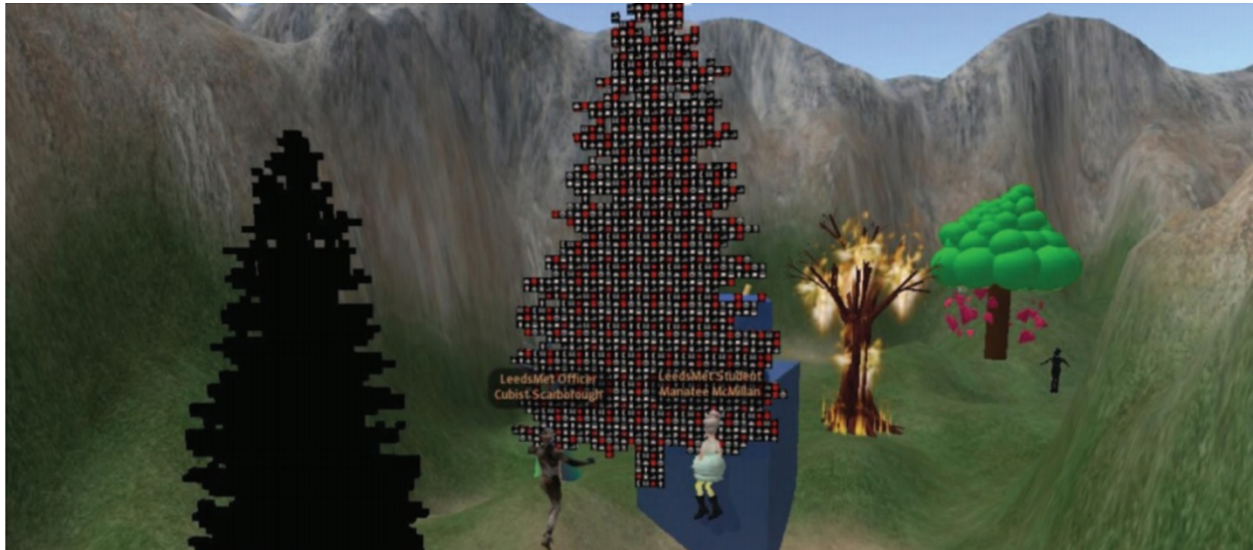


Figure 7. Four of the art and design trees during the pilot (Warburton, 2009).

After the initial orientations, students found the functions easy to use and were amazed at the boundless building capacity and the simplicity of the task, compared to real life. Having their models in a space where many can see them, made the students more attentive to their designs (White, 2010). The results of the study show that the students felt avatars represented the people well (Warburton, 2009), and had a strong sense of presence and belonging to a community (White, 2010). Their ability to work within a common space also encouraged working together through constructive dialogue, supporting one another's creative endeavour and the cross-pollination of design ideas. Although the study does not directly address design iterations, it addresses some of the key interactions for iteration: collaborative design, presenting work, observing other's designs, and giving and receiving constructive feedback (Gould, 1985). With the assistance of a design mentor, the students can learn to analyze these information and apply them to their work appropriately.

These three examples demonstrate the effective use of MUVE for developing design studio proficiencies. Fostering the strengths of these teaching methods in the design field could create an online design education environment for students to gain similar experiences, soft skills and preparation for the professional field.

MUVE LIMITATIONS

To best utilize a technology, knowing its limitations is just as important as its strengths (Park, 2008). Prior to the implementation of MUVE within any course, it is essential to initially be aware of its limitations. Doing so sets the parameters and expectations that users should have when they design their courses, activities, and simulations (White, 2010).

Most of the critics believe that even if online learning technologies improved significantly, it would still not be a learning system capable of substituting for face-to-face experiences (Ho, 2002; Park, 2008; Quinsee, 2004). For example, having limited gestures and facial expressions decreases effective non-verbal communication, empathy towards the avatars and engagement in the simulation (Arya, 2010; Volkova, 2011). Bucy (2003) notes that a bulk of research conducted on the efficacy of online courses only compare online learning to traditional course outcomes. This causes a bias and neglects the inherent problems in face-to-face interactions that can disrupt effective collaboration (Vrasidas, 2003), which MUVE overcomes, such as balancing the status and power among the users (Greenhalgh, 1995; White, 2010) and removing judgment of people's true appearances (Vrasidas, 2003). Thus, it is important to understand the capability of the technology to avoid unrealistic expectations.

The second most common limitation is the learning curve for students using MUVE (Bessière, 2009; Warburton, 2009). While for some users the controls and functions in MUVE may come naturally, especially for those who play video games, it can be a challenge for others. Some students have mentioned that they found their initial experience overwhelming, with feelings of confusion and anxiety (Conrad, 2002, Rovai, 2005). As a consequence, students cannot concentrate on the task, lose quality communication, manage group conflicts, and perform effectively (Nowlan, 2011). It is essential for students to initially become familiar with using the technology and for educators to provide an initial tutorial phase within the course (Zembylas, 2008)

More pertinent to design is the lack of physical interaction with the objects (Bessière, 2009). Designers who will be creating the object in real life care substantially about the feel of the design and the ability to interact with the design. This is also an issue for instructors when judging and providing feedback to the students (Kvan, 2001). Another consequence is the misinterpretation of the virtual object compared to its real life form (Pickup, 2011). It has been proven that size of the avatar relative to the viewer's actual body can change the user's expectations about the objects in the environment.

A poor session in MUVE can make the participants feel their experience was less eventful and isolated than many other online social media, including forums and text chat. (Cormier 2009). Objects, simulations, content, teaching materials, and learning activities have to be customized when using the virtual world to merge the technology with the curriculum. Educators are encouraged to have a good understanding of the technology's capabilities and limitations before engaging in its use to avoid disappointment, miscommunication and student confusion between the expectations of the instructor and the student's resources within the technology (Vrasidas, 2003; Zembylas, 2008).

DISCUSSION

By utilizing these tools, learning from past successful MUVE projects and becoming aware of the technological limitations in MUVE, educators can enhance online design education to become more engaging for the students. There are many areas of study to conduct when researching the benefits of using MUVE for enhancing design studio proficiencies. For collaboration, effective teamwork over distance opens the possibilities for students to experience cross-cultural design with partners located anywhere in the world. For context, simulations and role-playing can be large contributing factor to design education. Students can practice their sensitivity to the context of their future designs by being tasked to explore the space, communicate and empathize with the clients, and pick-up important cues that they can apply to their designs. For iteration, students can learn to iterate their designs together by giving each other feedbacks. Taking advantage of becoming avatars, face-to-face criticism can be avoided for students to be more comfortable providing each other with constructive feedback. Thus, students could learn to criticize, ask questions, take criticism, analyze people's feedbacks, and modify their designs appropriately with the guidance of an expert.

Furthermore, being an inherently creative, user-centered and hands-on field, design has the potential to bring a wide range of novelty to the ways that MUVE can be used. Design instructors are already proficient in and used to teaching innovation, user-friendly and intuitive designs (Broadfoot, 2003), creating unique active and collaborative projects (Waks, 2001). Designers who are also skilled at 3D modeling are capable of making the virtual world more user friendly, intuitive, and unique. Teachers who are creative in their studio teaching and class activities can create more imaginative projects to engage and educate students. Online design education projects have the potential to provide novel ways of using the technology that many other fields can take example from. Non-design fields not accustomed to these unique and active learning methods inherent in design studios could learn new teaching techniques and activities they can apply to their teachings on MUVE. The potential integration the research conducted on MUVE technology into design education could additionally benefit non-design fields in using the virtual world in unique and interactive ways. Therefore, synergy between design and MUVE technology and researching on effective use of virtual worlds in online design studios could assist the learning of online students all around the world.

Implementing these features in a curriculum requires teachers who have the willingness to become well versed with this novel technology and be creative in their teaching methods. This can be a challenge for many, but those who put in the effort can provide the opportunity for students who have financial or lifestyle limitations to participate in an active, innovative, engaging, multi-cultural, and interdisciplinary design experience.

CONCLUSION

The growth of online education is imminent. Even practical fields, like design, are becoming taught at distance. The majority of the current technology used in online design education is not sufficient to provide effective studio experiences for design education. The functions within MUVE make it accessible, user-friendly, engaging, and collaborative, while providing designers with visualization tools to present their work. Using MUVE within their curriculum, design instructors have the potential to provide their students with the opportunity to develop their collaborative, context and iterative proficiencies. These soft skills are essential for design students to survive in a competitive, diverse and complex professional design environment. In addition to benefiting design students, non-design disciplines may also benefit from the innovative MUVE activities that design instructors developed. The synergy between online education with MUVE technology and design can lead to a mutually beneficial relationship and advance the world of education.

REFERENCES

- Arya, A., Nowlan, N., & Sauriol, N. (2010). Data-driven framework for an online 3D immersive environment for educational applications. In *Proceedings of the International Conference on Education and New Learning Technologies*.
- Badke-Schaub, G. G., & Meijer, M. (2010). How does cognitive conflict in design teams support the development of creative ideas? *Creativity and Innovation Management*, 19(2), 119- 133.
- Barnes, C., & Tynan, B. (2007). The adventures of Miranda in the brave new world: learning in a Web 2.0 millennium. *Research in Learning Technology*, 15(3).
- Bessière, K., Ellis, J., & Kellogg, W. (2009). *Acquiring a professional "second life": Problems and prospects for the use of virtual worlds in business*. Paper presented at the CHI '09 Extended Abstracts: on human factors in computing systems. 2883-2898. doi:10.1145/1520340.1520416
- Blas, D. N., Paolini, P., & Hazan, S. (2003). The SEE Experience: Edutainment in 3D Virtual Worlds.
- Boradkar, P. (2010). Design as Problem Solving. In *The Oxford Handbook of Interdisciplinary* (eds Frodeman, Robert, Klein Julie Thompson, and Mitchan, Carl) New York: Oxford University Press, Chapter 19, pg. 273-287.
- Broadfoot, O., & Bennett, R. (2003). Design studios: online. In *Apple University Consortium Academic and Developers Conference Proceedings 2003* (pp. 9-21).
- Brown, J. (December 2005). *The Global Product Design Benchmark Report: Managing Complexity as Product Design Goes Global*. Retrieved from https://www.plm.automation.siemens.com/en_us/Images/Q4_RA_GlobalProductDesign_JB_123005bspf_tcm1023-23397.pdf
- Buxton, W. (1992, September). Telepresence: Integrating shared task and person spaces. In *Proceedings of graphics interface* (Vol. 92, No. 1992, pp. 123-129).
- Buxton, B. (2010). *Sketching User Experiences: Getting the Design Right and the Right Design: Getting the Design Right and the Right Design*. Morgan Kaufmann.
- Conrad, D. L. (2002). Engagement, excitement, anxiety, and fear: Learners' experiences of starting an online course. *The American Journal of Distance Education*, 16(4), 205-226.
- Cormier, D. (2009). MUVE eventedness: An experience like any other. *British Journal of Educational Technology*, 40(3), 543-546.
- Datta, A. (2007). Gender and learning in the design studio. *Journal for Education in the Built Environment*, 2(2), 21-35.
- Di Blas, N., Paolini, P., & Poggi, C. (2003). SEE (Shrine Educational Experience): an online cooperative 3D environment supporting innovative educational activities. In *World Conference on Educational Multimedia, Hypermedia and Telecommunications* (Vol. 2003, No. 1, pp. 1527-1534).
- Elliott, K. A., Efron, D., Wright, M., & Martinelli, A. (2003, December). Educational technologies that integrate problem based learning principles: Do these resources enhance student learning. In *Interact, Integrate, Impact: Proceedings 20th ASCILITE Conference*. Adelaide (pp. 7-10).
- Everitt, K. M., Klemmer, S. R., Lee, R., & Landay, J. A. (2003). Two worlds apart: Bridging the gap between physical and virtual media for distributed design. *SIGCHI Conference on Human Factors in Computing Systems* (553-560). New York: ACM Press.
- Felder, R. M., & Silverman, L. K. (1988). Learning and teaching styles in engineering education. *Engineering education*, 78(7), 674-681.
- Fullerton, T., Swain, C., & Hoffman, S. (2004). *Game design workshop: Designing, prototyping, & playtesting games*. CRC Press.
- Greci, L. S., Ramloll, R., Hurst, S., Garman, K., Beedasy, J., Pieper, E. B., ... & Agha, Z. (2013). vTrain: A Novel Curriculum for Patient Surge Training in a Multi-User Virtual Environment (MUVE). *Prehospital and disaster medicine*, 28(03), 215-222.
- Greenhalgh, C., & Benford, S. (1995). MASSIVE: a collaborative virtual environment for teleconferencing. *ACM Transactions on Computer-Human Interaction (TOCHI)*, 2(3), 239-261.
- Gordon, E., & Schirra, S. (2011, June). Playing with empathy: digital role-playing games in public meetings. In *Proceedings of the 5th International Conference on Communities and Technologies* (pp. 179-185). ACM.
- Gould, J. D., & Lewis, C. (1985). Designing for usability: key principles and what designers think. *Communications of the ACM*, 28(3), 300-311.
- Haats, T. & Frankel, L. (2011). *Conflict and Creativity within Design Teams*. Paper presented at IASDR Conference: Diversity and Unity. Delft, Netherlands.
- Hara, N. (2000). Student distress in a web-based distance education course. *Information, Communication & Society*, 3(4), 557-579.
- Harasim, L. (2000). Shift happens: Online education as a new paradigm in learning. *The Internet and higher education*, 3(1), 41-61.

- Hayes, J. (2013, June 27). *Collaborative “CAD in the Cloud” from Autodesk and GrabCAD Starts Today with Free Trial*. Retrieved from <http://www.engineering.com/DesignSoftware/DesignSoftwareArticles/ArticleID/5928/Collaborative-CAD-in-the-Cloud-from-Autodesk-and-GrabCAD-Starts-Today-with-Free-Trial.aspx>
- Ho, S. (2002, February). Encouraging on-line participation. In *Teaching and Learning Forum*.
- Ishii, H., Kobayashi, M., & Grudin, J. (1993). Integration of interpersonal space and shared workspace: ClearBoard design and experiments. *ACM Transactions on Information Systems (TOIS)*, 11(4), 349-375.
- Janet, J., & Miles, M. (2009). ARTEMIS: Reinvigorating History and Theory in Art and Design Education. *International Journal of Art & Design Education*, 28(1), 52-60.
- Johnston, J. D., Massey, A. P., & DeVaneaux, C. A. (2012). Innovation in weight loss programs: a 3-dimensional virtual-world approach. *Journal of medical Internet research*, 14(5).
- Kirkup, G., & Kirkwood, A. (2005). Information and communications technologies (ICT) in higher education teaching—a tale of gradualism rather than revolution. *Learning, Media and Technology*, 30(2), 185-199.
- Kuh, G. D. (2003). What we're learning about student engagement from NSSE: Benchmarks for effective educational practices. *Change: The Magazine of Higher Learning*, 35(2), 24-32.
- Kvan, T. (2001). The pedagogy of virtual design studios. *Automation in Construction*, 10(3), 345-353.
- Lau, H. F., Kan, C. W., & Lau, K. W. (2013). How Consumers Shop in Virtual Reality? How It Works?. *Advances in Economics and Business*, 1, 28 - 38. doi: 10.13189/aeb.2013.010104
- Li, W. D., Lu, W. F., Fuh, J. Y., & Wong, Y. S. (2005). Collaborative computer-aided design—research and development status. *Computer-Aided Design*, 37(9), 931-940.
- Liegel, K. M. (2004). Project-based learning and the future of project management. In *PMI global conference 2004–North America, conference proceedings*.
- Logan, C. (2008). Metaphor and pedagogy in the design practicum. *International Journal of Technology and Design Education*, 18(1), 1-17.
- Meadows, M. S. (2007). *I, avatar: The culture and consequences of having a second life*. New Riders.
- Moldenhauer, J. A. (2010). Virtual Conferencing in Global Design Education: Dreams and Realities. *Visible Language*, 44(2), 219-242.
- Mantei, M. M., & Teorey, T. J. (1988). Cost/benefit analysis for incorporating human factors in the software lifecycle. *Communications of the ACM*, 31(4), 428-439.
- Nam, T., & Sakong, K. (2009). Collaborative 3D workspace and interaction techniques for synchronous distributed product design reviews. *International Journal of Design*, 3(1). Retrieved from <http://search.proquest.com/docview/921472608?accountid=9894>
- Nowlan, N. S. (2011). *Modeling the Effect of Perceived Ease of Use on Virtual Team Performance* (Doctoral dissertation, Carleton University).
- Park, J. Y. (2008) Online learning of visual design course : framework for the interactive learning. *The International Journal of Learning*, 14(12). pp. 13-21.
- Park, J. Y. (2011). Design education online: Learning delivery and evaluation. *International Journal of Art & Design Education*, 30(2), 176-187.
- Politis, D. (Ed.). (2008). *E-learning methodologies and computer applications in archaeology*. IGI Global.
- Quinsee, S. & Hurst, J. (2005). Blurring the boundaries? Supporting students and staff within an online learning environment. *The Turkish Online Journal of Distance Education*, 6(1), pp. 1-9.
- Rovai, A. P., & Wighting, M. J. (2005). Feelings of alienation and community among higher education students in a virtual classroom. *The Internet and higher education*, 8(2), 97-110.
- Rowell, A. (April 2009). *Design Anywhere: Maximizing the Global Opportunity, Minimizing the IP Risk*. Retrieved from www.savaco.com/file_download/44/DesignGlobalization.pdf
- Savin-Baden, M. (2010). *A practical guide to using Second Life in higher education*. McGraw-Hill International.
- Slater, M., & Wilbur, S. (1997). A framework for immersive virtual environments (FIVE): Speculations on the role of presence in virtual environments. *Presence: Teleoperators and virtual environments*, 6(6), 603-616.
- Schön, D. A. (1987). Educating the reflective practitioner: Toward a new design for teaching and learning in the professions. *San Francisco*.
- Schulz, B. (2008). The importance of soft skills: Education beyond academic knowledge.
- Smith, D., Hedley, P., & Molloy, M. (2009). Design learning: a reflective model. *Design Studies*, 30(1), 13-37.
- Tichon, J. (2006). Training cognitive skills in virtual reality: Measuring performance. *CyberPsychology & Behavior*, 10(2), 286-289.
- Waks, L. J. (2001). Donald Schon's philosophy of design and design education. *International Journal of Technology and Design Education*, 11(1), 37-51.
- Warburton, S. (2009). Second Life in higher education: Assessing the potential for and the barriers to deploying virtual worlds in learning and teaching. *British Journal of Educational Technology*, 40(3), 414-426.

- White, D., & Le Cornu, A. (2010). Eventedness and disjuncture in virtual worlds. *Educational Research*, 52(2), 183-196.
- Vertegaal, R. (1999, May). The GAZE groupware system: mediating joint attention in multiparty communication and collaboration. In *Proceedings of the SIGCHI conference on Human Factors in Computing Systems* (pp. 294-301). ACM.
- Volkova, E. P., Linkenauger, S. A., Alexandrova, I., Buelthoff, H. H., & Mohler, B. J. (2011). Integration of visual and auditory stimuli in the perception of emotional expression in virtual characters. *Perception*, 40(ECVP A), 138-138.
- Vrasidas, C., & Zembylas, M. (2003). The nature of technology-mediated interaction in globalized distance education. *International Journal of Training and Development*, 7(4), 271-286.
- Zembylas, M., Theodorou, M., & Pavlakis, A. (2008). The role of emotions in the experience of online learning: Challenges and opportunities. *Educational Media International*, 45(2), 107-117.

Designing Effective Curricula with an Interactive Collaborative Curriculum Design Tool (CCDT)

Seda Khadimally

*School of Advanced Studies, University of Phoenix
sedakhadimally@email.phoenix.edu*

ABSTRACT

Guided by the principles of the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) instructional design (ID) model, this creative instructional product presents a learning/teaching approach that is fundamentally constructivist. For the purposes of designing effective instruction in an academic preparation course, a *Collaborative Curriculum Design Tool* (CCDT) was chosen as the major educational technology tool. The target audience includes adult English as a second language (ESL) students preparing for undergraduate and/or graduate schools in the U.S. Based on this specific learner group in this academic preparation course, the primary learning objective of this design is to help students improve their academic English skills in various domains. Technological tools selected to achieve this learning goal consist of those that promote the development of each competency in the language. There are numerous software programs employed to support students' vocabulary, reading, and writing skills development, in addition to assisting with their improvement in listening and speaking fluency.

Keywords: CCDT, instructional product, constructivist learning approach, ADDIE, ID model, effective instruction, adult ESL students, academic preparation course, technology tools, development of academic English skills in various domains, vocabulary, reading, writing, listening, and speaking competencies.

INTRODUCTION

Continuous technology use both inside and outside of the classroom is a driving force behind this instructional product, which is empowered by various audiovisual technologies that are designed to promote students' improving their academic English skills in all skills (i.e., vocabulary, reading writing, listening, speaking). In order to reach this goal, a comprehensive unit lesson curriculum (i.e., Unit 7, Microbiology) was created. All of the technologies that assist with ESL students' meaning making during their learning were listed in the CCDT in a way that the reader can appreciate for what academic skill enhancement a particular technology was utilized. Besides this unit curriculum design generated on the CCDT, there is also the second technology (i.e., Prezi, presentation software) via which almost all components of the design were demonstrated. Watching this presentation, the viewer can have a quick overview of all of the elements that went into the unit curriculum design produced through CCDT. The latter is an interactive, animated technology where the guiding principles of the selected instructional model, ADDIE, and constructivist learning theory on which this unit curriculum design was grounded can be observed. Considering that learning is an activity which is defined as "a persisting change in human performance or performance potential" (Driscoll, 2005, p. 9), this particular instructional design appears to deliver this, justifying the guiding principles of the aforementioned theoretical learning framework (i.e., constructivism) and the instructional model (i.e., ADDIE).

ACHIEVING MEANINGFUL LEARNING WITH THE CONSTRUCTIVIST LEARNING APPROACH

Constructivism (Vygotsky, 1978) is a theoretical framework which refers to the fact that when guided by the instructor or facilitator, students can gradually improve their performances both inside the classroom and outside, where they begin to direct their own learning, construct their own meanings from the given topic, and thus master academic skills necessary for them to incorporate into real-life cases. The constructivist learning approach, coupled with informal, digital media-rich educational practices in a world of digital technologies today gives learners "more control of what, where, and how they learn and usually involves intrinsic motivation" (Reiser & Dempsey, 2007, p. 167). It leads to meaningful learning in class with learners' collaborative, interactive work in group-based settings (Gagne, Wager, Golas, & Keller, 2005). Given that a plethora of ID practices in the literature aim at human performance improvement (HPI)—or human performance technology (HPT)—(Gagne et al., 2005; Reiser & Dempsey, 2007), it should be no surprise that constructivism is a learning theory that is intertwined with this learning objective. Such learning is also called self-directed learning that, if supported with innovative learning tools, can yield higher learning outcomes on the part of the millenials (Dede, 2011).

ADDIE: A POPULAR ID MODEL

As they seek to facilitate learning/teaching practices that are personalized and meaningful for learners, instructors can greatly take from ADDIE, which is a highly popular ID model for designers of effective instructional/training programs (Reiser & Dempsey, 2007). Especially when designed based on the underlying principles of ADDIE, all educational activities in any industry sector or educational field can yield positive learning outcomes. Under the umbrella of ADDIE, a solid analysis of needs or problems plays a crucial role in defining learning objectives or goals that the designer, trainer, or instructor is to set for his/her learner group. It is a well-known fact that the five essential elements ADDIE consists of have been modified from other ID models over the course of time due to the changing learning styles (Bloom, 1968), needs, and demands of today's learners directing their own learning in the digital age, and with the approaches to learning that have had to adjust to such transformation in education. Nevertheless, it is a modified, albeit a reliable guide to those who desire to bring to life authentic educational products with the sole purpose of enhancing their learners' academic performances both inside and outside of the classroom. Awareness and execution of these five core components can yield positive learning outcomes if all teachers and educational leaders are on board with robust technology integration into instruction. Identifying learning objectives is critical in an ID process. Gustafson and Branch (1997) pointed out that all of the instructional systems design (ISD) approaches determine a learning objective, which is a very necessary component of the entire design process. All of the five phases of ADDIE are presented in a linear manner. According to Reiser and Dempsey (2007), throughout the life of a design project, data are collected and the development team evaluates these data, gaining insights into them. During this process, "it is often necessary to move back and forth among the activities of analysis, design, and formative evaluation and revision. Therefore, the iterative and self-correcting nature of the ID process emerges as one of [ADDIE's] greatest strengths" (p. 11). It is thus undoubtedly that ADDIE stands out as a solid design guide to an array of preceding and current ID models (Reiser & Dempsey, 2007) not only in the field of second language acquisition and teaching—the focus of this study—but across disciplines, as well.

IMPACT OF TECHNOLOGY SUPPORTED ID PRACTICES ON MASTERY LEARNING

Effective instruction is facilitated by solid design approaches that play a crucial role in the way instruction is delivered to a particular group of learners. The process of ID cannot be considered without guiding principles of instruction, models, and certain theories. Instructors' own epistemological perspectives, combined with their knowledge of certain psychological and theoretical frameworks often lay the foundation for the extent to which they create innovative and ingenious instructional products for their learners. Merrill (2002) stressed that instructors' knowledge of first principles of instruction can tremendously help them with the design of instruction which is learner-centered and based on solving real-world problems. Reiser and Dempsey (2007) asserted that instruction can emerge as effective, efficient, engaging, interactive—and even fun—in learning contexts where existing knowledge is the propeller of the new one, when it is integrated into students' world, when it is demonstrated to them as they gain mastery of their own learning (Gagne et al., 2005), and when they end up applying their newly acquired knowledge in real-life settings. Defining students' learning styles prior to the design of instruction can be a good reference point for designers who strive to achieve their students' mastery in learning. Under this context, educational technology emerges as an indispensable part of such instructional practices, building a bridge between traditional and progressive teaching approaches and activities. Van Merriënboer (1997) emphasized that instructors can positively influence learning outcomes in a given context if they lead their learners to gain complex cognitive skills, and if audiovisual technologies are made a substantial aid in this process.

A COLLABORATIVE CURRICULUM DESIGN TOOL (CCDT)

CCDT can be described as an online, interactive design tool utilized to craft effective curricula, unit lessons, or other instructional products (see Figure 1). It is a tech-savvy tool that helps educators share their designs with their colleagues or other educators—not with learners—via a common platform, which lends itself to a collaborative environment of sharing theoretical frameworks, learning and pedagogical approaches, as well as hands-on instructional practices with one another. Easy access and clear interface of the tool makes design engaging and fun for educators as they weave their pattern by using each of the following components under the *Teaching for Understanding* (TfU) framework: Throughlines, Generative Topics, Understanding Goals (UGs), Performances of Understanding (PoUs), Ongoing Assessments (OAs), and other essential elements. Overall, CCDT helps facilitate instruction in any discipline and in any educational, training, or professional development setting. By use of CCDT, instructors, instructional/curriculum designers, trainers, educational technologists, and all others interested in creating innovative, effective, and engaging instructional materials for their learner groups can easily create and access an account for their course on the web. They can also continuously edit their design work through this platform, and after finalizing it, they can electronically publish the completed design work, which is similar to Google Drive or Cloud platform—yet a less complicated one—in the virtual environment. In

other words, instructors using CCDT do not need to be concerned about losing their design work, for they will not be saving their design work on a hard drive.

The particular unit lesson created via CCDT for the purposes of this paper focuses on a content-based, academic adult ESL course. However, as noted earlier, CCDT can be effectively and efficiently used across disciplines by those involved in creating innovative and authentic educational products designed, developed, delivered, and evaluated with a myriad of technologies. The learning objective with a unit lesson or curriculum created with CCDT and under the guiding principles of the TfU framework almost always proves that target learners can gain a comprehensive understanding of the topic covered throughout the course. Moreover, it is also noteworthy that there are two particular advantages of implementing CCDT for an effective unit lesson before, during, and after its creation: 1) Due to the linear and systematic nature of the TfU framework, CCDT guides educators and other learning/teaching agents in their own fields with clear guidelines and a sound pattern (i.e., lesson plan, syllabus, curriculum, etc.), which they can easily follow in a certain learning/teaching environment; 2) The tool also assists design creators with building or developing ID skills necessary to create learning/teaching settings that are collaborative and authentic for specific learner groups. It is pivotal that designers keep all of these features and the central elements of CCDT in mind, especially due to the benefits it provides the educators with in the process of achieving specific learning goals they set for their learners—for the purposes of this paper, adult ESL teachers, in particular. Thus, this paper highlights the characteristics—or the three Ps of CCDT—a practical, progressive, and participatory curriculum design tool. It is also imperative that second language educators appreciate CCDT's conformity with theoretical and pedagogical principles addressed in this paper, as well as its congruence with currently popular ID models and computer aided ESL instruction. Therefore, educators who desire to transcend their current instructional practices with educational technologies can substantially benefit from CCDT, which, for the purposes of this paper, was portrayed as a knowledge-building, innovative, tech-savvy ID tool hoped to be a beacon to ESL instructors, to those working in the field of second language acquisition supported with technologies, or to individuals engaged in the field of education that simply desire to create instructional products that can emerge as highly engaging, meaningful, and fun for their students.

Figure 1. An Exemplary Unit Lesson Designed with the Collaborative Curriculum Design Tool (CCDT)

ccdt
Wide World's collaborative curriculum design tool

HARVARD GRADUATE SCHOOL OF EDUCATION

home help MyWIDE Logout

DESIGN LIST preferences video tutorial

Welcome Seda !
Your last visit to the site occurred on April 7, 2015 at 5:54 PM.


Below is a list of your available designs. You can sort the list by design name, design owner, or last modification date by clicking on "name", "design owner", or "date modified." If you are the owner of a design, you can also rename, duplicate, or delete that design.

To return to your design list, you can click on the CCDT logo at any point.

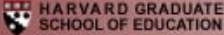
create new design create new folder

design list ?			
name	design owner	date modified	
CMI & Constructing Meaning in an Adult ESL Course	Khadimally, Seda	December 22, 2014 (11:43 PM)	[remove]

create new design create new folder



Wide World's collaborative curriculum design tool



[home](#)
[help](#)
[MyWIDE](#)
[Logout](#)

DESIGN

collaborate

export

DESIGN WORK

classify items

associate items






file list

design history

design work

This page is a starting point for editing your design. You may choose from the activities located in the icon bar below. Place your mouse over the icons in the icon bar below to view the actions you can perform from this page.


[Teaching for Understanding How-To Guide](#)

 collapse
  linear view
  edit
  delete
  add

CMI & Constructing Meaning in an Adult ESL Course ?


☐ **Throughlines (1)** ?

☐ "I want my students to understand..."

 add

☐ **Generative Topics (1)** ?

☐ Teaching Adult ESL Learners with Emerging Technologies & The Role of CMI in HPI

 add

☐ **Unit Level Understanding Goals (5)** ? 12 reorder


☐ UG1: Knowledge Goals

☐ UG2: Processes

☐ UG3: Methods Goals

☐ UG4: Purpose Goals

☐ UG5: Forms Goals

 add

The screenshot displays a user interface for an instructional product. It features several expandable modules, each with a title, a count in parentheses, and a question mark icon. The modules are:

- Performances of Understanding (1)**: Contains a checkbox for "Culminating Performances via the AC4 Online Lab to Understand and Apply War-related Vocabulary" and an "add" button.
- Ongoing Assessment (3)**: Contains checkboxes for "Tiered Activities via AC4 Online Course: Activity 1", "Activity 2", and "Activity 3", along with an "add" button and a "reorder" button.
- Blank Pages (1)**: Contains a checkbox for "THE NARRATIVE: How This Design Contributes to Students' Learning Based on Constructivism and ADDIE" and an "add" button.
- Resource (7)**: Contains checkboxes for "Teacher Infographics on Highly Effective Teachers (from Pinterest)", "Bloom's Digital Taxonomy (from Pinterest)", "References Used in this Design", "PREZI: For Demonstration of this Instructional Design", "Wordle (for Word Clouds)", "Visual Thesaurus for Synonymous & Antonyms", and "Learn That (For Root Words & Prefixes)", along with an "add" button.
- Standards (1)**: Contains a checkbox for "Standards" and an "add" button.

At the bottom of the interface is a toolbar with icons for "collapse", "linear view", "edit", "delete", and "add".

Figure 1. This visual demonstrates an example of an instructional product designed through CCDT for a group of ESL learners. Each module (i.e., throughlines, generative topics, performances of understanding, ongoing assessment, and other components) embedded under the TfU framework includes unit-level content and leads to a deeper and holistic understanding of the unit designed for meaningful learning.

THROUGHLINES

In this unit, all activities were tiered and differentiated, based on the ESL students' learning domains (Bloom, 1968), styles, interests, and readiness levels. Addressing these criteria can help the students figure out how effectively and efficiently they grasped the generative topic, *Fighting Infectious Diseases*, in unit 7, *Microbiology*, by using *war* as a metaphor. They are expected to appreciate the differences among battle-related

vocabulary embedded in the unit. The most important thing for the students to understand about this topic is the subtle nuances among each war-related word such as battle against, wage a war against, be overcome, combat, attack, first line of defense, keep a disease under control, contain, be out of control, outbreak of a disease, be vulnerable to, and be susceptible to a disease.

Through lines (see Figure 2) allow the ESL teacher of this academic English course to set the following learning objectives for her students. Below is the list of these goals and expectations that the educator of this design most wants her students to understand at the end of this 6-week ESL course:

1. Students will internalize their knowledge in the academic topic in unit 7 (i.e., Microbiology), *Fighting Infectious Diseases*, and construct their own meanings from this topic;
2. By using asynchronous and synchronous technologies, the students will engage in an interactive learning environment where they will not only interact and communicate with the instructor, but also with their peers. Technology supported learning will help the students understand the meaning and value of communication in a student-faculty and faculty-faculty interaction (Reiser & Dempsey, 2007). At the end of the unit under study, (i.e., Microbiology), all students will also be able to demonstrate enhanced fluency in writing and listening. They will additionally build on their advanced academic vocabulary repertoire. As the instructor encourages her students to utilize a variety of technological tools both inside and outside of the classroom, she wants her students to make their own meanings from the topic. As they construct their own meanings from the given subject matter over the course of six weeks, students will eventually become self-directed, intrinsically motivated learners (Vygotsky, 1978). As she provides them with an array of authentic learning/teaching materials in vocabulary, reading, writing, listening, and speaking competencies, her students will use various educational technologies during this learning process. With this type of instruction, she wants her students to transform into constructivist learners apt to build authentic meanings, which can lead to their discovery of a type of instruction that is effective, fun, engaging, efficient, and appealing (Reiser & Dempsey, 2007) for themselves.

Figure 2. Throughlines

CMI & Constructing Meaning in an Adult ESL Course ?	
item name:	"I want my students to understand..." feedback view versions
element type:	Throughlines ?
item content:	Unit 7: Microbiology (Unit Curriculum Design) Topic: "Fighting Infectious Diseases" Generative Topic: War-related Academic Vocabulary Target Audience: Adult ESL Students (Adult Education) Level: High-Intermediate to Low Advanced Activity: Tiered Activities based on a Metaphor: War Main Learning Resources: Academic Connections 4 (AC4) Textbook and AC4 Online course (The AC4 Online Lab)

Figure 2. With these overarching goals, the students are expected to develop a deeper understanding of the content from the given unit (i.e., Unit 7: Microbiology) and the particular topic, *Fighting Infectious Diseases*. Throughlines will be closely related to the Understanding Goals (UGs) for this specific unit and vice versa.

3. The ESL instructor wants her students to acquire all skills in English through the use of below educational technologies:

ePortfolios involving digital videos, creating personal narrative videos they can edit and publish (e.g., iMovie, Microsoft Office, YouTube, Final Cut Pro, etc.), designing blogs and wikis, using the word cloud tool Wordle (see Figure 3), and online dictionaries such as Visual Thesaurus, JTW, etc.—so they can build upon their advanced academic vocabulary skills—designing interactive presentations with Prezi, Microsoft PPT, or Adobe Presenter, using social networking tools such as FaceTime, LINE, Google Chat, Skype, Adobe Connect, Lexly, Twitter, and Facebook in order to socially connect.

Figure 3. Unit 7 Vocabulary Words via Wordle.net, an Online Word Cloud Tool



Figure 3. By use of this tool, the most frequently used advanced academic words derived from the unit vocabulary are designed and presented to ESL students in a way that they will gradually begin to digest these words, and build upon them as they engage in various vocabulary, reading, writing, listening, and speaking activities and tests. What stands out by use of this technology is that the students will ultimately end up mastering academic vocabulary pertinent to the topic, *Fighting Infectious Diseases*.

4. The instructor also wants her students to showcase their knowledge with a culminating digital portfolio project at the end of this unit. By preparing an e-Portfolio, students can demonstrate their performances in various skills in the English language, based on their thorough understanding of topics. With this project, they can display their newly gained knowledge of the unit vocabulary words, in addition to their writing, listening, and speaking competencies (see Figure 4 for assessment of ESL students' speaking fluency).

Figure 4. Oral Presentation Assessment Rubric

~Oral Presentation Assessment Rubric~				
Unit 7: Microbiology				
Topic: How to Prevent the Spread of Infectious Diseases				
CATEGORY	Excellent (4)	Very Good (3)	Good (2)	Fair (1)
Vocabulary	Vocabulary is generally accurate and appropriate to the task; minor errors, hesitations may occur.	Vocabulary is usually accurate; errors, hesitation may be frequent.	Vocabulary is not extensive enough for the task; inaccuracies or repetition may be frequent.	Vocabulary is inadequate for the most basic aspects of the task.
Grammar	Grammar may contain some inaccuracies, but these do not negatively affect comprehensibility.	Some grammatical inaccuracies may affect comprehensibility; some control of major patterns.	Many grammatical inaccuracies may affect comprehensibility; little control of major patterns.	Almost all grammatical patterns inaccurate except for a few memorized patterns.
Pronunciation	Issues are completely or almost completely comprehensible; errors, rhythm and/or intonation problems do not create misunderstandings.	Issues are generally comprehensible, but pronunciation errors, rhythm and/or intonation problems may create misunderstandings.	Issues are difficult to comprehend because of numerous pronunciation errors, rhythm, and intonation problems.	Issues are practically incomprehensible
Preparedness	Students are completely prepared for the topic, and obviously rehearsed.	Students seem pretty prepared for the topic, but might have needed a couple of more rehearsals.	Students are somewhat prepared for the topic, but it is clear that rehearsal was lacking.	Students do not seem at all prepared for the topic to present.
Content	Students show a full understanding of the topic.	Students show a good understanding of the topic.	Students show a good understanding of parts of the topic.	Students do not seem to understand the topic very well
Posture and Eye Contact	Students stand up straight, look relaxed and confident. They establish eye contact with everyone in the room during the presentation.	Students stand up straight and establish eye contact with everyone in the room during the presentation.	Students sometimes stand up straight and establish eye contact.	Students slouch and/or do not look at people during the presentation.

Figure 4. ESL students' speaking skills regarding unit-related topic, *How to Prevent the Spread of Infectious Diseases*, are assessed based on the given rubric criteria—from fair to excellent.

5. The instructor of this academic English course finally wants her students to socially interact with both their peers and herself, by sharing a common culture of both content and method, and thus build a knowledge-building community of ESL learners. Gagne et al. (2005) stressed that group-based, interactive instruction helps students connect and build a community of digital learners in today's world of technology.

Through Grouping:

- A. The students will derive context-related meanings of academic words, and appreciate what metaphorical use of the language is;
- B. They will appreciate the application of war/battle-related vocabulary in real-life settings;
- C. The students will also develop an understanding of certain grammatical structures used to facilitate their academic vocabulary use in context and writing activities.

GENERATIVE TOPICS

The unit topic to be taught in this six-week course is *Fighting Infectious Diseases* in unit 7. There are eight units in sequence in the textbook, *Academic Connections 4 (AC4)*. The textbook involves a built-in online lab (AC4 online), which is an interactive course that provides a variety of skills-based activities to ESL students in all units. The course will heavily rely on supplemental activities through Computer-Mediated Instruction (CMI). The online course will provide the ESL students with hands-on applications as they acquire and implement vocabulary skills, reading, writing, listening, and speaking. All students will benefit from the AC4 online course, which is expected to yield higher learning outcomes in all aforementioned skills. CMI is effective particularly on reading, vocabulary, listening, and speaking fluency. During the design and implementation of this unit curriculum, the instructor will be aware of the fact that technology has a highly positive impact on second language acquisition. Unit instruction via CMI will particularly be critical for her ESL students, for they can more easily—and audio visually—scaffold their learning in each learning domain every time they come across a new concept or expression throughout their progress in this unit (i.e., Microbiology). This will greatly contribute to their performance improvement (Gagne et al., 2005), as competent language learners. CMI will also assist the students as they associate each term with their previous experiences, and thus construct their own meanings (Vygotsky, 1978; Reiser & Dempsey, 2007) from within the subject matter.

The instructor's hands-on use of this online lab and getting her students to perform activities both inside and outside of the classroom environment will greatly contribute to their mastery learning (Bloom, 1968, as cited in Gagne et al., 2005). With respect to this, it is imperative that educators remember that in a digital world of learning and teaching, they must design and evaluate programs that promote students' mastery learning in given tasks and learning objectives. Indeed, from a scholastic point of view, these should be educational programs consistent with progressive learning styles of the millenials (Dede, 2011). Also, from an instructional viewpoint, Gagne et al. (2005) pointed out that "the idea of mastery requires a change in thinking about instructional design as well as assessment" (Bloom, 1968, as cited in Gagne et al., 2005, p. 274), which is exactly what the instructor of this course seeks to accomplish on her part with her curriculum design both during and after the course completion. Especially that she incorporates the technology component of the AC4 course into her students' learning processes will be a substantial aid for her students' *performance improvement* (Reiser & Dempsey, 2007). She is particularly cognizant of the fact that Human Performance Improvement (HPI) or Human Performance Technology (HPT) is a "special field that has evolved professionally in the last 15 years, and can assist individuals and organizations to achieve workplace success" (Reiser & Dempsey, 2007, p. 143). Online technologies that she will employ together with her students throughout the unit (i.e., Microbiology) will solidify her students' appreciation for the value of all generative topics. Use of AC4 will considerably help her learner group to enhance and improve their academic performances in all English skills, which is highly consistent with the guidelines of the HPI/HPT ID model (Reiser & Dempsey, 2007).

Defining an infectious and a contagious disease, and the subtle differences between the two terms will be one of the foci during academic vocabulary activities. Other generative topics relevant to the unit will be acquisition of and resistance or sensitivity to infectious diseases, and the ways to avoid or avert the process that occurs in everyday life. In this context, such generative topics will help the course instructor's students appreciate how germane the topic is in today's world. Other generative topics will involve students' comprehension of and differentiation among the following vocabulary words: pathogens, contract infectious diseases, epidemic, pandemic, symptom, syndrome, resist, susceptible, vulnerable, vaccination, and several others in both the AC4 textbook and AC4 online lab.

With this unit design, the students will also learn about other pertinent vocabulary regarding humans' combat with infectious or communicable diseases (e.g., battle, wage a war against, overcome, attack, first line of defense against, keep under control, resist, etc.). They will also understand speakers' main discussion points as they listen to unit related lectures. They will comprehensively grasp the entire content with reading passages about the topic.

This unit is worth learning, because the students will not only understand content-based academic skills, unit concepts and technical terminology, and acquire better listening skills, but will also be able to debate (i.e.,

speaking skills) on the topic, and write on subtopics that revolve around humans' fight against infectious diseases in real-life. This is worth learning, for, at the end of this unit, students can acquire academic content knowledge enriched with several authentic integrated skills tasks, especially designed for proficiency in the writing and speaking domain. Such an integrated skills approach to their learning will contribute to their understanding, application, evaluation, and critique of real-life cases that occur in today's world.

This lesson is also important for adult ESL students to learn, for by use of emerging educational technologies, they can gradually build upon their newly acquired knowledge of all skills in the language English, which is highly congruent with 21st century digital literacies. The course teacher's instructional practices are particularly critical to support the students' knowledge-building process, because she will initially begin to deliver the academic content via scaffolding her students' learning, and as they improve their understanding and practice of the subject matter, she will gradually let them learn the subject matter on their own; a learning/teaching approach that highly aligns with the constructivist learning pedagogy (Vygotsky, 1978). From an ID viewpoint, another note on the importance of teaching this unit lesson to adult ESL students is that the entire life cycle of this CCDT-generated design work will be predominantly guided by the principles of ADDIE.

Under these particular generative topics, teaching English to speakers of other languages (TESOL) is especially critical—and very timely in the current digital age. Since the English learners in this academic course are adults, appealing to their needs with appropriate technologies, and helping them transform into self-directed learners (Knowles, 1970) could be a real challenge on the part of the instructor. With that in mind, she will deliver the above mentioned generative topics to her learner group with authentic, effective, and engaging (Reiser & Dempsey, 2007) activities supported with a variety of technologies. In order to overcome such potential challenges, and as mentioned earlier, she will base her curriculum on the ADDIE ID framework. Especially the first stage (i.e., analysis) of ADDIE helped the instructor create a *needs analysis survey* (see Figure 5), which she designed with SurveyMonkey. In the conduct of this survey, she collected essential data from her colleagues at school, by sending them an online survey link. This survey simply demonstrated the technology needs of ESL teachers at school. She then designed her weekly syllabi based upon the data she derived from this analysis. The data she collected demonstrated that some of the necessary technology tools are already utilized by teachers both inside and outside of the classroom while some others are not. Thus, the data reported by majority of ESL teachers showed that all teachers needed to be on board as far as their use of cutting-edge technologies in class and in terms of the school administration's attitude toward and encouragement of their use of innovative, digital tools both inside and outside of class. Gagne et al. (2005) contended that instructors need to keep up with the pace of emerging instructional technologies in today's digital world. Taking this into consideration, as she designed this unit lesson, the course instructor began to implement some of the less frequently used and yet popular technologies. With the completion of this academic English course, she will go through all components of CCDT under the TfU framework, and thus further evaluate the extent to which—or how effectively and efficiently—she incorporated these online tools into her teaching this unit lesson. That will be demonstrated under PoUs of this design work.

Figure 5. Technology Needs Analysis Survey for ESL Teachers

ESL Teacher Needs with Technology

***1. Please write your name in the box below. Also, which level and class are you teaching this session? Please specify.**

***2. Which one below do you believe best describes your implementation of technology in your classroom?**

☐ Exceptional
 ☐ Very Good
 ☐ Good
 ☐ Fair

***3. I feel that technology training provided by my program is, in general, _____ on my teaching, and especially on the way I tailor my instructions toward my students' learning needs.**

☐ Extremely effective
 ☐ Very effective
 ☐ Moderately effective
 ☐ Ineffective and inadequate

Other (please specify)

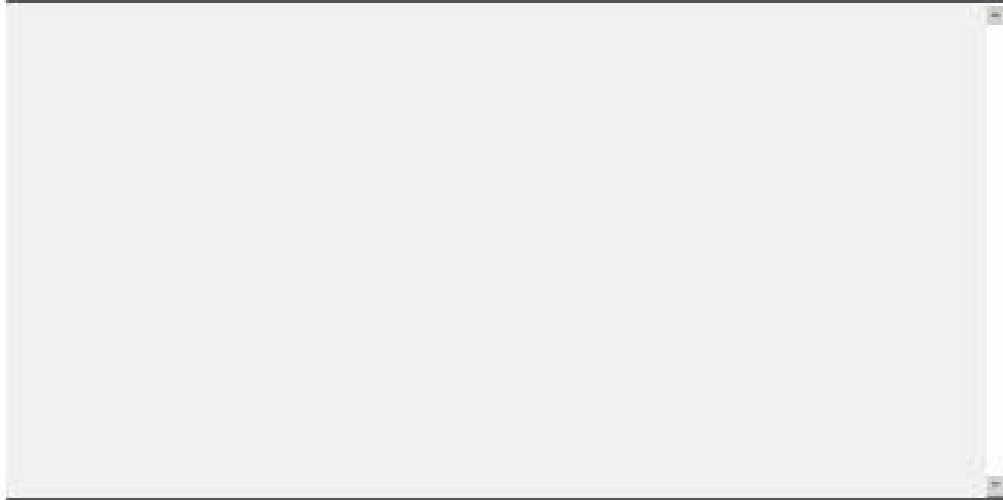
ESL Teacher Needs with Technology

* A. Dear teacher,

Please choose one or more of the questions below and respond in detail. Your sincere response in this question will immensely affect our decision-making process toward developing a training program solely geared toward your technology needs.

Thank you!

Describe where you see yourself in terms of your in-class technology use. What do you believe your technology needs are, as an instructor? Do you think that your students' learning expectations in your class are fulfilled without a collective use of technologies in class--or outside of the class? Have you ever conversed with students in your class, in need of technology-supported ESL learning? If so, share with us. Do you feel that your students' learning needs can often be met with the current techniques with which you have taught so far? Why/Why not? Do you see yourself as a tech-savvy ESL instructor? If not, why not? Please explain what your needs are with regard to your technology needs in your teaching? What specific software tools would you like to learn about and then practice with your students in your class? Your specific answers in this section will greatly help us provide you with the best technology training possible.



ESL Teacher Needs with Technology

*** 5. On a typical day of instruction, I make effort to use the computer in my classroom**

_____ :

- ☐ Everyday of the learning/teaching week
- ☐ Every three days of the learning/teaching week
- ☐ Less than three days of the learning/teaching week
- ☐ Almost never—I really do not need to use it in my class.

☐ Additional comments on frequency of your in-class technology use

*** 6. When I am not teaching, I often use the Internet in order to _____ :**

- ☐ collect instructional data or resources for my students
- ☐ retrieve data for my side projects
- ☐ retrieve information that might assist my teaching
- ☐ prepare lesson plans or design curricular materials
- ☐ surf for self-enrichment and extracurricular activities
- ☐ Just for fun

Other (please specify)

*** 7. As I practice online technologies or other software in my classroom teaching, I feel**

_____ :

- ☐ extremely comfortable and do not need administrative help or that from other teachers
- ☐ moderately confident and might sometimes need administrative help or that from other teachers
- ☐ slightly confident and often need help from the administrator or from other teachers
- ☐ uncomfortable and always need help from the administrator or from other teachers

Other (please specify)

ESL Teacher Needs with Technology

*8. On a 1 to 5 scale, what do you think your students' perceptions are about your technology implementations during both onsite and online teaching, if any?

Ranking: 5=Excellent; 4=Very Good; 3=Good; 2=Weak; 1=My teacher seems to be totally lost

- ☐ 5
- ☐ 5-4
- ☐ 4
- ☐ 4-3
- ☐ 3
- ☐ 3-2
- ☐ 2
- ☐ 2-1
- ☐ 1

ESL Teacher Needs with Technology

***9. What classroom technologies (i.e., online software, built-in software, etc.) do you usually implement in your teaching? Choose one or more possible answers from below:**

- ☐ Online dictionaries
- ☐ Online journals, articles, periodicals
- ☐ Web sites useful for listening & speaking activities (e.g., YouTube, NPR, BBC, etc.)
- ☐ Audiovisual tools (e.g., Audacity, Text-to-Speech software, etc.)
- ☐ Other voice recorders ("please write the names in the comments section of this question")
- ☐ Adobe PDF or Photoshop
- ☐ Microsoft PowerPoint
- ☐ Exchange ideas or send feedback to my students via Microsoft Word Review Pane or other similar software
- ☐ Wiki
- ☐ Blogs
- ☐ Online discussion groups
- ☐ Online class portals (i.e., course management/learning systems like OWL-Space, Sakai, WebCT, Blackboard, etc.)
- ☐ Synchronous communication tools (i.e., Skype, instant messaging on MSN or Google, etc.)
- ☐ Google docs
- ☐ Visual Graphic Organizers
- ☐ I only use TeacherShare Drive in the teachers' room and send/receive emails on a daily basis
- ☐ Other (please specify)

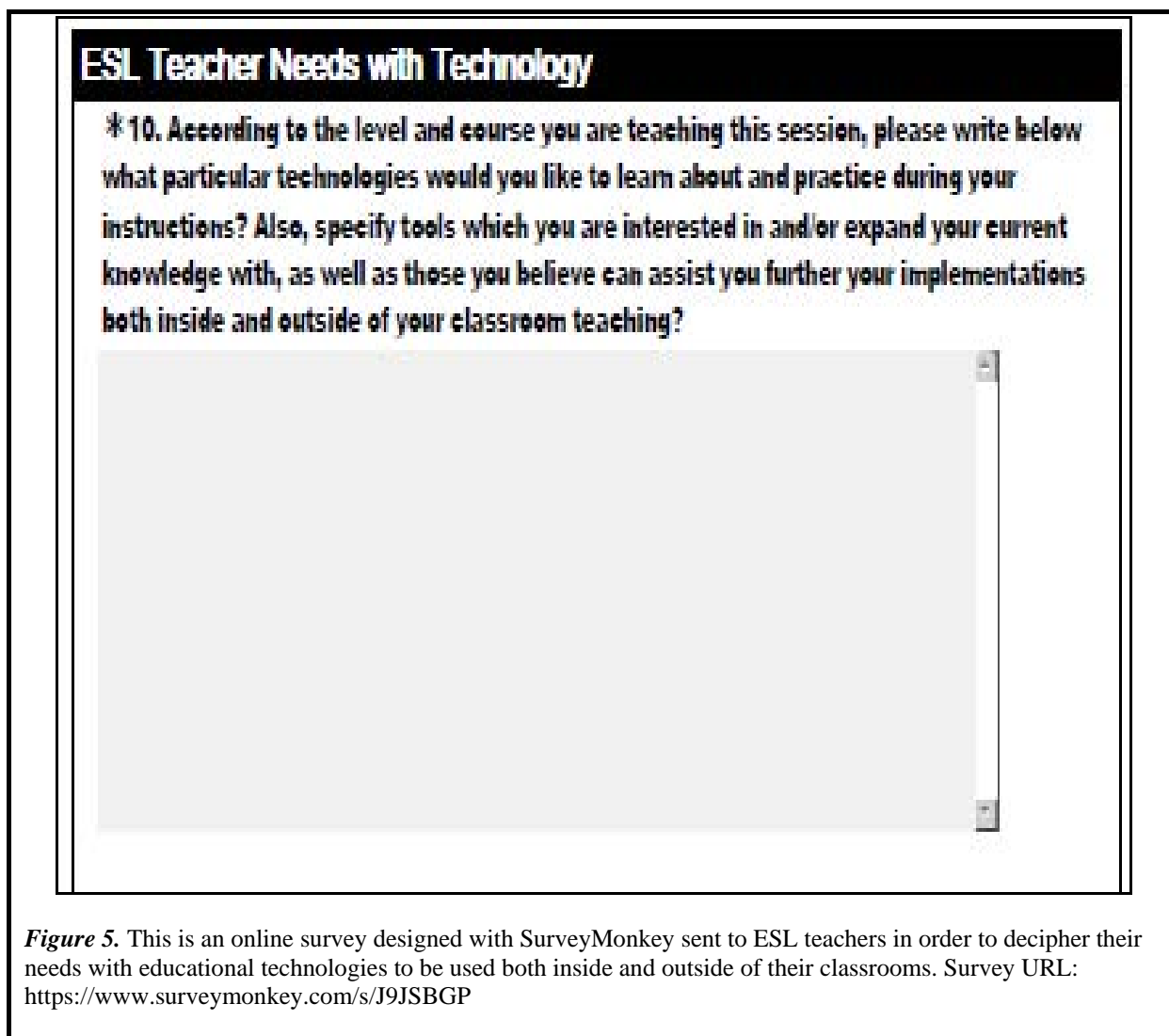


Figure 5. This is an online survey designed with SurveyMonkey sent to ESL teachers in order to decipher their needs with educational technologies to be used both inside and outside of their classrooms. Survey URL: <https://www.surveymonkey.com/s/J9JSBGP>

UNIT LEVEL UNDERSTANDING GOALS (UGs)

UG1: KNOWLEDGE GOALS

Based on the generative topic of this unit, How to Avert the Spread of Infectious Diseases, the students will develop an understanding of the war-related academic vocabulary.

The first learning goal in this unit (i.e., Microbiology) is to ensure that advanced level ESL students extensively understand and acquire the sophisticated vocabulary words, concepts, expressions, and all of the technical terminology necessary to apply in real-life cases. Knowledge goals align with one of Benjamin Bloom's (1968) educational objectives under the following cognitive domain: knowledge. With knowledge goals, the ESL students in this course will transform into self-driven, intrinsically-motivated learners, which will ultimately affect their achievement levels during our educational activities. Students' metacognitive knowledge about what they know, or self-efficacy with which they can develop about their own learning (Ormrod, 2008) will lead them to extrapolation of what context-based readings, lectures, oral and written expressions, concepts and expressions will mean to them. The students will eventually gain mastery in deriving and constructing their own meanings from within the related texts and terms. By performing integrated tasks on the online course, AC4 online, students will better develop their acquisition of four skills in English, by focusing on humans' combat with contagious diseases in real-life settings.

UG2: PROCESSES

After a list of Microbiology-related vocabulary words is handed out to the students, those consistent with the reading and listening excerpts (see Figure 6) built both in the text book, Academic Connections 4 (AC4) and also in its interactive, online course (AC4 Online) will be covered. Next, topic-related passages will be read, and vignettes with their transcripts will be audibly presented to them. Throughout this process, the students will be

asked to review this vocabulary list, so their vocabulary skills can be assessed with a quick vocabulary test. Students are then to internalize some of the technical words necessary for them to be able to write a 5-paragraph process essay about the topic, which will be their culminating writing project as the topic is concluded. The topic title of this take-home writing assignment will be as follows: *How to Avoid the Spread of Infectious Diseases*. Meanwhile, the students will be additionally assigned to complete take-home, online listening quizzes, which they can take via the AC4 online, interactive course.

Figure 6. A Listening Activity from the Online Lab

7.2.6 Listening Activity 3 Submit For Grading

Listen to the passage. Choose the correct phrases to complete the text.

cause of disease of infected with treated simply by
caused by essential to lead to

1) A clean water supply and efficient water treatment are [] preventing all kinds of illnesses. Our water systems can contain parasites that [] schistosomiasis. Schi-sto-so-mia-sis, which is a disease that damages the bladder, the kidney, the liver, and the intestines. The World Health Organization estimates that 200 million people may be [] the parasite and that 200,000 die every year. Now, food preparation also affects our health. Gastroenteritis, ga-stro-en-te-r-i-tis, which is a [] the stomach and the intestines, is [] improperly prepared foods, reheated meat and seafood dishes, dairy and bakery products. The WHO states that gastroenteritis kills five to eight million people per year, and is the leading [] death for children under the age of five. This, when gastroenteritis can be [] rehydration.

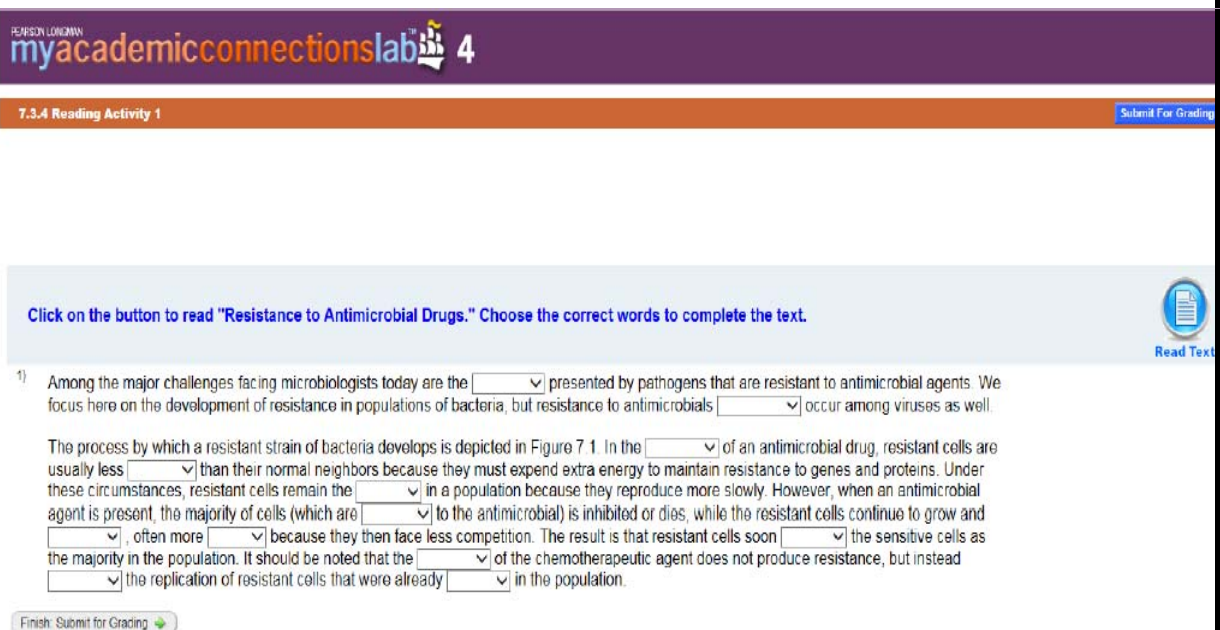
Finish: Submit for Grading

Figure 6. This is an online, interactive listening activity from the online lab (i.e., AC4 online), which assists with assessing ESL students' understanding of the content of Unit 7 (i.e., Microbiology).

UG3: METHODS GOALS

ESL students will understand the purpose and implementation of all of the aforementioned educational technology tools commonly used for exploration, comprehension, demonstration, knowledge, acquisition, application, analysis, synthesis with alternative solutions, and evaluation (Bloom, 1968). With online, interactive tests on AC4 site (see Figure 7 for an exemplary reading activity), the students will especially appreciate the similarities and differences between specific Microbiology-related terms and/or expressions, such as between infection and contagion, or among vulnerable to, resistant to, susceptible to, sensitive to, symptom, syndrome, attack, battle against, be overcome, combat, fight, epidemic, pandemic, etc.

Figure 7. A Reading Activity from the Online Lab



The screenshot shows the 'myacademicconnections lab 4' interface. At the top, it says '7.3.4 Reading Activity 1' and 'Submit For Grading'. Below this, a blue box contains the instruction: 'Click on the button to read "Resistance to Antimicrobial Drugs." Choose the correct words to complete the text.' To the right of this box is a 'Read Text' button. The main text area contains a paragraph with several dropdown menus for selecting words. The paragraph discusses the challenges of antimicrobial resistance and the process of bacterial adaptation. At the bottom left, there is a 'Finish: Submit for Grading' button.

1) Among the major challenges facing microbiologists today are the presented by pathogens that are resistant to antimicrobial agents. We focus here on the development of resistance in populations of bacteria, but resistance to antimicrobials occur among viruses as well.

The process by which a resistant strain of bacteria develops is depicted in Figure 7.1. In the of an antimicrobial drug, resistant cells are usually less than their normal neighbors because they must expend extra energy to maintain resistance to genes and proteins. Under these circumstances, resistant cells remain the in a population because they reproduce more slowly. However, when an antimicrobial agent is present, the majority of cells (which are to the antimicrobial) is inhibited or dies, while the resistant cells continue to grow and , often more because they then face less competition. The result is that resistant cells soon the sensitive cells as the majority in the population. It should be noted that the of the chemotherapeutic agent does not produce resistance, but instead the replication of resistant cells that were already in the population.

Finish: Submit for Grading

Figure 7. The aim with this online, interactive reading activity is to support ESL students' thorough understanding of the topic, *Resistance to Antimicrobial Drugs*.

UG4: PURPOSE GOALS

Students will come to understand the reason why utilizing a variety of technologies both inside and outside of the classroom will substantially contribute to their comprehension, application, analyses, syntheses, and evaluation in the process of gaining mastery in all four fundamental skills (i.e., listening, speaking, reading, and writing) (Gagne et al., 2005). They will also realize to what extent technology supports them with directing their own learning and constructing their own meanings both individually with their peers together in the classroom. According to Reiser and Dempsey (2007), it is essential that effective instructors/trainers design instruction/training programs with which their learners/trainees can first identify and analyze the learning goals/objectives of the given content, with the purpose of understanding first their own learning needs and next the objectives of the instructional practices to be given. Gustafson and Branch (1997) pointed out that all ID approaches determine a learning objective, which is a very necessary component of the design process. Learners can then understand the particular content, only to prepare themselves toward integrating and applying their newly acquired knowledge into their current academic—or business-related—practices. Understanding the purpose of instruction is congruent with the major ID model of this unit curriculum design, ADDIE (Reiser & Dempsey, 2007).

UG5: FORMS GOALS

This unit curriculum design is empowered by the ADDIE (i.e., Analysis, Design, Development, Implementation, Evaluation) ID model (see Figure 8, retrieved from Gagne et al., 2005, p. 13), whose strength is being iterative and self-corrective.

Figure 8. ADDIE, a Highly Popular ID Model (Retrieved from Gagne et al., 2005, p. 13)

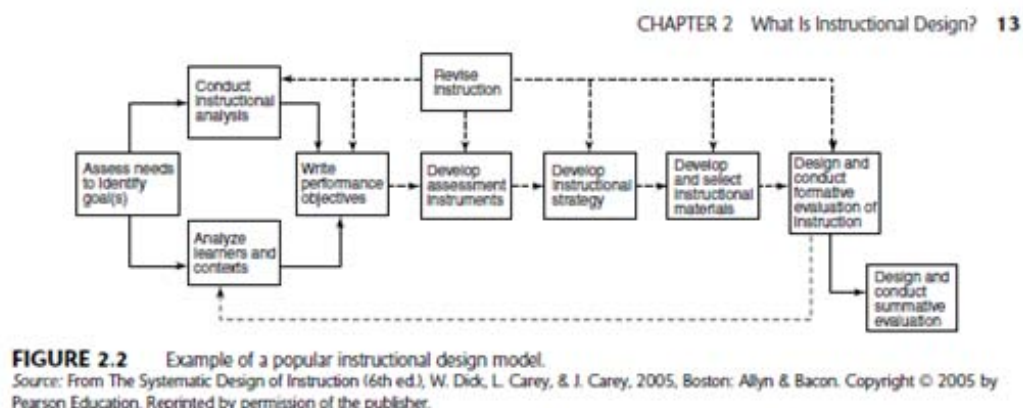


Figure 8. The chart above demonstrates a highly popular ID model in the process of designing, delivering, executing, and evaluating effective instruction. Drawing on the nature of ADDIE, the content of this unit design will be continuously modified and developed, which cannot be possible without the ESL students' corrective feedback at the end of the course (see section entitled *Performances of Understanding* of this design). Given that there is a specific problem and learning need (Gagne et al., 2005) that is to be addressed and rectified, which is that adult ESL students need to master their learning in all skills in English with support of CMI, this particular unit curriculum design was created with the expectation that it can address this issue.

The design involves a highly sophisticated academic vocabulary repertoire for adult ESL students, who fall under a certain age group and educational level. Within this age range and educational level, the students study English as they prepare to go to undergraduate or graduate schools in the U.S. As such, designing this unit consistent with the principles of instruction under the ADDIE model and constructivist learning framework was the primary goal, which can greatly assist with the students' learning for understanding. Such a learning goal can lead one to deeply comprehend and appreciate the epistemological, philosophical, and pedagogical underpinnings of the design.

From an academic viewpoint, with this unit design, students will understand how to use each online module in the AC4 online Lab in order to take various integrated skills tasks such as in writing and speaking, and to master their performances on what they have learnt about the topic, Microbiology throughout the course. Gagne et al. (2005) pointed out that “the idea of mastery requires a change in thinking about instructional design as well as assessment” (Bloom, 1968, as cited in Gagne et al., 2005, p. 274). AC4 Online course is a proper mode and rate of instruction in this adult ESL course as far as all of the understanding goals are concerned, because of two reasons:

1. AC4 Online Lab will not only help ESL students master their own learning throughout the course, but also lead them to get more hands-on with it than ever before;
2. The instructor of this course can more conveniently engage in further instructional practices each time she provides her students with feedback on their academic performances. Also, she can practice further assessments and evaluations—and for her program—which, in turn, can explain the degree to which AC4 online is a very powerful mode of CMI. The impact of AC4 online courseware can be felt both by the instructor and students of this course, especially when the ADDIE ID principles are taken into account (Reiser & Dempsey, 2007).

PERFORMANCES OF UNDERSTANDING (PoUs): CULMINATING PERFORMANCES VIA AC4 ONLINE LAB TOWARD UNDERSTANDING AND APPLICATION OF WAR-RELATED VOCABULARY

Over the course of six weeks, ESL students will understand and apply different meanings of war-related vocabulary in the Microbiology unit, wherein they will learn about how they can fight diseases that are infectious. The students will also culminate their performances, by giving an individual 5-minute impromptu speech in class or a 15-minute group-based oral report which they are to prepare at home, so they can showcase in class at the end of the unit. The learning goal with such impromptu speaking assignments is to help the students demonstrate their comprehensive understanding of the topic. As they showcase their culminating performances both during the semester and at the end of the course, students can go to YouTube and make their own videos by storytelling/narrating. They can also produce movies by using iMovie or other related movie making software. They can additionally design word clouds through tools such as Wordle.net. Furthermore, the students can create blogs and wikis where they can upload several materials regarding Microbiology-related expressions and then demonstrate them in class. They can also build mind/concept maps with a mind mapping tool such as Inspiration.com, while using online synonymys and antonyms dictionaries such as Visual Thesaurus.com or dictionaries such as just-the-word.com (JTW), or wordandphrase.info/frequencyList.asp. For showcasing the root words and prefixes of academic vocabulary they will learn until the end of this six-week course, they can additionally refer to learnthat.org and several such other web sites.

There are additional technologies by which ESL students in this course can perform their learning, such as PPT (Microsoft Office), Prezi.com (via web), Google Drive, Google Chat, WordPress.Org (for Blogs), Wetpaint.com (for Wikis), Skype, Face Time, LINE, and various other applications for voice and video calls. The fact that the students can find the opportunity to create their own designs, vocabulary lists, slides, wikis, and blogs both audibly and visually will help them excel at their learning at the end of the unit (i.e., Microbiology). These PoUs will be engaging, interactive, and fun for all students. Mastery learning (Gagne et al., 2005) with such creative and original PoUs will prove to have an effective, efficient, appealing (Reiser & Dempsey, 2007), ingenious, and authentic impact on instruction not only tailored toward this particular group of adult ESL learners, but also for further groups in future instructional practices, as well. Based on the principles of ADDIE, AC4 Online lab and such innovative technologies can help the students achieve both content and skills-based mastery. Reiser and Dempsey (2007) pointed out under the guidelines of ADDIE that searching for proper modes and rates of instruction with which mastery learning can be achieved is what effective instructors and trainers should do. With that in mind, this instructional design should yield effective instruction and considerably assist with all students' performances.

At the end of each showcase, each of the students will be provided with individual—and corrective—feedback both in one-on-one settings and in groups. Reiser and Dempsey (2007) emphasized the vitality of providing corrective feedback to learners, instead of one given in a right or wrong format. Next, following round-table discussions and team-related activities, all students will find the opportunity to evaluate both their own performances (see Figure 9) and those of their classmates' with *self-reflection and peer-assessment sheets* (see Figures 10.1 & 10.2). Engaging in self-reflection will be highly beneficial to adults ESL students' cognitive development, for it will substantially help raise their self-efficacy and motivational levels, along with their improved learning beginning in this specific level (i.e., Level 6). Also, this type of reflection will be a vehicle for personalized information, demonstrating each student's subjective and sincere opinions both about their peers' and their own. Such data could not be possibly collected through faculty-to-student feedback. Therefore, reliable and valid information collected in the evaluation stage by use of multiple sources is an instructional objective for the ESL teacher instructing this course, a goal which is also consistent with the *evaluation* component of the ADDIE ID model.

Figure 9. Self-Reflection Sheet

Course: Academic Preparation
Unit 7 (Microbiology)
Topic: *Fighting Infectious Diseases*
Activity: Evaluation
Item: *Self-Reflection (in a To-Go Box®)*
Instruction: ~~Self-Reflection~~

Student name:

TO-GO BOX

In a short paragraph, please reflect on your learning during this course, and tell me what you are taking home with you at the end of the Microbiology-related topic entitled, *Fighting Infectious Diseases*.

Figure 9. At the end of this academic preparation course, by using this self-reflection sheet, all adult ESL students will be asked to reflect on their learning from the pertinent unit, *Microbiology*, and the topic entitled, *Fighting Infectious Diseases*.

Figure 10.1. Peer Performance Assessment Sheet

1

~PEER PERFORMANCE ASSESSMENT~

Dear students: Please fill out this assessment sheet at the end of our round-table discussions@

observed and evaluated *'s performance during round-table discussions.*

I found X's participation and effort during round-table discussions quite				
Weak []	Fair []	Good []	Very good []	Exceptional []

X listened to her/his peers carefully and with no interruption or assertion				
Weak []	Fair []	Good []	Very good []	Exceptional []

X was cooperative, open to diverse opinions, without dominating conversations				
Weak []	Fair []	Good []	Very good []	Exceptional []

X was well-prepared during the discussions we got engaged in, and she/he offered innovative, creative, and ingenious ideas to other speakers				
Weak []	Fair []	Good []	Very good []	Exceptional []

2

X got involved in discussions in a collaborative manner, rather than solitary				
Weak []	Fair []	Good []	Very good []	Exceptional []

X demonstrated work that was engaging, which then stimulated the rest of the speakers throughout the round-table discussions				
Weak []	Fair []	Good []	Very good []	Exceptional []

Additional Comments [you are expected to put "sincere" comments in this section]:

Figure 10.1. ESL students will be asked to evaluate their peers' performances based on their observations during round-table discussions on the following topic, *How to Avert the Spread of Infectious Diseases*.

Figure 10.2. Peer Performance Assessment Sheet

1

~PEER PERFORMANCE ASSESSMENT~

Dear students: Please fill out this assessment sheet at the end of our team work. Thank you!

I found my team member X's participation and effort in the collaborative work quite

Weak [] Fair [] Good [] Very good [] Exceptional []

My team member, X, participated in every session we held regularly and punctually.

Weak [] Fair [] Good [] Very good [] Exceptional []

My team member, X, listened to her/his peers carefully and with no interruption

Weak [] Fair [] Good [] Very good [] Exceptional []

My team member was cooperative, open to diverse opinions, without dominating conversations

Weak [] Fair [] Good [] Very good [] Exceptional []

My team member, X, was well-prepared during each discussion we held in our group, and she/he offered innovative, creative, and ingenious ideas to the entire team

Weak [] Fair [] Good [] Very good [] Exceptional []

2

My team member, X, executed the class project in a collaborative manner, rather than solitary

Weak [] Fair [] Good [] Very good [] Exceptional []

My team member, X, demonstrated work that stimulated the rest of the team members, by dragging the entire team and inspiring all

Weak [] Fair [] Good [] Very good [] Exceptional []

My team member, X, did not avoid hard work and/or hard project deadlines

Weak [] Fair [] Good [] Very good [] Exceptional []

My team member, X, was available whenever we needed his assistance, guidance, or leadership

Weak [] Fair [] Good [] Very good [] Exceptional []

Additional Comments [you are expected to put sincere comments in this section]:

Figure 10.2. ESL students will finally evaluate their peers' performances based on their observations before, during and after a team-based activity pertinent to the same topic above.

Finally, the ESL instructor will also hand out to her students an instructor/course evaluation sheet with which they can evaluate her instructional skills. As she receives feedback from these evaluations, she will be able to take corrective actions and hone her instructional methods, or capitalize on her best practices.

By using the modular, online component (AC4) of the textbook, she will work with innovative modules in order to improve each skill. As their instructor and the moderator of the AC4 online lab, she will facilitate the learning environment for her adult ESL students in conducive to their autonomous, mastery learning in each skill. She can additionally promote a learning and teaching environment congruent with higher-order complex cognitive skills (van Merriënboer, 1997) as in the following:

- A. Vocabulary + CMI + via associations: cognitive learning;
- B. Listening + CMI + note-taking techniques + group work on listening comprehension questions + pair/group discussions: cognitive learning;
- C. Reading + CMI + text analyses (individual and group work) + group discussions on texts: cognitive learning;
- D. Speaking in real-life settings + CMI + collaborative tasks + pair/group discussions : experiential learning;
- E. Writing + CMI + analytical writing + argumentation + critique: experiential learning.

In terms of the nature of this instructional design, fostering all adult ESL learners' complex cognitive skills will be important as they excel at transferring their knowledge of unit content under the principles of first instruction (Reiser & Dempsey, 2007). Epistemologically, it is also a breeding ground for socially constructed knowledge in class based on the constructivist learning approach (Reiser & Dempsey, 2007).

ONGOING ASSESSMENTS (OAs): TIERED ACTIVITIES VIA AC4 ONLINE COURSE

There are certain criteria that will help both the instructor and her students understand to appreciate what they understand from the core of the generative topic and the objectives under the UGs. Pre-vocabulary activities will include a quick vocabulary quiz and then a lecture, respectively. In the vocabulary quiz, the students will make educated guess about the meanings of the war-related vocabulary within the context, which will not only provide them with an understanding of how to appropriately place certain academic words—by use of the correct grammatical structure—but appreciate the war-related metaphor: that is, the similarities between the fighting a diseases and fighting a war. The students will fill in the blanks with the most appropriate war-related vocabulary. The answer key will not be handed out to them beforehand. Below is an example of an ongoing assessment in this academic preparation course (see Figure 11).

Figure 11. An Example of an Ongoing Assessment with Tiered Activities

~An Example of an Ongoing Assessment~

A Tiered Activity in an Academic Preparation Course

Unit 7: Microbiology

Topic: *Fighting Infectious Diseases*

Generative Topic: War-related Academic Vocabulary

Target Audience: Adult ESL Students (Adult Education)

Level: High-Intermediate to Low Advanced

Activity: A Tiered Assignment based on a Metaphor: *War*

The instructor of this academic preparation course tiered and differentiated the unit activities, based on her students' learning styles, interests, and readiness levels. Addressing these criteria will help her figure out how effectively and efficiently her students will grasp the generative topic, *How to Fight Infectious Diseases*, by using a metaphor: *War*.

Ongoing Assessments (OAs):

There are certain criteria that can help both the instructor and her students to appreciate what they understand from the core of the generative topic and the objectives under the UGs.

The pre-vocabulary activities will include a lecture following a quick vocabulary quiz. In the vocabulary quiz, students will guess the meanings of the war-related vocabulary within the context, which will not only provide them with an understanding of how to place the academic words, by use of the correct grammatical structure, but to appreciate the war-related metaphor: that is, the similarities between the fighting a diseases and fighting a war.

The students will fill in the blanks with the most appropriate war-related vocabulary, without use of an answer key provided beforehand. Below is the snapshot of the answer key of this pre-vocabulary activity, which was retrieved from Pearson Longman Academic Connections 4 (AC4) Online Lab:

Figure 11. With this formative, ongoing assessment, the ESL teacher will hold an integrated skills approach. By use of the tiered activities she prepared in this assessment, she will be able to figure out the extent to which her students will acquire an understanding of the generative topic, *Fighting Infectious Diseases*, and gradually build upon their newly gained knowledge.

ACTIVITY 1: GAP-FILLING

Fill in the blanks below (see Figure 12), by guessing the war-related vocabulary from within the context, before we get to read the passage and listen to the lecture. For this activity, I am asking you to work with a partner of your choice. I suggest you use your previous experiences about infectious diseases and how you fought them in the past. You should consult your partner to figure out the most appropriate battle-related words in each question (see the demonstration on Prezi via http://prezi.com/fgcxhtzndn/?utm_campaign=share&utm_medium=copy&rc=ex0share).

Figure 12. Activity 1: Gap-Filling



Activity 1-Gap-Filling:

Fill in the blanks below, by guessing the war-related vocabulary from within the context, before we get to read the passage and listen to the lecture. For this activity, I am asking you to work with a partner of your choice. I suggest you use your previous experiences about infectious diseases and how you fought them in the past. You should consult your partner to figure out the most appropriate battle-related words in each question.

PLAYBOOK/KNOW

myacademicconnections**lab**4

7.2.3 Key Words: Practice

View Summary

Return to Course

Legend

Your Score: 100%

Choose the correct phrase to complete each sentence.

1) The human immune system is an extraordinary biological system. It is our ✓ **first line of defense** against infectious disease. (1 point)

Score: 1 out of 1

2) Humans develop defenses in order to ✓ **fight against** organisms that cause disease. (1 point)

Score: 1 out of 1

3) Bacteria evolve in ways that allow them to ✓ **combat** human defenses against them, which helps people to get sick. (1 point)

Score: 1 out of 1

4) When we are healthy, we are able to ✓ **resist** disease successfully. (1 point)

Score: 1 out of 1

PEARSON LONDON
myacademicconnections^{lab} 4

7.2.3 Key Words: Practice
View Summary
Return to Course
Legend

Your Score: 100%

5) People who are not vaccinated against a disease are the most ✓ **vulnerable to** that disease. (1point)

Score: 1 out of 1

6) There was a malaria ✓ **outbreak** in the village, and many people died. (1point)

Score: 1 out of 1

7) Health care professionals ✓ **battled against** the spread of measles, and have finally succeeded in getting rid of the disease. (1point)

Score: 1 out of 1

8) Diseases like polio used to be ✓ **out of control**, and they killed or disabled millions of people. (1point)

Score: 1 out of 1

PEARSON LONDON
myacademicconnections^{lab} 4

7.2.3 Key Words: Practice
View Summary
Return to Course
Legend

Your Score: 100%

9) Usually, disease-causing bacteria ✓ **is killed by** antibiotics. (1point)

Score: 1 out of 1

10) In countries where water supplies are polluted and there is a lot of poverty, people ✓ **are more susceptible to** diseases. (1point)

Score: 1 out of 1

11) The government announced that the new division of the health department would ✓ **wage a war against** the increase in childhood obesity levels. (1point)

Score: 1 out of 1

12) The hospital was able to ✓ **keep the disease under control** because they had extra doctors, nurses, and medication available. (1point)

Score: 1 out of 1

13) A disease that **✓ attacks** the immune system is very dangerous because the body isn't able to fight against new diseases, and people get much sicker. (1point)

Score: 1 out of 1

14) People in the small village were **✓ overcome by** a rare disease that couldn't be helped by medicine. (1point)

Score: 1 out of 1

Figure 12. With his gap-filling vocabulary activity from AC4 online lab, adult ESL students are asked to pair up and guess various war-related vocabulary words regarding the context (i.e., humans' fight with infectious diseases). The students are then to fill in the blanks with these words. This is a useful warm-up activity for students prior to their passing onto subsequent activities in other skills such as reading and listening. The scaffolding component in this activity can especially lead to an understanding that the course instructor applies a constructivist learning approach.

ACTIVITY 2: INVESTIGATIVE QUESTION

Look at the picture below. What do you see in this picture?

Figure 13. Picture of a Baby Vaccinated in the Fight with Infectious Diseases

Activity 2:

Investigative Question: Look at the picture below. What do you see in this picture?



Activity 2-Answer the Investigative Question:

Discuss with your partner and then share with the class what speaks to you in this picture. Link your discussion to today's topic, "Fighting Infectious Diseases," before you get to listen to the lecture. Also, please use the academic vocabulary (war-related vocabulary) that you had learned in the previous vocabulary activity (Activity 1).

Figure 13. This visual is used in class as a warm-up activity for discussion among ESL students.
Source: <https://prezi.com/fgcxhttyndn/copy-of-copy-of-technology-making-learning-meaningful/>

ACTIVITY 3: LISTENING

Now, go to your online course (AC4), and login with your user ID and password in order to listen to the lecture, *Conditions that Affect the Spread of Infectious Diseases* (see Figure 14). What did you understand while listening to the professor's lecture? You could read the transcript of this lecture on Prezi from http://prezi.com/fgcxhttyndn/?utm_campaign=share&utm_medium=copy&rc=ex0share.

ANSWER THE INVESTIGATIVE QUESTION

Based on your comprehension of the lecture, discuss with your partner how we can avert the spread of resistant bacteria or the spread of infectious diseases. Should you have any confusion while listening to the lecture, check the back of your textbook to also read the audioscript of this lecture.

Figure 14. Unit 7 (Microbiology) Lecture Transcript

Lecture: Conditions that Affect the Spread of Infectious Diseases

Professor: Hello everyone. This is our first lecture on infectious diseases.

Do you remember the outbreak of Severe Acute Respiratory Syndrome (or SARS) in 2003, or the more recent spread of the swine flu? Now, these are cases of infectious diseases that spread on a global scale. How can we keep these infectious diseases under control when they begin to spread? And this is the focus of today's lecture: the conditions that encourage or discourage the spread of infectious diseases. So, first of all, if we're in good health, we are more able to resist disease, and the opposite is also true—if we're nutritionally deficient, or ill with another disease (like cancer) we're more likely to be susceptible.

A clean water supply and efficient water treatment are essential to preventing all kinds of illnesses. Our water systems can contain parasites that lead to schistosomiasis. Schistosomiasis, which is a disease that damages the bladder, the kidney, the liver, and the intestines. The World Health Organization estimates that 200 million people may be infected with the parasite and that 200,000 die every year.

Now, food preparation also affects our health. Gastroenteritis, gastro-en-ter-i-tis, which is a disease of the stomach and the intestines, is caused by improperly prepared foods, reheated meat and seafood dishes, dairy and bakery products. The WHO states that gastroenteritis kills 5 to 8 million people per year, and is the leading cause of death for children under the age of five. This, when gastroenteritis can be treated simply by rehydration.

Also, most of us live in large groups, in very large groups, and this makes us more vulnerable to infectious disease. So, let's look at an example to make this more obvious. When a child is exposed to measles, his or her body requires about two weeks to make antibodies to fight the disease. This means that for the measles virus to survive, it must find a new body every two weeks. And this is easily done in a city where children go to school and meet at play groups.

And here's another impact of living together in groups: we have more contact with waste products. We have to manage our waste so that we have as little contact with it as possible because there are many bacterial diseases and parasitic worms that result from contact with human waste. And of course, we have to minimize our contact with animal waste to prevent the spread of disease.

As if this weren't enough, large groups of people attract what we call "agents of disease"—mosquitoes and rats. The kinds of things we do to support large numbers of humans contribute to the spread of disease. Now, to be specific, when we cut down trees for agricultural purposes or for urban development, we create pools of stagnant water, which are breeding grounds for mosquitoes that carry the protozoa that cause malaria. Similarly, large populations of humans tend to attract rats and other rodents that may also be agents of disease.

Our current levels of travel enhance the ability of a disease to spread as well. Like when SARS and the swine flu began to spread, one of the main problems was that unknowingly infected people traveling from one country to another, spread the disease across borders. These people unknowingly spread the disease to populations that had never been exposed to these diseases before. And if you have never been exposed to a disease before, then you have no antibodies, and you're much more susceptible to contracting the disease.

This is nothing new, of course. One of the most horrific examples of this was the Black Death in Europe (in around 1348 to 1350). The Black Death was bubonic plague, caused by bacteria transmitted by the rat flea, which can spread to humans. An outbreak of bubonic plague was recorded in China in the 1330s, and by the late 1340s it had reached Europe. By the end of the epidemic, a third of Europeans, that's 25 to 40 million, had been killed, and we don't know how many Chinese had died. These deaths changed the economic and cultural life of Asia and Europe forever. Similarly, the native peoples of "The New World" also suffered when the European explorers and colonists arrived after 1492. Measles, smallpox, influenza, and whooping cough killed many of the natives throughout North and South America, the Pacific Islands, and Australia. Some populations were completely wiped out, and others had such severe disease rates that their cultures were destroyed.

So all of these conditions influence the spread of infectious diseases:

- how healthy we are
- whether we have access to clean water
- how we prepare our food
- how closely we live with others
- how much contact we have with waste products
- how closely we live to "agents of disease" like mosquitoes and rats
- how much we travel
- how likely we are to be exposed to a "new" disease

These are all conditions that we can take into account in our constant battle against the spread of contagious diseases. Now, the next challenge humans face in the war against infectious diseases is antibiotic resistance. We need to figure out what to do to combat antibiotic resistance. So, antibiotic resistance will be the focus of your reading for next class.

Figure 14. Getting her students to read the transcript of unit 7 lecture as her students listen to it simultaneously, the ESL instructor will decipher where they are. Accordingly, she will pair them up or group them appropriately with their peers, so they can collaboratively discuss the related topic in depth.

It is noteworthy that all of the activities tiered with these ongoing assessments align with the understanding goals (UGs) of this unit topic. Based on the ESL students' learning profiles, interests, and needs, the instructor of this academic preparation course will decipher which student might have inclination toward more assistance as far as his/her deeper understanding of the UGs. The activities were tiered in a way that the students can first figure out the fundamentals of academic vocabulary in their fight with diseases that are infectious. Drawing from this activity, the instructor will then be able pair up or group each student with their peers in a natural process. Grouping with this tiered activity will occur without her guidance—be the sitting arrangement, grouping styles, learners' profiles, etc. From this activity, three learning gains are expected:

1. Grouping will form in its natural progress, and the ESL students will derive context-related meanings of academic words, developing an appreciation of what metaphorical use of the language is;
2. The students will appreciate the application of war/battle-related vocabulary in real-life settings;
3. They will develop an understanding of certain grammatical structures used to facilitate their academic vocabulary use (i.e., vocabulary quiz).

CONCLUSION

In light of everything addressed with respect to this unit design created with CCDT, it is critical to emphasize that all of the technologies that can assist with ESL students' meaning making during their learning process were included in the design in a way that development of each academic skill was supported with a particular technology and specific content delivered resulted in as highly authentic and engaging. Besides CCDT as a curriculum design tool, there was yet an additional technology, Prezi, with the support of which almost all of the components of the design were demonstrated. Prezi gives an overview of what components went into CCDT. It

is an interactive, animated technology where the guiding principles of ADDIE and constructivist learning theory on which this unit curriculum design was grounded can be observed. Therefore, all of these educational technologies and the purpose of this unit design considered, the educational objective with this curriculum design was to facilitate design, development, delivery, and evaluation of effective instruction, teaching and learning for understanding, and enable students' meaningful, comprehensive learning via which they can direct and master their own learning processes. The design was consistent with the guiding principles of the aforementioned theoretical learning frameworks and the core components of the popular ADDIE model. Under this context, both the theoretical basis for and practical aspect of CCDT can have positive implications both on the part of the adult ESL students and the instructor of this academic preparation course. First, the theory and practice of this design created with CCDT greatly helped concert much effort to justify the effectiveness, efficiency, and authenticity of the subject matter delivered through this design. Second, both the art and science of the design are also expected to lead to what the designer of this unit lesson hoped to achieve for all of her students: a comprehensive understanding of and appreciation for the positive impact of CMI-driven learning/teaching in a theme-based adult ESL course. What emerged from this design was a second language learning and teaching environment wherein all of the activities exercised both inside and outside of the classroom can pave the way for "a persisting change in human performance" (Driscoll, 2005, p. 9); in other words, a considerable improvement in not only the instructor's pedagogical, instructional, and CALL-based practices, but most importantly, in ESL students' academic performances in all domains in English.

REFERENCES

- Bloom, B. S. (1968). Learning for mastery. *Evaluation Comment*, 1(2), 1–5.
- Dede, C. (May 2011). Reconceptualizing technology integration to meet the necessity of transformation. *Journal of Curriculum and Instruction (JoCI)*, 5(1), 4–16.
- Driscoll, M. P. (2005). *Psychology of learning for instruction* (3rd ed.). Needham Heights, MA: Allyn & Bacon.
- Gagne, R. M., Wager, W. W., Golas, K. C., & Keller, J. M. (2005). *Principles of instructional design* (5th ed.). Mason, OH: Cengage Learning.
- Gustafson, K. L., & Branch, R. (1997). Revisioning models of instructional development. *Educational Technology Research and Development*, 45(3), 73–89.
- Khadimally, M.S. (2014, December). *Technology and Making Learning Meaningful*. Interactive, online presentation prepared for doctoral work in the EDT/721 Instructional Design Course at the School of Advanced Studies, University of Phoenix, AZ. Retrieved from http://prezi.com/fgcxhttzyndn/?utm_campaign=share&utm_medium=copy&rc=ex0share
- Knowles, M. S. (1970). *The modern practice of adult education: andragogy versus pedagogy*. New York: The Association Press.
- Ormrod, J. (2008). *Human learning* (5th ed.). Upper Saddle River, NJ: Pearson/Merrill Prentice Hall.
- Reiser, R. A., & Dempsey, J. V. (2007). *Trends and issues in instructional design and technology* (4th ed.). Columbus, OH: Pearson.
- van Merriënboer, Jeroen J. G. (1997). *Training complex cognitive skills: A four-component instructional design model for technical training*. Englewood Cliffs, NJ: Educational Technology Publications.
- Vygotsky, L. S. (1978). *Mind and society: the development of higher mental processes*. Cambridge, MA: Harvard University Press.

Developing a Teaching Model Using aAn Online Collaboration Approach for a Digital Technique Practical Work

Muchlas

*Ahmad Dahlan University, Yogyakarta , Indonesia
muchlas.te@uad.ac.id*

ABSTRACT

This research is aimed to produce a teaching model and its supporting instruments using a collaboration approach for a digital technique practical work attended by higher education students. The model is found to be flexible and relatively low cost. Through this research, feasibility and learning impact of the model will be determined. The model has been tested by some experts of learning multimedia, digital engineering, e-learning and instructional design, and analyzed using a Delphi technique. The model was also tested by 10 instructors and 25 students of the Electrical Engineering Department. The perception of the subjects was then analyzed using a percentage method. The determination of learning impact was done using a different average score. From the results obtained, the developed model: (1) could be implemented with more flexible and low cost to support the practical work in higher education; (2) has a positive impact on the learning, i.e. it can improve significant students' learning achievement; and (3) shows good perception from the subjects.

Keywords: developing, teaching model, online collaboration

INTRODUCTION

In academic activities, practical work (practicum) that is usually run using hands-on labs has a weakness such of costly, inflexible and lack of student motivation. Further work, Ma & Nickerson (2006) reported that the characteristics of a hands-on labs introduces some disadvantages such of: (1) materials procurement and operation are expensive; (2) require more time for instructors; (3) makes students feel less comfortable during their work; (4) can not provide a special needs for students; and (5) can not serve the needs of the distance learning.

Elawady & Tolba (2009) reported that use of virtual laboratory in the practical work can offer an alternative technique of a practical work with more flexible, appropriate for purpose conceptual understanding, low cost, and has a better pedagogic aspects compare than other laboratory types. Macias & Mendez (2007) illustrate that the costs needed in that technique is much cheaper than the cost of a traditional laboratory. In addition, the use of virtual labs also provides benefits of increasing number of lab sessions and number of teams/groups of students per week.

Practical work run using a virtual lab can increase the financing efficiency because the system is based on a simulator that uses the available computer program. Previous studies showed that using simulators: (1) can increase students' understanding of learning material in practical work activity (Colace, et al., 2004), (2) can be as effective as using a real laboratory (Kantzavelou, 2005; Tzafestas, et al., 2006; Corter, et. al, 2007; Lang, et al., 2007; Wolf, 2010; Goodwin, et al., 2011), (3) can be more efficient than using a real laboratory (Candelas, et. al, 2006; Saleh, et al., 2009), and (4) provides convenient and high flexibility in practical work (Mateev, et al. 2007; Bailey & Freeman, 2010). By referring to the above advantages, we can say that the use of simulators to substitute a hands-on lab can enhance a students' learning achievement.

Shokri & Faraahi (2010) refer to the work of Malki & Matarrita (2002), and also Palagin, et al. (2007) reported that by using the simulator they have obtained some advantages of (1) relatively low cost of product, (2) more secure during the experiment from any hazardous substances, (3) practical work activities are more flexible because students can change the work environment, procedures or types of experiment quickly with low cost, (4) broad accessibility, because it can be accessed from anywhere and anytime, and (5) enable to create collaborative work.

Alessi & Trollip (2001) reported that by comparing with the real activities, simulation model provides some advantages such as: (1) increasing safety when interacting with objects or physical phenomena being studied; (2) providing an experience that is difficult to be experienced in the real world; (3) easy in setting the time of activity; (4) making the rare events become regular events; (5) enabling a complex learning situation can be controlled; and (6) allowing to save cost. Meanwhile, by comparing between media and other methods such as books, regular lectures, or tutorial, the use of simulation provides some advantages such of: (1) build the

motivation; (2) improve the transfer of knowledge; (3) perform more efficient; (4) perform more flexible; (5) apply to all phases of a learning process; and (6) show more adaptive for different educational philosophy.

Practical work using the virtual lab can be more flexible if this technique could be implemented using an online learning. Therefore, one solution to overcome that weakness is using an online system to run the practical work activities. The online teaching models has been developed by Candelas, et. al. (2006), Mateev, et al. (2007), Saleh, et al. (2009), Radu (2010), Shokri & Faraahi (2010), Hassan, et al. (2010), and Goodwin, et. al. (2011). Their works were done using online learning system, but has not facilitated using a collaboration method that is considered able to improve the results. The online collaboration is an approach that will determine the success of practical work because this approach can motivate the individuals in group work, and as a medium of learning among individuals (Kask, 2009).

In this research, the model and its supporting instruments will be produced, and derived from Anderson (2008), for an online teaching for practical work. The developed model will provide an online collaborative environment to support practical work in digital technique. This study is also aimed to determine the feasibility and learning impact of the model. The results of this research can be used as an alternative learning model in higher education that introduces more flexible and low cost of practical work.

RESEARCH METHOD

Experiment was done using a method consists of some sections below.

(i) Research Type and Procedure

This research was conducted through several steps of preliminary study, planning, preliminary model development, preliminary test, main model revision, field test, final model revision and model dissemination, from Borg & Gall (1983). Furthermore, the model was validated and revised by some experts. The model was tested by subjects in online practicum activities for 8 sessions. Based on the results of testing, the model is then conducted into the final revision. The final stage of the model development is dissemination to potential users.

(ii) Research Subjects

The subjects were divided into two categories i.e. the subjects for preliminary testing and field testing. In preliminary testing, the model was tested by four experts of learning multimedia, digital engineering, e-learning and instructional design, respectively which were selected purposively. Meanwhile, the subjects of the field testing were 10 instructors and 25 students of the Department of Electrical Engineering, which were participants of the digital technique lecture/lesson.

(iii) Data, Instruments, and Data Collection Techniques

In this research, type of data is classified into three categories i.e. data for the purposes of analyses of: (1) the experts judgement; (2) the learning impact; and (3) perception of the subjects to the developed model in the instructional and presentation aspects. The instruments to measure data related to the expert judgement is a questionnaire form. In this study, aspects of the experts validation includes: (1) identification of the problems; (2) determination of priority in type and model manufacture; (3) determination of the program goals; (4) structure and components of the model; and (5) instruments of the model. To obtain data for validation of the lessons plan (one of the supporting instruments of the model), it was used a questionnaire containing aspects of: (1) identity of the subjects matter; (2) basic competencies and indicators of the learning outcomes; (3) subject matter; (4) students activities in the learning process; (5) lecturer activities in the teaching; (6) assessment of learning; and (7) references. Data to validate the Digital Technique textbook were obtained through questionnaire including aspects of: (1) cover; (2) basic competencies and objectives; (3) subject matter; (4) graphics; (5) presentation; (6) language; (7) evaluation; and (8) references. Data related to the validation of the manual for an online practicum for lecturers/instructors/students as well as the manual for breadboard simulator were obtained through the questionnaires containing aspects of: (1) cover; (2) subject matters; (3) graphics; (4) presentation; and (5) language. Meanwhile, data to validate the manual for digital technique practicum were obtained through questionnaire with aspects of: (1) cover; (2) subject matters; (3) presentation; (4) language; and (5) evaluation.

Test of the learning effect was done by using the data obtained through the *pre-test* and *post-test* instruments. *Pre-test* instrument was given before a practical work and the *post-test* done. Both tests were done at each practical work session. The instrument of perception test in an instructional aspect is questionnaire containing some components of: (1) clarity of basic competences and goals; (2) clarity of the learning instructions; (3) ease of understanding the subject matter of practicum; (4) the breadth and depth of the subject matter; (5) the accuracy of the sequence of presentation; (6) interactivity; (7) flexibility; and (8) the accuracy of evaluation. Data related to the perception test in the model presentation aspect were obtained through questionnaire

containing some components of: (1) clarity of the instructions for use; (2) legibility; (3) quality of image and animation; (4) composition of color; (5) quality of communication facilities; and (6) ease of operation.

(iv) Data Analysis Techniques

To find out the validity of the developed model, a Delphi technique was used based on the consensus accepted by the experts. The consensus included the aspects of: (1) identification of the problem through a needs analysis; (2) determination of priority (type and model manufacture); (3) determination of program objectives; and (4) determination of the problem solution. Percentage of each aspect of the validation was predetermined before analysis. To determine the feasibility of the model, some criteria were used as shown in Table 1. To determine the effect of model developed, different test of average score between *pre-test* and *post-test* was used. Subject perception was determined through descriptive analysis using percentage of criteria as tabulated in Table 1.

Table 1. Criteria of the feasibility model and perception

Range	Level
80% - 100%	Very Good
66% - 79%	Good
56% - 65%	Poor
0% - 55%	Very Poor

FINDINGS AND DISCUSSION

From the research, model validity justified by the expert are shown in Figure 1. Based on that figure, the consensus given by the experts on the aspect of problem identification is 86.5% or categorized as ‘very good’ level. This means that the model developed based on a needs analysis is accurate respect to: (1) demands on needs of education; (2) demands on the development of science, technology and dynamics of the work places; (3) needs of potential users of the model; (4) demands on the effectiveness and efficiency improvement in an educational process; (5) a comprehensive needs analysis; and (6) type of model which can applied to the real world. Based on the analysis and validity criteria, it can be argued that from the problem identification aspects, the developed model considered by the experts is very feasible for further implementation.

From the aspects of determination to model type, the experts consensus toward validity of the model gives a percentage of 89.6%. The experts have agreed that: (1) determination of the developed model type is a priority for problems solution; (2) the developed model type can contribute to satisfy the needs of education; (3) the development of the model is an appropriate solution to solve the problem; (4) the developed model can improve the efficiency and effectiveness of education; (5) the model development is feasible by the researcher; and (6) the developed model type can be applied into the real world.

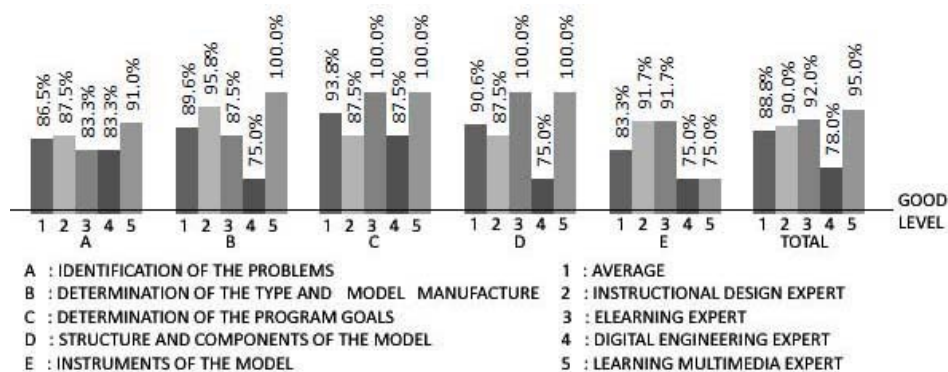


Figure 1. Histogram of experts' consensus for the model.

The results show that three experts mark a level of consensus over 80% except the digital engineering expert that gives a feasibility level for 75% or worthy category. This is due to the consideration of digital engineering expert that determination of developed model should be based on the character of the subjects matter that will be practiced. Not all courses can be conducted in practical work through virtual online models, but the proposed model could cover wider scope of courses. However, from the aspect of determination of model type, with the consensus level of 89.6 %, the model is very feasible for implementation.

For determination of the program goals aspects as shown in Figure 1, the experts agree that the goals of the model development correlates to the problem solution that is a priority problem to be solved and the formulation has directed to the increase of educational effectiveness and efficiency. Consensus of average percentage of

93.8% has shown that the developed model, based on goal-setting aspects of the program is very feasible for implementation.

Furthermore, from the aspect of the structure and components of the model as shown in Figure 1, it is seen the experts have agreed that the developed model has adequate structures and components. In this case, the developed model: (1) has been described in forms of the structure that contains the components, (2) has its structure that is different from the existing models, (3) has relationships among its components that has been described clearly; (4) contains a clear and appropriate setting, (5) contains a syntax that can support achievement of competency standards, in line with the methods and learning approaches used, and can be implemented easily.

For the aspect of model determination and the structure and components, the consensus of digital engineering expert has a lowest percentage i.e. 75% (good level), meanwhile three other experts have categorized as 'very good' level of consensus. They consider that the structure and components of the model are not a new model at all, but rather the development of one component i.e. innovation in part of interaction among the students from offline into online collaboration approach, particularly in the use of simulator. The expert suggests to describe the difference between the developed model and the existing models. However, as a whole, from the aspect of the structure and its component, with an average consensus percentage of 90.6%, this developed model is very feasible for implementation.

The final aspect of the validity used by some experts to determine the feasibility of the model in this study is the instruments of model. In this case, the instruments of model cover all learning instruments supporting the implementation of the model. With an average percentage of 83.3%, from the graph (Figure 1), it can be argued that the experts agree to declare that the developed model has been equipped with adequate learning instruments which is easy to understand, implement, and can help the implementation of the model.

From Figure 1, it is shown that two experts of learning multimedia and digital engineering expert give a 'good' level of consensus and two other experts give a 'very good' level of consensus. This is because the learning multimedia expert considers that when this model was being consulted, the virtual lab as one instrument of the model that able to support the practical work. This still needs a revamping process in presentation and content aspects. Meanwhile the digital engineering expert considers that the textbook and manual of simulator as the instrument of the model should be revised in some parts to satisfy the characteristics of digital engineering field. However, in general the experts have agreed that the instrument aspect point of view, the developed model is very feasible to be implemented.

Figure 1 shows that the average consensus for all aspects respect to the model developed is 88.8 %. This result shows that the experts agree that this model of research is 'good' to be implemented. The interesting phenomenon we could see from the result is that e-learning expert and learning multimedia expert give about 100% for three of five aspects obtained.

The results of the learning impact analysis for the application of the model are shown in Table 2. Analysis of the learning impact has been done to determine the effectiveness of the model that has been validated by the experts in a learning process in the digital engineering practical work. Research subjects were given as a pre-test before attending the practical work activity with the developed model, and doing the post-test after the end of session. Pre-test and post-test were conducted in online with a monitoring through video conference facilities by the instructor.

In this test of learning impact, measurement of effectiveness is done by determining the significant difference between the average of value test of group before practical work (pre-test) and after practical work (post-test) at each session using a t-test. The criteria used are the value of the post-test and pre-test defined significantly different if the resulting t-test has error probability (p) less than 5%.

Table 2. Summary of analysis of learning impact

Session	Variable	Average	Standard Deviation	Average Diff.	t	p	Significance
I	Post-test 1	71.25	23.831	17.50	3.911	0.001	Significantly (p<0.005)
	Pre-test 1	53.75	25.844				
II	Post-test 2	60.83	13.805	11.25	3.576	0.002	Significantly (p<0.005)
	Pre-test 2	49.58	12.676				
III	Post-test 3	77.50	14.521	10.00	2.533	0.019	Significantly (p<0.005)
	Pre-test 3	67.50	19.393				

IV	Post-test 4	72.08	12.504	4.16	2.095	0.047	Significantly ($p < 0.005$)
	Pre-test 4	67.92	13.181				
V	Post-test 5	55.83	16.659	9.16	2.247	0.035	Significantly ($p < 0.005$)
	Pre-test 5	46.67	18.805				
VI	Post-test 6	47.50	13.270	9.17	3.817	0.001	Significantly ($p < 0.005$)
	Pre-test 6	38.33	10.072				
VII	Post-test 7	70.41	25.449	19.58	3.230	0.004	Significantly ($p < 0.005$)
	Pre-test 7	50.83	15.581				
VIII	Post-test 8	62.50	16.746	11.25	2.261	0.034	Significantly ($p < 0.005$)
	Pre-test 8	51.25	17.770				
Average	Post-test	64.74	9.376	11.46	8.857	0.000	Significantly ($p < 0.005$)
	Pre-test	53.28	8.158				

By referring to Table 2, it is shown that each practical work session, the calculation of the t-test value gives the p-value less than 5%. This result indicates a significant difference between the post-test and pre-test values for all sessions. The table also shows a positive sign in all the mean difference between the value of the post-test and pre-test, which means that there is an increase average value significantly at each practical work session. Results of data analysis to the overall mean value also show very significant increase by 11.46 points due to the effect of the application of the developed model in practical work activities.

From the analysis, it can be argued that the use of online learning model applied to each session of digital engineering practical work activity was proven it can gave a positive impact such of the ability to increase student achievement. To elaborate the impact of the developed model application, Figure 2 shows the learning impact occurred during the implementation of the practical work sessions.

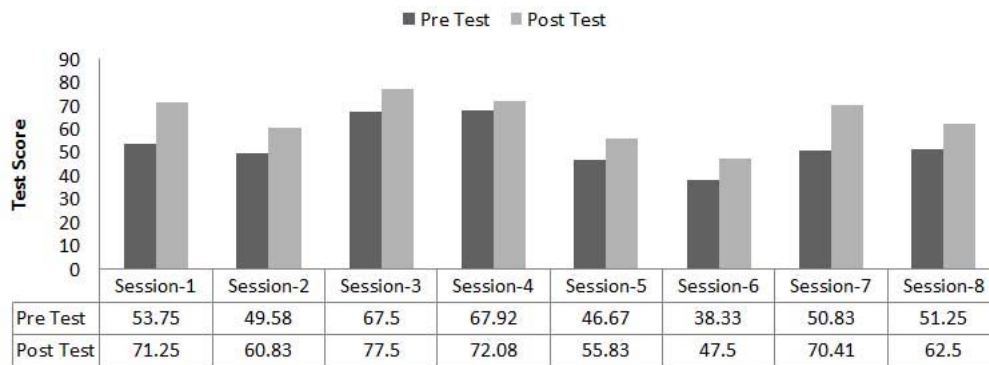


Figure 2. Graph of learning impact of the model.

From that figure, it can be seen that achievement of the student's learning is fluctuated yielded by the model introduced. This fluctuation follows the initial capability of students that could be due to the lesson's difficulty experienced by the students. The lesson was practiced differently for different sessions.

Graph shows good achievement of the students occur at session- 1, 2, 3, 4 and 7, respectively. For a moderate/sufficient category, it occurs at session- 2, 5 and 8, respectively. Session-6 is the practical work session with the worst achievement for the students. In this session, the students learnt a flip-flop lesson that is considerably most difficult lesson among the other lessons. This difficulty is common as the topic is new and as an introduction to the sequential logic lesson. Meanwhile, the other 5 sessions, the topics are logical combination that is relatively easy for the students. The worst achievement in this session is not due to the model introduced but due to the higher lesson difficulty compare than that of the other lessons. Based on the above results, the model implemented through online learning for a digital technique lesson developed in this research leads to positive impact to increasing student's achievement.

The analysis toward the subject perception is shown in Figure 3. As shown in that figure (left side) for the total score, the average percentage of instructor perception (81.8 %) is higher than for the students (73.1 %). The percentage of the instructor is categorized 'very good'. For the student, that percentage is categorized 'good'. This situation occurs because the instructor has attended the training in online practical work, more intensive compare than the students. Beside, based on the observation, the lecturer always emphasizes the instructor for his/her high responsibility of successful for the online implementation. With this, they are encouraged to have

more knowledge and skill compare than the students. This self-awareness improves higher perception of the instructional and model aspects for the instructors.

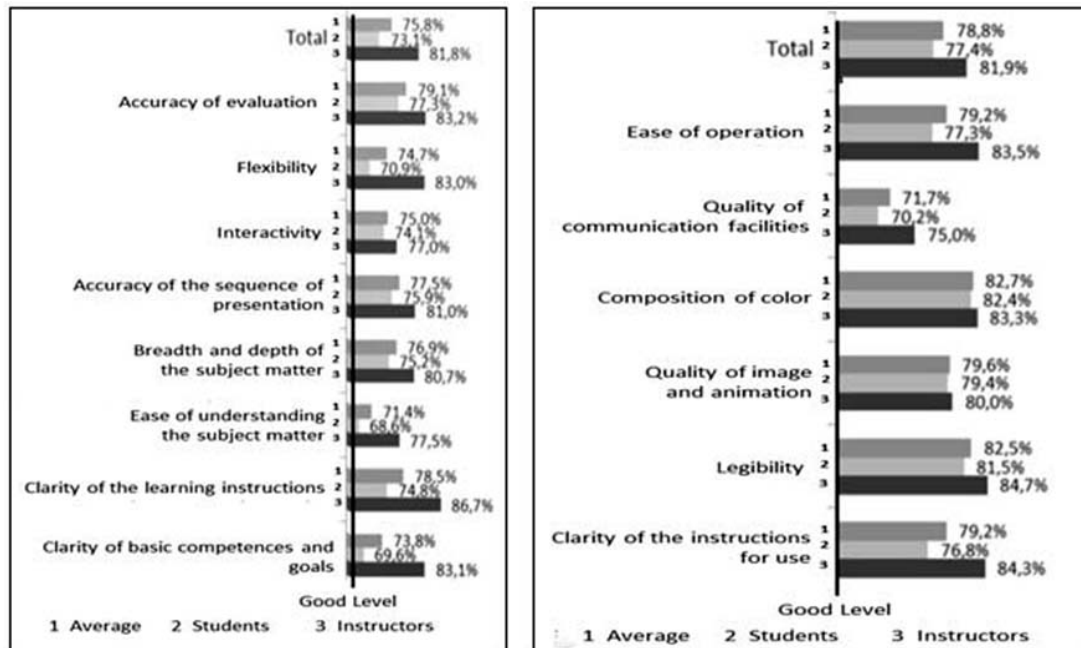


Figure 3. Histogram of subject perception in instructional aspects (left side) and presentation aspects (right side).

By referring to the results obtained, generally the subject has provided a positive perception of 75.8 % respects to the instructional aspect from the model developed through this research. However, in this research it was found that the students are still experiencing difficulties as shown by the perception level of 56 %. The difficulty arises due to the constraints related to the internet facility such of limited bandwidth leads low speed of data access needed for this online practical work.

The analysis result of the subject perception toward the model display is shown in Figure 3 (right side). From that figure, it is found that model developed has shown better performance and ease for operation with an average perception level of 78.8 %.

CONCLUSION AND RECOMMENDATION

The research done has produced an online teaching model for practical work and its supporting instruments of digital technique lesson that could introduce more flexible, and low cost in higher education institutions. The online system was supported by using an online collaboration approach. Model produced from this research is a portal of Virtual Laboratory at <http://elab.uad.ac.id>. Beside other products of a *Manual for an Online Learning Model for Practical Work*, *Lessons Plan for Digital Technique*, *Digital Technique Textbook*, *A Manual for Breadboard Simulator*, *A Manual for Online Practicum for Lecturers/Instructors/ Students*, and *A Manual for Digital Technique Practicum* with the guided inquiry method.

The model produced from this research shows a positive impact toward the student learning by increasing the significant achievement. The model also obtained positive perception from the related subject of instructional and model display aspects. Management of practical work under study program in electronic/electrical engineering is suggested to use this model as an alternative online learning as the model offers more flexible and low cost in operation.

ACKNOWLEDGMENTS

The author would like to thank Prof. Herman D. Surjono, Ph.D., the Chairman of the Department of Educational Technology, Postgraduate Program at Yogyakarta State University, for valued discussion in this work, and also both students and teaching assistants of the Department of Electrical Engineering at Ahmad Dahlan University, who volunteered to participate in this research.

REFERENCES

- Alessi, S. M. & Trollip, S. R. (2001). *Multimedia for learning: Methods and development*. Boston: Allyn and Bacon.
- Anderson, T. (2008). *The theory and practice of online learning*. Edmonton: Athabasca University Press.
- Bailey, C. & Freeman, M. J. (2010). A java bread-board simulator: Digital circuit simulation with an open-source toolset. *IADIS International Journal on Computer Science and Information System*, 55(1), 13-25.
- Borg, W. R. & Gall, M. D. (1983). *Educational research: An introduction*. New York: Longman.
- Candelas, F. A., Torres, F., Gil, P., Puente, S., & Pomares, J. (2006). Including the virtual laboratory concept in an on-line collaborative environment. *Published in advances in control education* (pp. 571-576). Laxenburg: International Federation of Automatic Control.
- Colace, F., De Santo, M., & Pietrosanto, A. (2004). Work in progress-virtual lab for electronic engineering curricula. *Published in frontiers in education 2004* (pp. T3C/22-T3C/24). Piscataway, NJ: The Institute of Electrical and Electronics Engineers, Inc.
- Corter, J. E., Nickerson, J. V., Esche, S. K., Chassapis, C., Im, S. & Ma, J. (2007). Constructing reality: A study of remote, hands-on, and simulated laboratories. *ACM Transactions on Computer-Human Interaction*, 14(2), 7-27.
- Elawady, Y. H. & Tolba, A. S. (2009). Educational objectives of different laboratory types: A comparative study. *International Journal of Computer Science and Information Security (IJSIS)*, 6(2), 89-96.
- Goodwin, G. C., Mediolli, A. M., Sher, W., Vlacic, L. B., & Welsh, J. S. (2011). Emulation-based virtual laboratories: a low-cost alternative to physical experiments in control engineering education. *IEEE Transaction on Education*, 54(1), 48-55.
- Hassan, R., Omari, N., Arshad, H., Sahran, S., & Yusof, N. H. (2010). DigiLab: A virtual lab for IT students. *WSEAS Transactions on Advances in Engineering Education*, 7(5), 151-160.
- Kantzavelou, I. (2005). A virtual lab model for an introductory computer science course. *Facta Universitatis (Nis), Ser.: Elec. Energ.*, 18(2), 263-274.
- Kask, K. (2009). *A study of science teacher development towards open inquiry teaching through an intervention programme*. Unpublished Ph.D. dissertation, Tartu University, Estonia.
- Lang, D., Mengelkamp, C., Jäger, R. S., Geoffroy, D., Billaud, M., & Zimmer, T. (2007). Pedagogical evaluation of remote laboratories in emerge project. *European Journal of Engineering Education*, 32(1), 57-72.
- Ma, J. & Nickerson, J. V. (2006). Hands-on, simulated, and remote laboratories: A comparative literature review. *ACM Computing Surveys*, 38(3), 1-24.
- Macias, M. E., & Mendez, I. (2007). Elab-remote electronics lab in real time. *Published in 2007 37th Annual frontiers in education conference-global engineering: knowledge without borders, opportunities without passport* (pp. 1512-1517). Piscataway, NJ: The Institute of Electrical and Electronics Engineers, Inc.
- Mateev, V., Todorova, S. & Smrikarov, A. (2007). Test system in digital logic design virtual laboratory tasks delivery. In B. Rachev, A. Smrikarov & D. Dimov (Eds.), *Proceedings of the 2007 international conference on computer systems and technologies* (pp. IV.11-1-IV.11-6). New York, NY: ACM Inc.
- Radu, T. (2010). Virtual and remote control lab experiment using matlab. *Annals of the Oradea University. Fascicle of Management and Technological Engineering*, 9(19), 78-81.
- Saleh, K. F., Mohamed, A. M., & Madkour, H. (2009). Developing virtual laboratories environments for engineering education. *International Journal of Arts and Sciences*, 3(1), 9-17.
- Shokri, A. & Faraahi, A. (2010). Designing of virtual laboratories based on extended event driving simulation method. *World Academy of Science, Engineering and Technology*, 68, 1357-1359.
- Tzafestas, C. S., Palaiologou, N. & Alifragis, M. (2006). Virtual and remote robotic laboratory: Comparative experimental evaluation. *IEEE Transactions on Education*, 49(3), 360-369.
- Wolf, T. (2010). Assessing student learning in a virtual laboratory environment. *IEEE Transactions on Education*, 53(2), 216-222.

Examination on ICT integration into Special Education Schools for Developing Countries

Fahriye Altınay Aksal*

*Computer Education and Instructional Technology Department, Faculty of Education, Near East University, Northern Cyprus
fahriye.altinay@neu.edu.tr*

Zehra Altınay Gazi

*Computer Education and Instructional Technology Department, Faculty of Education, Near East University, Northern Cyprus
zehra.altinay@neu.edu.tr*

ABSTRACT

Information, communication and technology (ICT) is a bridge in fostering learning who have special needs in education. It becomes a medium of connecting their way of lives and their socialization within education life. Integration of ICT plays a great role in special education. Most of the developing countries pay attention to ICT practices in their education reports in order to provide equality in education and make all citizens active and digital capable. In reports, education context, ICT policy, ICT in curriculum and teacher education, ICT and digital resources were highlighted. Some of the reports of developing countries did not set special education needs, learners and ICT support for their learning. Although they pay attention to learners who have special needs, there is an intensified need to make comprehensive analysis of ICT integration into special education schools. This research study aims to analyze ICT integration and facilities in special education schools in North Cyprus in order to set ICT policy in education. Documentary analysis and interviews were conducted to gain reflections and tendencies about ICT integration in special education. This research study shows adaptability of developing country to European ICT policy and furthermore the research provides comparison between context capacity with other countries in terms of a situational analysis.

Keywords: Digital age, digital divide, special needs education, policy

INTRODUCTION

Information, communication technology shaped the facilities and services of lives. The way of learning, the way of sharing experiences has been changed. ICT becomes integral of our lives and it promises opportunity for learners to gain equality in education within diverse contexts and services. In this respect, recent studies focus on the perceptions of participants on ICT, the uses of ICT and practical implications in special needs education (Brodin, Lindstrand, 2003; Peltenburg, Heuvel-Panhuizen, Robitzsch, 2010; Heemskerk, Volman, Admiraal, Dam, 2012), there is a little attention on policy of ICT within the integration of education especially special needs education. The study of Yusof, Daniel, Low, Aziz (2014) discussed teachers' perception of m-learning applications in special education. It is seen that there are limitations of using ICT in special needs education and it is suggested to use augmented reality, game-based educational software and animation projects. As ICT plays a great role to foster learning in special needs education, planning ICT in education and establishing standards through ICT policy is essential.

Liasidou (2010) puts emphasis on special needs is not personal trouble, it is public issue, therefore societies in their system need to pay attention on their policy and create a standard for the uses of ICT for upgrading the quality and equality of the special needs education. In this respect, ICT integration within education, considering the aspects of context, teacher education for ICT, ICT policy, context, digital learning resources, ICT in curriculum is crucial. While reforming the ICT in education sufficient body of knowledge; active citizenship; key competences need to be highlighted and the great role of ICT in special need education need to be discussed. Therefore this research study aims to analyze ICT integration and facilities in special education schools in North Cyprus in order to set ICT policy in education.

Diffusion of knowledge in digital age is rapidly changing. The impact of technology in learning become core area of research in literature however integration of ICT in special education stays partial. Being digital native, digital inclusion and leadership role in ICT integration in education require strategic planning and management process which ICT inclusion and provision are vital in order to cope with global standards as developing countries education system. Therefore, this research study aims to make comprehensive analysis of ICT integration into special education schools and examine ICT integration and facilities in special education schools in North Cyprus in order to set ICT policy in education.

METHODOLOGY

The research has qualitative nature which patterns and meanings have potential influence to understand the research focus. Thus research aims to examine the ICT integration into special education programmes and courses within education system, reflections and policies provided a ground to understand the further strategies and strategic plans in respect to special education and ICT policy based on European standards.

Qualitative research provides in-depth examination of the patterns and meanings in respect to research focus which emic perspective can reveal the better understanding of issue or problem for better action oriented policies (Creswell, 2009). Silverman (2000) pointed out that qualitative research is inductive process to understand the process in a detailed way with all patterns and meanings.

Research Approach

This research stands on case study approach. Case study approach provides examination of particular situation or event to propose better solutions to the problem. In this study, case study approach was employed to examine the current situation of ICT integration into special education as ICT policy for sustainable development within education system (Creswell, 2009; Yin, 1994).

Research Participants

Volunteer headmasters of the special education schools become part of the research process. Although two of the headmasters reflect their thoughts and experiences on ICT integration in special education, responses of headmasters supported documents upon ICT integration in special education field.

Research Context

The research was implemented in North Cyprus which is developing country. As a developing country, ICT integration in education system has limited facilities. Although there are attempts in ICT integration in education, there is limited facilities for special education according to records and documents. Two special education schools become part of this research study to reveal the current situation of the system upon ICT integration policy into special education.

Data Collection Techniques and Analysis

Documents and in-depth interviews were employed in this research. Documents as regards the ICT policy in education system, European standards in ICT integration studies and reports were used to do cross examination of current situation and set policy suggestions for the system. According to reports, education context, ICT policy, ICT in curriculum and teacher education, ICT and digital resources were highlighted. Furthermore, in-depth interviews were conducted with two headmaster to reveal the system practices upon education context, ICT policy, ICT in curriculum and teacher education, ICT and digital resources. For documents, documentary analysis was done and thematic analysis was done for interviews (Creswell, 2009, Denzin, Lincoln, 2003).

RESEARCH FINDINGS

The research revealed that education system in terms of ICT policy, ICT in curriculum and teacher education, ICT and digital resources have limited facilities and system needs strategic planning and management to set policy for the integration of ICT in special education.

Education Context and ICT Policy

ICT can improve the quality of teaching, learning and management in schools which literature pays attention on ICT is significant for improving learning of children. Although literature pays attention on ICT and its implications to education system, there is little attempt on using digital technologies instead of traditional applications. Documents and interview findings highlighted that ICT provision and implementation in special education is not sufficient.

ICT in Curriculum and Teacher Education

The tendency to integrate ICT in special education is even in preliminary stage in curriculum and teacher education programmes. Within the system, there are new programme and courses to capture ICT competence and literacy for special education field. The awareness of necessity on ICT integration in special education become current system issue and problem which need to be investigated and planned in detail through strategic planning and management.

ICT and Digital Resources

The most challenge of using ICT in education, significantly in special education is the digital resources. Using digital resources and educational infrastructure within the system are very limited for special education upon

documents and interview results. As regards the critical analysis on digital and interactive learning environments, applications and competences are not satisfactory. Although literature points out positive correlation between success and using digital resources in special education, there is no evidence on practice within this system.

Overall Evaluation

Documents and in-depth interview results showed that there is potential need to integrate ICT in education, significantly in special education. There is limited experts in special education who have potential competence on ICT literacy in special education. Furthermore, there is no practical implementation and policy oriented actions. In addition, there is intensified need to consider digital resources to increase the learning and performance of the children who are part of the special education upon their individual characteristics and needs.

CONCLUSION AND RECOMMENDATIONS

Information and communication technologies (ICT) are accepted as enhancing learning as regards the diffusion of knowledge in digital age. However, it is still a problem in developing countries which adaptation process takes time to integrate ICT in education system. Although literature pays attention on evidence of learning outcomes upon ICT practices in learning process, this study aims to reflect critical analysis on ICT in special education. Difficulty of traditional practices, infrastructure and specialisation in the field can be listed as obstacles in ICT integration in special education for developing countries upon documents and interviews results. The critical success factor of ICT integration in special education is the digital literacy which need to be resolved and considered within the system.

Technology management process needs to be considered within the system to set priorities and action plans for further development. In this respect, system needs to consider ICT policy for special education, put emphasis on curriculum and teacher education programme and courses, digital resources and literacy to get success in special education field. Technology management process requires strategic planning process which this process propose participatory decision making process of team experts. Technology management process and in-service trainings to the teachers and families are very crucial. Internalization of digital citizenship within the system is necessary. Therefore, reaching out success and constructive performance on integrating ICT into special education programme and courses even in management process of the schools need contextualization and ICT policy and digital literacy. This study provides a ground and opens a debate on ICT in special education and this study confirms that there are limited facilities in ICT integration. For further studies, longitudinal studies may be conducted and strategic planning, technology management process can be revealed with evidence and results.

REFERENCES

- Brodin, J., Lindstrand, P. (2003). What about ICT in special education? Special educators evaluate information and communication technology as a learning tool.
- Creswell, J. W. (2009). *Research design: Qualitative & quantitative approaches*. United Kingdom: SAGE.
- Denzin, N. K., Lincoln, Y. S. (2003). *Collecting and interpreting qualitative materials*. London: SAGE.
- Heemskerk, I., Volman, M., Admiraal, W., Dam, G. (2012). Inclusiveness of ICT in secondary education: students' appreciation of ICT tools. *International Journal of Inclusive Education*, 16(2).
- Liasidou, A. (2010). Special educational needs: a public issue. *International Studies in Sociology of Education*, 20(3).
- Peltenburg, M., Heuvel-Panhuizen, M., Robitzsch, A. (2010). ICT-based dynamic assessment to reveal special education students' potential in mathematics. *Research Papers in Education*, 25(3).
- Silverman, D. (2005). *Doing qualitative research*. London: SAGE.
- Yin, R. K. (1994). *Case study research design and methods*. London: SAGE.
- Yusof, A. M., Gnanamalar, E., Daniel, S., Low, W. Y., Aziz, K. (2014). Teachers' perception of mobile edutainment for special needs learners: the Malaysian case. *International Journal of Inclusive Education*, 18(2).

Identification of Difficulties in the Consolidation of Research Processes at a Higher Education Institution: A Case Study

Daniela, MORALES Zapata

Universidad Nacional de Colombia, Colombia
dmoralesz@unal.edu.co

Luisa, DIEZ Echavarría

Instituto Tecnológico Metropolitano, Colombia
jhoanyvalencia@itm.edu.co

Eliana, VILLA Enciso

Corporación Universitaria Minuto de Dios, Colombia
emvilla@unal.edu.co

Laura, VANEGAS Rendón

Universidad Nacional de Colombia, Colombia
lacvanegasre@unal.edu.co

Alejandro Valencia Arias

Instituto Tecnológico Metropolitano, Colombia
jhoanyvalencia@itm.edu.co

ABSTRACT

Research is one of the three institutional basic functions of the University, and as such, universities that do not consolidate their research processes do not present a good projection in the future. As a multi level organization, the University must create and strengthen guidelines that transform it into a strategic actor in competitive markets, which makes research a tool to meet the strategic objectives of funding and academic excellence. In Latin America, it is a priority to develop in university students and professors the necessary abilities to enhance research skills. In this exploratory research, a mixed approach in order to investigate the expectations and perceptions of the academic community at Corporación Universitaria Minuto de Dios-Sectional Bello (UNIMINUTO) with respect to the consolidation of research processes in the institution was applied. Findings prove that the most important situation to evaluate regarding the developed investigative processes in UNIMINUTO is the role being played by the outreach activity of the Research System within the institution, as there is a general lack of students' knowledge in this regard. Similarly, it was found that professors are familiar with research in their areas but unfamiliar, to some extent, with what happens in terms of research in other fields within the same institution.

Keywords: research processes, higher education institutions (HEIs), difficulties in investigative processes, consolidating research processes.

INTRODUCTION

Research experiences are associated with obtaining positive academic outcomes for students, and future permanence of the research process depends on the development of research within universities (Rip, 2011). Similarly, the development of research processes within universities is closely linked to the perceptions and motivations of the academic community in terms of benefits from research (Jusoh & Abidin, 2012), such as: publishing, prestige, financing, experience, social support, economic benefits and other aspects related to the time commitment, balance of personal life, and roles in research (Adedokun & Burgess, 2011). Despite this, the construction of science and research by the Higher Education Institutions (HEIs) presents difficulties due to the low contribution made in forming scientific and research skills in students (Rojas, 2010).

Based on the above, this study seeks to identify the expectations and perceptions of the university community of the School of Economics and Administrative Sciences at Corporación Universitaria Minuto de Dios - Sectional Bello. In this sense, this study will help to identify the difficulties of HEIs to formalize and strengthen its investigative processes, negatively affecting both participation and recognition of the academic community in these processes.

LITERATURE REVIEW

Importance of research in educational institutions

The future of universities depends on the level of research that each one develops; in fact, universities that do not carry out research have a poor outlook in the future. Universities, specifically from research groups, must seek to apply the concept of "re-contextualization of science in society" in order to make the research process more current, where students are encouraged participate and perceive the usefulness of being embedded in research training (Bolin, Lee, GlenMaye, & Yoon, 2012). Hence, the formation of interdisciplinary groups is recommended, since in such groups there is greater cooperation and feedback among different curriculum areas, which to some extent can generate greater attraction for students than unidisciplinary or individual forms of research(Rip, 2011).

In this sense, the university as a multilevel organization should create guidelines with the aim of transforming it into a strategic actor operating in competitive markets, which makes research a tool to meet its strategic objectives: funding and academic excellence. The global trend today is the creation of alliances and mergers between universities and public research organizations; for example, the governments of the Netherlands, Germany and France have created areas of research where they reunite different research groups from universities to create new initiatives and convenient ideas with the development of a nation (Rip, 2011). Another note worthy example in this regard is the efforts of Mexican institutions, such as the Secretaría de Educación Pública (SEP) and the Consejo Nacional de Ciencia y Tecnología (Conacyt), that have increased public and private investment in research and development (R& D) universities. It is thus recommended that, in those areas, governments invest an amount exceeding 2% of the GDP of each country (Licón & Rangel, 2012).

Specifically, to meet the new challenges that universities face, Rip (2011) proposes to change aspects of its management, evolving from partially independent research groups where the general boundaries are blurred and many difficulties are faced, to research groups with "interdependence combined" where these difficulties are overcome. This refers primarily to universities so that they can participate in bidding for contracts to manage and deliver a research program or get contracts to train students in specific areas. A challenge in Latin America universities, according to studies in Puerto Rico, is to develop students' skills (1) to navigate between different sources of information and knowledge in different media, and (2) to assess the value of information found and its potential for research (Mazurkiewicz & Potts, 2007).

Universities involved in research should change its structure and focus its research strategy. The concept of "strategic research "is defined as "basic research carried out with the expectation that it will produce abroad base of knowledge according to the solution of practical problems in the future" (Irvine & Martin, 1984, pp 11). To meet this objective, universities that have a research approach should have some access to databases and bibliographic resources, either electronic or physical, that will also attract greater participation and student interest (Mazurkiewicz & Potts, 2007).

A common method used in countries such as Holland, USA, UK, among others, has been the creation of the so-called centers of excellence and relevance, which are entities created to perform specialized research on a topic. This type of research is funded by interest groups, investigative agencies or by the governments, making those entities an excellent option to create groups and encourage, train and form students in research (Rip, 2011). The primary key in universities is to diversify and recombine cognitive processes (learning) and institutional processes (service); this means researching in different areas, having various laboratories--if possible--, and achieving adequate financing of companies and interest groups. The centers of excellence should seek personnel qualified in research (Prosser, Martin, Trigwell, Ramsden, & Middleton, 2007).

The degree of a university's support to the research process results in strengthening the potential of creativity and creating new ways of thinking and working in the community. In this sense, the research environment must have some degree of deliberate and conscious relationship with external actors; i.e. it should promote and support processes that are liked by the community while necessary with the market demands, taking into account both researchers and stakeholders (customers) (Diamond & Rush, 2012).

By the same token, Kyvik and Olsen (2012) found that the needs for change and adaptation in doctoral programs are many. It is necessary to develop inclination towards research on students, from initial courses, creating a continuing interest in the matter; so, they suggest increasing students' participation in research groups on research topics demanded by the market, and on how to find funding sources in labor markets, at a time of encouraging a scientific aptitude in them. Some authors emphasize this need in all the areas of knowledge and even consider incrementing professional knowledge at the service of humanity a professional "moral duty",

which is naturally achieved through programs that encourage and stimulate research (Carreño, 2011; Vázquez, 2014).

Expectations of students and academics on research

Although the literature is not extensive in discussing the views held by scholars about research and about the fact of being researchers, the topic has also been studied. From this perspective, the importance and value that scholars give to the matter ranges from personal interest and professional promotions to benefits of research such as publication, prestige and funding (Åkerlind, 2008).

On the other hand, a study of the preconceptions of students about the learning processes and profits that they accumulate through participation in research experiences, during their undergraduate studies, found that science was perceived as a solitary task. Besides, scientists were seen as socially isolated individuals, who do not need to enhance their communication skills in order to develop a research, and are not expected to have any social or interpersonal relationship with fellow researchers. For this reason, it is important to know, not only why individuals decide to participate in a research group and what they expect from it, but also how they make that choice, because when someone voluntarily decides to participate in an investigation, the person shall be required part of their time, previously used in other activities (Osamor&Kass,2012).

Moreover, a study at Ibadan University College in Nigeria, Osamor and Kass (2012) found that 87% of people (both students and teachers) consult with someone else (spouse, family, friends, teachers, etc.) when considering participating in the research program. Some of them required permission (especially spouses), and others participated in spite of the authorization had been denied. When asked about their reasons to participate in a research group, students said that they considered aspects such as personal growth, learning, and financial remuneration, all focused on personal gain (Osamor & Kass, 2012). Those aspects related to the motivation of the university community to participate in investigative processes are essential to address their proper insertion into research projects (Ambrose, Bridges, DiPietro, Lovett, & Norman, 2010). Thus, actions are required to involve students directly in research processes in order to increase their interest and knowledge about research (Wells, 2006).

A study realized by the Australian National University on the conceptions of research among academics at universities, in extensive research, sheds experience focused on results, impact and value of research projects. In this regard, through academic research processes, hope to contribute to the achievement of academic goals, based on their interests and personal and professional goals; seek to generate positive results within research teams in terms of providing funding to hire new investigators, or continue with the research center; intended to contribute to existing knowledge, which can generate a positive impact on the world and finally, seek to address real world issues and find solutions to these problems (Åkerlind, 2008). For students, this search for positive results in the investigation process encourages greater proactivity and commitment to the process of research training (AlGhamdi, Moussa, AlEsa, AlOthimeen, & Al-Saud, 2014).

Methodologies used to study the perceptions of students and academics on research

Among the methodological aspects used to achieve the results of the studies described above, prevailed data collection through surveys and interviews applied to undergraduate students from public and private universities (Rojas, 2010); these surveys included both closed and open questions and then for statistical data analysis packages were used, open-ended questions were coded so that it could be a quantitative analysis of these. To apply the surveys and interviews a sample group with specific characteristics (Osamor & Kass, 2012) was chosen. The questions analyzed for the study were mainly: What are the main criteria for the recruitment and placement of staff research? Is there a policy to support scholarships/course /publications/salary researchers? Is there a policy of publishing the results? Where does now and what should occupy? How do you assess the impact of research? What aspects of existing standards stimulate or hinder the development of research? (Mayorga, 2001). As motivational questions was mentioned, for example: Say why she decided to participate in the study, how did you decide to participate in the study? Did you talk to someone before deciding to participate in the study?, among others, (Osamor & Kass, 2012).

Studies involving students in interdisciplinary research programs under the supervision of academic tutors, in order to improve their aspirations regarding training and research-oriented career, for which assessments were performed learned results were also designed and the impact of the program which responded to open-ended questions covering topics such as expectations and perceptions of research experiences at the undergraduate before participating in these (Adedokun & Burgess, 2011), additional to this research work was assessed through oral presentations (Kardash, Wallace, & Blockus, 2008); to study the perspective of academic research, in-depth

interviews doctoral students and faculty research intensive universities were conducted, academics were considered both with substantial experience in research, as investigative story short (Åkerlind, 2008).

RESEARCH METHODOLOGY

For the development of this exploratory research, surveys and interviews with students/professors of the Corporación Universitaria Minuto de Dios (UNIMINUTO) were used in order to collect first hand information, which sought to have a direct approach to the sources that would allow researchers to investigate the expectations and perceptions of both populations regarding research processes taking place at UNIMINUTO. This study was conducted as self-assessment by the institution in order to know the main factors influencing the participation in research experiences of students and professors of the School of Economics and Administrative Sciences.

In order to analyze the data collected, five categories of questionnaires and interviews were formulated, generally addressing the perceptions of students and professors about the research system, their motivation and expectations to participate in research processes, and their knowledge about the promotion of the research system within the institution. Two hundred and twenty-three self-administered surveys applied to undergraduate students of the Corporación Universitaria Minuto de Dios belonging to the School of Economics and Administrative Sciences, through a not probabilistic sampling method applied, given the exploratory nature of the study. Finally, in order to compare the results, a discussion was held based on bibliographic references.

Ten seventy-six percent (10.76%) of the surveys were discarded due to inconsistencies (double answers, incomplete surveys, students from other faculties); therefore, 199 valid surveys were considered valid for the evaluation process and to gather information concerning expectations, perceptions, motivations, and knowledge about the promotion of research processes at the Corporación Universitaria Minuto de Dios. To present the obtained results through a quantitative method, the proper structure of the survey was proved. In this regard, under the criteria of the researchers, a sample of 199 students was selected and the method of Alpha by Cronbach was used in order to analyze the internal consistency of the instrument in each of its tests. An index of consistency higher than 0.60 was obtained, which proved the items of each test to be reliable.

FINDINGS AND DISCUSSIONS

Initially, a student profile is presented, displaying the surveyed population's differences according to their ages, level of advancement in their major, and interest in conducting research (Table 1). The table shows that 31% of the surveyed students correspond to a group aged between 16 and 20 years old, 32% is part of the group of students aged between 21 and 24 years old, 16% are students between 25 and 29 years old and the last group is a 21% of students who are within the ages of 30 and 43 years old. The analysis of this variable is very important--since there is no homogeneity of the population in relation to this factor--and allows identifying the different age groups that make up the different levels of advancement in the university majors. Meanwhile, a 35% (1st, 2nd and 3rd semester) of students are placed at the basic level, 37% (4th, 5th and 6th semester) at the intermediate level and 28% (7th, 8th, 9th and 10th semester) at the advanced level. The objective is to analyze the effect that a particular level of advancement in the major has over the degree of knowledge and interest of students in participating in research.

Table 1: Students' Profile

		Age				Level of Knowledge				Interest in conducting research practice		
		16- 20 years old	21-24 years old	25-29 years old	30-43 years old	High	Medium	Low	Null	Yes	No	NA
Major Level	Basic	51%	25%	10%	14%	6%	13%	32%	49%	78%	14%	7%
	Intermediate	28%	32%	19%	21%	8%	11%	44%	36%	54%	40%	6%
	Advanced	9%	42%	18%	31%	24%	22%	24%	31%	38%	53%	9%

Regarding the students' level of progress within their university majors, it is noticeable that at the basic level most students range between the ages of 16 and 20, while at the intermediate and advanced levels are students between 21 and 24 years old. The students who are in the last semesters (advanced level) of their major show greater familiarity with the offer and the research focus of the institution (22%) compared to basic and intermediate level students (6% and 8%). This may be because advanced level students have greater experience inside the institution, which has allowed them to get familiar to the communication channels used by the university to offer their research processes. Forty-four percent (44%) of the students at the intermediate level

reveal that their knowledge of the research system is low, while forty-nine (49%) of those undergoing basic levels show a null degree of knowledge, pretty representative, which suggests that they have not noticed the offer supplied by the institution in terms of research. This finding reflects the importance of evaluating the dissemination and promotion system of research within the institution.

Seventy-eight (78%) of the basic level students and (54%) of the intermediate level show a greater interest in carrying out a research practice; an option that can be seen as an opportunity for them to put into practice their academic knowledge and focus more on this type of achievements. On the other hand, (53%) of the advanced level students have a greater disinterest in this type of practice and less knowledge of it, which might explained by the fact that they are more focused on developing professional experience. It is important to keep in mind that the advanced level category is composed by thirty-one percent (31%) of students between 30 and 43 years old; it's possible to conclude that they are people who have already started their working lives and are developing academic studies to enhance their career prospects. Therefore, although the academic practice is taken into account by thirty-eight percent (38%) of the students in their last semester, it is not representative in regards to the other levels.

Having described the characteristics of the surveyed population, their perception about participation in research processes was evaluated taking into account that a successful development of this type of experience can be highly influenced by the image that students perceive of it: in some cases students' appreciation can function as a driving factor and in other situations as a variable that prevents them from getting involved in research (Adedokun & Burgess, 2011). With this goal in mind, the students were asked about the investigative skills that students have been developing throughout the training process in order to find out if there has been a significant relationship between the development of those skills and the degree of knowledge and students' interest in participating in such processes. This question followed Adedokun & Burgess (2011)'s claim that students do not consider themselves sufficiently prepared to assume the challenge of starting a research process, so it is important to identify in which level of their major they manifest to become more proficient in these kind of skills (Table 2).

Table 2: Investigative skills according to the student profile

	Level of advancement			Level of Knowledge				Interest in conducting research practice		
	Basic	Intermediate	Advanced	High	Medium	Low	Null	Yes	No	NA
Database search	33%	38%	30%	19%	20%	31%	30%	54%	43%	4%
Methodological Designs Development	28%	38%	34%	20%	16%	30%	34%	58%	34%	8%
Development of Scientific Method	28%	36%	36%	11%	25%	25%	39%	67%	33%	0%
Standards Management (APA)	47%	30%	24%	14%	17%	35%	34%	65%	30%	6%
Qualitative observation techniques	30%	41%	30%	19%	16%	23%	42%	69%	25%	6%
Data analysis	34%	37%	29%	14%	13%	38%	34%	60%	34%	7%

In relation to the students' development of research skills, Table 2 shows that those who believe that are more skilled for Standards Management/APA constitute forty-seven (47%) of the basic level students, while more advanced students did not recognize this research activity significantly (30% intermediate level and 42% advanced level). Of the students who said they have strengthened Qualitative Observation Techniques, forty-one percent (41%) belong to the intermediate level. The majority of students who consider themselves more skilled in the Development of Scientific Method belong to intermediate and advanced levels (both at 36%). Regarding Databases Search, figures show that students in the three levels have been equally trained to strengthen this skill and to improve the quality of their work (33%, 38%, and 30%). Out of those who reported having strengthened those competences throughout the course of their majors, Basic level students scored 151 times among the different options, the Intermediate level students 158 times, and the Advanced level ones scored only 128 times, which evidences a greater knowledge and development of such competences by students who are between their 1st and 6th semester.

Considering the variable “level of knowledge”, it’s possible to consider that most of the students that claimed to have strengthened investigative skills such as the Development of Scientific Method (39%) were classified into a null degree of knowledge. A similar situation occurs with the population that stated that they had developed Qualitative Observation Techniques throughout the course of their majors: forty-two percent (42%) was classified with a null degree of knowledge. Meanwhile for those who stated to be more skilled with Data Analysis, thirty-percent (38%) present a basic degree of knowledge. Lastly, out of those who consider that they have strengthened the Development of Scientific Method, twenty-five percent (25%) were classified with medium degree of knowledge.

Based on the findings described above, it’s suppose that the fact of developing scientific tools for possible participation in a research does not affect the degree of knowledge that students have about the research system of an institution. This evidence is supported by the analysis of the profile of the students surveyed, in which it is noticeable that those students in basic and intermediate levels have a degree of knowledge of this system between low and null; however, students in these two levels reveal that, during their majors, they have strengthened their investigative skills over those in the last semesters of their majors (7th, 8th, 9th and 10th semester).

Regarding students’ willingness in participating in a research-based practicum, those who felt trained in Qualitative Observation Techniques and Development of Scientific Method showed a higher interest (69% and 67%). However, a large portion of the students who believe that they have strengthened Database search skills expressed that they were not interested in this type of research process (43%). Considering that in the analysis of the profile of the students surveyed, the ones who showed increased interest in participating in research-based practicum were students of basic and intermediate levels, it’s possible to conclude that reinforcing research tools will have an impact on students feeling to be capable of participating in research, and thus considering the possibility of a research-based practicum.

This study also explored students’ perception of the most important things to consider when developing a research process; seen that participating in research represents an additional effort to them, there are several factors that can influence their decision to take an active part in a research project. Within these factors are the accompaniment of a professor, the financial rewards that can be obtained in the course of the project, the dedication required by the project and how the experience impacts their resume. Consequently, the study seeks to identify whether students’ perception affects their participation in a research-based practicum and if there is a relationship between such perception and the degree of knowledge they may have of the university research system (see Table 3)

Table 3: Most important factors when investigating

	Level of advancement			Level of Knowledge				Interest to conduct research practices		
	Basic	Intermediate	Advanced	High	Medium	Low	Null	Yes	No	NA
Teacher tutoring	58%	53%	56%	74%	55%	43%	61%	61%	49%	50%
Time to investigate	46%	64%	71%	52%	62%	60%	61%	58%	60%	71%
Ability to generate new knowledge	58%	44%	31%	43%	45%	48%	44%	49%	40%	43%
Ability to publish this research	19%	31%	31%	22%	34%	27%	25%	25%	32%	14%
Economic retribution	10%	14%	20%	26%	28%	9%	10%	13%	15%	21%

Table 3 shows that basic level students consider that the most important factor when undertaking research is the guidance of a professor (58%) and the possibility of generating new knowledge (58%). The intermediate level was characterized by considering the time factor as the priority to start an investigation (64%) same as the advanced level students (71%). It was also found that students at this level considered the financial rewards they can get through their participation in research as an important factor (20%). This may be explained by the fact that last semester students seek the opportunity to generate income based on their status of progress in the

curriculum; in addition, advanced level students are mostly between the ages of 21-24 and 30-43. This finding corroborates previous studies that claim that economic compensation is relevant when undertaking research (Osamor & Kass, 2012).

Regarding the degree of knowledge of students, findings showed that those with a high knowledge of the research system consider the guidance of a professor essential (74%); meanwhile, those with medium and low knowledge consider the time that developing a research process implies as the most important factor (62% and 60% respectively). Finally, the ones who have no knowledge of the system consider tutoring and time as the most important variables (61% both). Sixty-one percent (61%) of those students interested in conducting a research-based practicum state that the most important factor to consider is the guidance of a professor and still those who are not interested believe that to be a relevant factor.

Time is an influential factor when considering participating in research processes; both those who are interested in conducting a research-based practicum and those who are not consider it a significant variable (58% and 60% respectively). By the same token, the economic reward is a more important factor for those who are not interested in this type of practicum (15%) than for those who are (13%). This may be because, from their point of view, the time that must be spent in such process should be rewarded financially even when they are not interested in participating.

CONCLUSIONS

The analysis of the findings in this study suggests that the most important situation to evaluate in regards to the development of research processes at the Faculty of Economics and Management Sciences at UNIMINUTO is the role being played by the outreach activity of the Research System itself inside the institution. Through the analysis of surveys and interviews, it's shown that there is a general lack of students' knowledge about the research approach of the institution and opportunities such as publications and hotbeds of research that they have to participate. On the other hand, results showed that professors are familiar with research in their areas but unfamiliar to some extent with what happens in other fields of knowledge within the same institution.

Despite the low participation of students in research processes, such as hotbeds of research within UNIMINUTO, it seems that they associate research with an enriching, innovative activity that trains and provides development; this may be an indicator of potential in the minds of students in order to achieve connecting classrooms with research processes and thereby, not only fostering a research culture, but also directing research towards the interests of students. In this regard proposing research methodologies that encourage this process and evaluating their success seems interesting for further research.

Likewise, it was found that in the course of their training at UNIMINUTO, students strengthen scientific skills such as information analysis, using APA standards and searching databases; all this leads to the formation of a research culture within the institution. At the same time, it's observed that the time invested is a crucial variable in students' participation in research processes, which may be due to many of the students surveyed being people who work and study in a parallel manner. Time is the most important factor to consider when undertaking research and express no to be motivated to carry out a research-based practicum because the time that it demands.

At UNIMINUTO it seems to be high potential to conduct research: both professors and a large number of students want to participate in investigative processes. Low level of research thus appears to reside (1) on the poor promotion of research opportunities done by the system itself, on the one hand, and (2) on the perception of mostly working students about research to be time consuming and not economically rewarding, on the other. As a consequence, much of the university community is not aware of the fields and research lines that exist at UNIMINUTO and do not perceive participating in such processes as a valuable achievement.

In the field of expectations, it is advisable to begin forming professor researchers in a more appropriate manner so that they have concepts clear at the time of transmitting them to their students. Equally, it's property start projecting and forming lines with a more external focus (open to other communities) and more linked to new technologies; students and teachers are expected to generate new knowledge and have the ability to transmit it to others, positively impacting on society, but without avoiding feedback from other research groups and/or research hotbeds.

REFERENCES

- Adedokun, O., & Burgess, W. (2011). Uncovering Students' Preconceptions of Undergraduate Research Experiences. *Journal of STEM Education: Innovations and Research*, 12(5), 12-23.

- Åkerlind, G. S. (2008). An academic perspective on research and being a researcher: an integration of the literature. *Studies in Higher Education*, 33(1), 17-31.
- AlGhamdi, K. M., Moussa, N. A., AlEsa, D. S., AlOthimeen, N., & Al-Saud, A. S. (2014). Perceptions, attitudes and practices toward research among senior medical students. *Saudi Pharmaceutical Journal*, 22(2), 113-117.
- Ambrose, S. A., Bridges, M. W., DiPietro, M., Lovett, M. C., & Norman, M. K. (2010). *How Learning Works: Seven Research-Based Principles for Smart Teaching*. San Francisco: John Wiley & Sons.
- Bolin, B. L., Lee, K. H., GlenMaye, L. F., & Yoon, D. P. (2012). Impact of Research Orientation on Attitudes Toward Research of Social Work Students. *Journal of Social Work Education*, 48(2), 223-243.
- Carreño, M. T. (2011). La investigación, una competencia para el estudiante de derecho. *Jurídicas*, 8(2), 107-118.
- Diamond, J., & Rush, L. (2012). Intra-organisational collaboration in one UK university: potential for change or missed opportunity. *International Journal of Public Sector Management*, 25(4), 287-300.
- Irvine, J., & Martin, B. R. (1984). *Foresight in science: Picking the winners*. London: Pinter Pub Ltd.
- Jusoh, R., & Abidin, Z. Z. (2012). The Teaching-Research Nexus: A Study on the Students' Awareness, Experiences and Perceptions of Research. *Procedia - Social and Behavioral Sciences*, 38, 141-148.
- Kardash, C. M., Wallace, M., & Blockus, L. (2008). Science Undergraduates' Perceptions of Learning from Undergraduate Research Experiences. En R.L. Miller, R.F. Rycek, E. Balcetis, S.T. Barney, B.C. Beins, S.R. Burns, R. Smith & M.E. Ware (eds), *Developing, promoting, and sustaining the undergraduate research experience in psychology* (258-263). Washington: Society for the Teaching of Psychology.
- Kyvik, S., & Olsen, T. B. (2012). The relevance of doctoral training in different labour markets. *Journal of Education and Work*, 25(2), 205-224.
- Licona, A., & Rangel, J. (2012). Inversión en investigación y desarrollo. Los casos de la República de Corea y México. *Portes: Revista Mexicana de Estudios Sobre la Cuenca del Pacifico*, 6(12), 99-125.
- Mayorga, F. (2001). Proyecto de mejoramiento de la gestion de la investigacion en la UMSS. En *Antecedentes de la universidad boliviana* [En-línea]. Disponible: <http://www.umss.edu.bo/epubs/earts/downloads/54.ps.gz>.
- Mazurkiewicz, O., & Potts, C. H. (2007). RESEARCHING LATIN AMERICA. A Survey of How the New Generation is Doing its Research. *Latin American Research Review*, 42(3), 161-182.
- Osamor, P. E., & Kass, N. (2012). Decision-making and motivation to participate in biomedical research in southwest Nigeria. *Developing world bioethics*, 12(2), 87-95.
- Prosser, M., Martin, E., Trigwell, K., Ramsden, P., & Middleton, H. (2008). University academics' experience of research and its relationship to their experience of teaching. *Instructional Science*, 36(1), 3-16.
- Rip, A. (2011). The future of research universities. *Prometheus*, 29(4), 443-453.
- Rojas, M. (2010). Students' Attitude Towards Research in the University. *Investigación y Desarrollo*, 18(2), 370-389.
- Vázquez, E. (2014). Importancia de la Investigación en la Formación de los Médicos Residentes. *Boletín Clínico Hospital Infantil del Estado de Sonora*, 31(2), 63-65.
- Wells, M. (2006). Teaching Notes: Making Statistics "Real" for Social Work Students. *Journal of Social Work Education*, 42(2), 397-404.

Individual Factors that Encourage the Use of Virtual Platforms of Administrative Sciences Students: A Case Study

Alejandro Valencia Arias

Instituto Tecnológico Metropolitano, Colombia
jhoanyvalencia@itm.edu.co

Salim Chalela Naffah

Universidad Autónoma Latinoamericana, Colombia
salim.chalela@unaula.edu.co

Jonathan, Bermudez Hernández

Instituto Tecnológico Metropolitano, Colombia
jonathanbermudez@itm.edu.co

Luz Mirelia Bedoya Pérez

Institución Universitaria ESCOLME, Colombia
ciesadministracion1@escolme.edu.co

ABSTRACT

Higher education Institutions have incorporated into their educational processes the virtual learning platforms use, in their search to answers to the dynamic and changing needs of young students, thus students have practical training in the use of information technologies and communication (ICT) in their courses. However, few studies have been developed in developing countries to understand the motivating factors of the virtual learning platforms use of undergraduate students.

Based on this need, this research aims to examine the individual factors that encourage the virtual platforms use in university students from the city of Medellin, taking as a case study the population of undergraduate students of management sciences from the Universidad Autónoma Latinoamericana, the Institución Universitaria Escolme and the Instituto Tecnológico Metropolitano.

The proposed methodology is descriptive type through a quantitative methodological design, where a self-administered questionnaire was used as instrument and applied to 270 university students from the city of Medellin. Between the main results it is observed although most of undergraduate students have used virtual learning platforms and have low frequency platforms use per week. In addition, it is noted that the factors who have influence in the positive attitude of respondents to the virtual learning platforms use are the innovative personnel, ability for self-learning, and self-efficacy and personal perception.

Keywords: University students, Attitude, virtual learning platforms, encouragement

BACKGROUND

Abbad, Morris & Nahlik (2009) consider e-learning refers in general sense to any learning that is electronically activated. In a more specific sense, e-learning refers to that learning more focused and enabled by the digital technologies application. It becomes to any learning that is based on the Web. In other words, e-learning is a distance education, where students learn through the Internet, without face to face contact with their teachers, who are usually in a different location (Teo, 2010).

E-learning is considered as an alternative to learning, is becoming as widespread method in higher education institutions worldwide, according Garrison and Anderson (2003, cited by Persico, Manca, & Pozzi, 2014), in many cases, the aim is to determine a profound change in the way which teaching and learning take place in universities. The e-learning has taken into account in educational centers in recent years, considered as a new paradigm in modern educational methods, which changes the behavior of individuals in function of technological advances of the 21st century (Calli, Balcikanli, Calli, Cebeci & Seymen, 2013).

In this sense, in recent decades universities have gained much experience in the application of Information and Communication Technologies (ICT) in education management. However, Lu (2012) suggests that the adoption of e-learning remains relatively new to many universities and therefore these are faced to new challenges in e-learning management systems building, complicating their integration into existing information systems in the campus.

For Teo (2011) e-learning is one of the most productive pedagogies in modern educational practice, with great potential to obtain impact on teaching and learning, which is limited by the physical location and various social needs, and other aspects. In many developing countries, where universities are concentrated in major cities, those interested in professionally training have difficulties to accessing on-campus education, where have direct contact with teachers and have the appropriate learning materials, due to the impossibility to commute to urban centers, which makes the availability of learning resources limited to the town where they are. Then, the e-learning appears as an alternative to increase the coverage of education. E-learning allows students located in a secluded or inaccessible places learning from instructors who are elsewhere, overcoming the physical limits and in many cases, the lack of time. Thus, e-learning has the potential to provide equity in access to higher education.

According to Bouhnik and Marcus (2006; cited by Calli, et al., 2013), the four fundamental benefits of e-learning are: the freedom to decide when to take each lesson online, the decreasing dependence on the availability of teacher's time; the freedom to express thoughts and ask questions without limitations, and the accessibility to online course materials whose effectiveness will be largely determined by the student. Furthermore, they add to the four above benefits, other proposed by Capper (2001) specifically for education, such as the advantages in terms of time, place, interaction, collaboration and modern teaching methods. Also, it supported by Liaw and Huang (2007), who emphasize three important elements to consider when the e-learning environment is developed: environmental characteristics, collaborative activities (learning), and the characteristics of the students.

On the other hand, e-learning has as disadvantage the complexity of its implementation, because the availability of a technological infrastructure is not sufficient to determine the uptake with new approaches, whether in the case of teachers or students, and even online universities, which have no experience in the tradition of on-campus teaching. Innovative methods often fail to be adopted because of various reasons such as the university staff that should be trained not only in the use of technology, but also in new methods of online collaboration, in other words, teaching tools in accordance to this type of teaching, and the organization of the university must be suitable for the purpose, including student expectations and learning habits can explain the success or failure of online learning environments (Piskurich, 2003; cited by Persico, Manca & Pozzi, 2014).

Precisely considering the disadvantages that entailed to the risk of failure in the implementation of an e-learning environment, a number of research articles have been developed, some of them approach the subject from the study of critical success factors of e-learning. To identifying some of these critical factors Selim (2007) found a variety of different authors' contributions, for example found that Papp (2000) explores distance education from a macro perspective and suggests some critical success factors that can help universities and teachers in developing e-learning environments, which include intellectual property, the suitability of the course for the e-learning environment, the construction of the course, the course content, the technological infrastructure, where the bandwidth, hardware reliability, network security and accessibility, and how to measure the success of the course are critical variables, which Benigno and Trentin (2000; cited by Selim, 2007) propose to focus on two aspects, the first assesses the learning, and the second evaluates the performance of students. In this case, factors such as the characteristics of the student, the student-student interaction, the effective support of tutors or facilitators, the quality of learning materials, and the learning environment and information technology used are considered.

Another critical success factor (hereinafter CSF) is the student commitment in learning models, even with the possibility of communication in real time, anytime and anywhere, students must be motivated and committed, because in courses based on e-learning, students take responsibility for their learning speed (Selim, 2007).

In the same field of technological aspects, Volery and Señor (2000) identify three critical factors in e-learning: the technology, considering the ease of access and navigation, interface design and the level of interaction; the teacher attitudes toward students, their technical competence and the teacher interaction in the virtual classroom; and the previous use of technology from the student perspective.

In the same way, Soong Chan, Chua and Loh (2001) through a multiple case studies, verify that the critical aspects of e-learning are: human factors such as the technical competence, the mentality of e-learning and level of collaboration of the instructors and students, and the perception of information and technology infrastructure. Therefore, they recommend that all these factors should comprehensively be considered by the adopters of e-learning. Govindasamy (2002) in his research discussed seven parameters of e-learning quality: the institutional support, development of courses, teaching and learning, course structure, student support, teachers support, and evaluation. At same year Helmi (2002) concluded that information technology, market demand, and schools and universities are the motivating forces of e-learning.

Additional to the e-learning description concept, advantages, disadvantages and critical success factors, Ong & Lai (2006) consider that gender differences also play an important role in e-learning, despite is a relatively new technology. Then, it suggested that gender differences in e-learning have to be examined.

METHODOLOGY

For this article was conducted a descriptive field research based on a quantitative methodological design, which involved in the application of a self-administered questionnaire to 250 undergraduate students of management sciences at Universidad Autónoma Latinoamericana, the Institución Universitaria Escolme and the Instituto Tecnológico Metropolitano, where students were selected through a non-probability sampling criterion. Students should be undergraduate enrolled students for the 2014-02 semester. The questionnaire included dichotomous questions and Likert scale questions in a level 5th (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree) designed to measure each of the constructs and factors specified in the proposed model (see Figure 1).

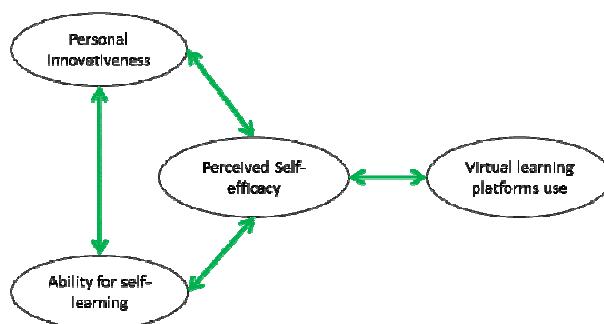


Figure 1 Proposed model.

This model searches for exploring the relationship between personal innovativeness factors, the ability for self-learning and self-efficacy and personal perception of surveyed students. It is important emphasizing the factors discussed in the proposed model are not directly observable constructs, so many questions were developed and compiled to identify each evaluated constructs.

ANALYSIS OF RESULTS

Initially, there are a predominance of women in surveyed students (54.4%) compared to men (43.6%). Likewise, it is important to note that the highest percentage of respondents is in a range of age over 26 years (48.4%), because most of the institutions surveyed are focused on people immersed in work context.

On the other hand, a related characterization was performed with the enjoyment of taking fully virtual courses Vs frequency of weekly use of e-learning tool available in each institution. The results are shown in Table 1.

Table 1 - Frequency of use vs Virtual Courses

Liking for virtual courses	Frequency of use				Total
	More than 6 times a week	5 to 6 times per week	Never	DK/NA (Don't know / No answer)	
Yes	38,0%	10,0%	7,6%	0,0%	55,6%
No	23,2%	6,8%	8,0%	1,6%	39,6%
Total	61,2%	16,8%	15,6%	1,6%	95,2%

Source: compiled from data collected in the survey applied

First, it is observed about 56% of students express an enjoyment for fully virtual courses, compared to 40% do not. It is important to note that the percentage of this and other analyzes do not reach 100%, since all questions were not answered in the survey.

On the other hand, it is identified that there is a tendency for students to enter the platform more than 6 times per week, 61% said this alternative, compared with 31% who makes 5-6 times or not. In this regard, it is important

to identify the participating institutions of measurement and strategies to increase levels of use of e-learning platforms.

For purposes of this research, personal innovativeness factors, ability to learn independently and self-efficacy and personal perception are taken into account to assess student motivation over the virtual platforms use. Below is presented an analysis carried out for each one of them (Table 2).

Table 2. Personal innovativeness factors

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I like learning about new information and communication technologies (ICTs)	40,0%	43,2%	11,2%	2,8%	1,2%
I believe between my classmates, I am of the first to try new technological tools	19,2%	29,2%	31,2%	12,4%	2,4%

Source: compiled from data collected in the survey applied

This factor is oriented to assess students' attitudes toward the new technologies use by their own choice. For the case study of this paper, through two questions of self-administered questionnaire to students were evaluated. First, the enjoyment to know new information and communications technology was researched, where it is observed that about 83% are agree and strongly agree that this reflects their attitude. This result is important and very relevant to determine the use of learning platforms while these are based precisely on the new ICT.

Furthermore, students were asked if they were the first to try the new technology tools versus their classmates, and in this scenario the acceptance rate is not highlighted, only 48% expressed identification with this aspect. These two elements show an interesting contrast, while they manifest enjoyment for new information and communication technologies, and there is no evidence of interest in being the first to use these new technologies more than their peers.

Table 3 shows the results for self-learning factor. This factor becomes important to establishing incentives of virtual platforms use, being one of the key success factors identified in the literature to ensure a proper implementation of these platforms.

Table 3. Self-learning factor

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I think using the virtual platform in subjects, improve my abilities to learning	18,0%	46,4%	20,0%	9,6%	3,2%
I like to be independent in my learning speed.	31,2%	46,4%	14,0%	5,6%	1,6%

Source: compiled from data collected in the survey applied

In this regard, it is important to emphasize the two results that can be seen. About 77% of students are agree and strongly agree with the enjoyment to have an autonomous speed in their learning processes. However, only 64% of students express that the use of these platforms improve their abilities on learning. These two elements become interesting, because the participant institutions of the measurement have a self-learning characteristics in their learning students' processes, but they do not show a direct improvement in their subjects supported on platforms, making it a challenge for universities in the sense of designing strategies for their students that actually they perceive as a contribution in their learning processes.

Finally, the factor of self-efficacy was assessed, and it was found more stable results in the questions associated. Table 4 shows the 75% of surveyed students are agree and strongly agree with having the appropriate tools to improve their learning processes with the help of the virtual platform. This result is interesting if is compared with the showed results in Table 3 related to the perception of improvement of learning abilities with the use of these platforms, since they recognize their abilities to improve their educational processes, but not yet identify that improvement. This comparison confirms the challenge that higher education institutions surveyed have, while their students confirm that they have the required abilities, but not evidence an improvement in their learning abilities. In the same vein, it is interesting that these institutions implement strategies to get the best benefit from the abilities that students report having to use the university virtual platforms.

Table 4. Perceived Self-efficacy

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I have the appropriate abilities to improve my learning using the virtual platform.	21,2%	54,0%	16,8%	3,6%	2,4%
I have the required knowledge to use virtual learning tools available on the virtual platform.	26,0%	47,6%	13,2%	8,4%	2,4%

Source: compiled from data collected in the survey applied

On the other hand, it is observed that about 73% of students confirm that they have the required abilities to using virtual platforms. This result could not be more explained above. Not only they have the abilities but they have required knowledge to using these platforms. In this sense, the future outlook for the participating institutions is very positive and has numerous possibilities to encourage and increase the use and success results in the use of virtual platforms in their students.

ANALYSIS OF RESULTS OF PROPOSED MODEL

At first, the Cronbach's alpha was applied, which evaluates how the questions and constructs are related (Oviedo & Campo-Arias, 2005). This value should be close to or higher than 0.7 in order to generate a high reliability of the measurements of constructs. In this case, the alpha values swing between 0.710 and 0.806 (average 0.754), so it is considered an appropriated indicator (Table 5).

Table 5. Reliability indices of the scale applied.

Factor	Alpha
Personal Innovativeness	0,746
Ability for self-learning	0,710
Perceived Self-efficacy	0,806

Source: compiled from data collected in the survey applied

To quantify the existed relation between model's variables, Cramer's V coefficient was used (Seo & Gordish-Dressman, 2007) because this allows concluding about the statistical independency of the variables in an independent way of the number of categories of the analyzed variables. Table 6 shows a consolidated of interdependence between the proposed model's factors using Cramer's V coefficient.

Table 6. Cramer's Coefficient – Correlation

Cramer's Coefficient – Correlation				
	Personal Innovative ness	Ability for self-learning	Perceived Self-efficacy	Virtual learning platforms use
Personal Innovativeness	1,0	0,326	0,415	--
Ability for self-learning	0,326	1,0	0,429	---
Perceived Self-efficacy	0,415	0,429	1,0	0,405
Virtual learning platforms use	--	---	0,405	1,0

Source: compiled from data collected in the survey applied

Table 6 shows that there is a strong relation between “ability for self-learning” and “perceived self-efficacy” (0,429), between “personal innovativeness” and “perceived self-efficacy” (0,369) and an average relation between “ability for self-learning” and “personal innovativeness” (0,326). The relation of the total sample of surveyed students toward the proposed model in the methodology can be visible in the figure 2.

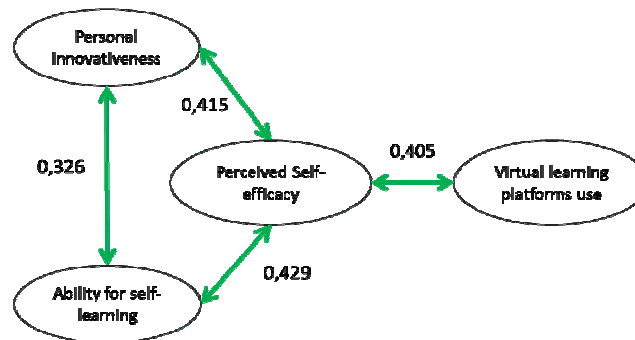


Figure 2. Proposed model results.

The results corroborate the point made by Agarwal and Prasad (1998) about the influence of personal innovativeness in the use of information technology. Moreover, it is confirmed the statement by Lu, Yao and Yu (2005, p. 245), who argue that “Behavioral sciences and individual psychology, however, suggest that social influences and personal traits such as individual innovativeness are potentially important determinants of adoption as well, and may be a more important element in potential adopters' decisions”. The issue raised by Swingle and Vieta (2012) is also confirmed. They state that self-efficacy is established as one of the factors behind the adoption of virtual learning technologies and the future academic success of students in virtual training programs. It becomes a future work to evaluate how these factors influence the academic success of students in virtual classes.

CONCLUSIONS

It is important to note that a low usage platforms by surveyed students of the participating institutions. This use is measured on the entry frequencies in virtual platform. In this regard different alternatives for encouraging user to entry at platforms should be established, so there is the possibility that various features and advantages offered can be explored and internalized better.

While it is note a marked tendency in students of these institutions toward the abilities and required knowledge to use virtual platform. A high recognition compared to support provide by these tools in the learning processes of users is not observed. To such an extent that, it is important that self-learning factor is stimulated, while it becomes one of the relevant factor for students to generate motivation on the use of virtual platforms.

It is observed though obtain results that the personal innovativeness presents important elements in students' motivation toward the virtual platform use, while show a high degree of affinity with the exploration of new information and communication technologies. However, it is important to note that there is no a strong tendency to be between the first students to explore these tools. Therefore, it is important obtain an environment which users feel strong motivation to interact with these platforms in the moment that are incorporated into the learning process and thus, increase its use and enhance the results that may occur.

REFERENCES

- Abbad, M. M., Morris, D., & De Nahlik, C. (2009). Looking under the bonnet: Factors affecting student adoption of e-learning systems in Jordan. *The International Review of Research in Open and Distributed Learning*, 10(2).
- Agarwal, R., & Prasad, J. (1998). A conceptual and operational definition of personal innovativeness in the domain of information technology. *Information systems research*, 9(2), 204-215.
- Calli, L., Balcikanli, C., Calli, F., Cebeci, H. I., & Seymen, O. F. (2013). Identifying Factors that Contribute to the Satisfaction of Students in E-Learning. *Turkish Online Journal of Distance Education*, 14(1), 85-101.
- Capper, J. (2001). E-learning growth and promise for the developing world. *TechKnowLogia*, 2(2), 7-10.
- Govindasamy, T. (2001). Successful implementation of e-learning: Pedagogical considerations. *The Internet and Higher Education*, 4(3), 287-299.
- Helmi, A. (2001). An analysis on the impetus of online education: Curtin University of Technology, Western Australia. *The Internet and Higher Education*, 4(3), 243-253.
- Liaw, S. S., Huang, H. M., & Chen, G. D. (2007). An activity-theoretical approach to investigate learners' factors toward e-learning systems. *Computers in Human Behavior*, 23(4), 1906-1920.
- Lu, H. K. (2012). Learning styles and acceptance of e-learning management systems: an extension of behaviour intention model. *International Journal of Mobile Learning and Organisation*, 6(3-4), 246-259.

- Lu, J., Yao, J. E., & Yu, C. S. (2005). Personal innovativeness, social influences and adoption of wireless Internet services via mobile technology. *The Journal of Strategic Information Systems*, 14(3), 245-268.
- Ong, C. S., & Lai, J. Y. (2006). Gender differences in perceptions and relationships among dominants of e-learning acceptance. *Computers in Human Behavior*, 22(5), 816-829.
- Oviedo, H. C., & Campo-Arias, A. (2005). Aproximación al uso del coeficiente alfa de Cronbach. *Revista colombiana de psiquiatría*, 34(4), 572-580.
- Papp, R. (2000). Critical success factors for distance learning. *AMCIS 2000 Proceedings*, 104.
- Persico, D., Manca, S., & Pozzi, F. (2014). Adapting the Technology Acceptance Model to evaluate the innovative potential of e-learning systems. *Computers in Human Behavior*, 30, 614-622.
- Selim, H. M. (2007). Critical success factors for e-learning acceptance: Confirmatory factor models. *Computers & Education*, 49(2), 396-413.
- Seo, J., & Gordish-Dressman, H. (2007). Exploratory data analysis with categorical variables: An improved rank-by-feature framework and a case study. *International Journal of Human-Computer Interaction*, 23(3), 287-314.
- Soong, M. B., Chan, H. C., Chua, B. C., & Loh, K. F. (2001). Critical success factors for on-line course resources. *Computers & Education*, 36(2), 101-120.
- Swingle, N. C., & Vieta, V. C. (2012). ¿ Está la generación en línea preparada para el aprendizaje en línea? Un estudio de percepciones de auto-eficacia sobre las tecnologías on line como predictores del éxito académico en programas de formación virtual. *Revista Complutense de Educación*, 23(1), 135-147.
- Teo, T. (2010). Development and validation of the E-learning Acceptance Measure (ElAM). *The Internet and Higher Education*, 13(3), 148-152.
- Teo, T., Wong, S. L., Thammetar, T., & Chattiwat, W. (2011). Assessing e-learning acceptance by university students in Thailand. *Australasian Journal of Educational Technology*, 27(8), 1356-1368.
- Volery, T., & Lord, D. (2000). Critical success factors in online education. *International Journal of Educational Management*, 14(5), 216-223.

Preferences and Willingness for Participating MOOCS in Turkish

İrem Erdem-Aydin

*Anadolu University, Turkey
ieaydin@anadolu.edu.tr*

ABSTRACT

The goal of this study is to explore preferences of the experts, students, faculty, and administrators in the field of academic computing regarding the Massive Open Online Courses (MOOCs). This descriptive study was conducted during the Academic Informatics 2015 Conference held during 31 January – 6 February 2015, Anadolu University, Eskisehir, Turkey. An online questionnaire was used to gather data. The results have revealed that there is a strong will among the participants of the study to take MOOCs on computing (programming, software engineering, etc.), open and distance learning tools and applications, as well as some topics in social sciences, personal development and hobbies. It was also noticed that male participants in the range of ages 17-24 show more interest in taking MOOCs among all the groups.

INTRODUCTION

It is non-contestable that there is an effect of the changes and developments in technology on every aspect of our daily lives. Education is one of these aspects or field influenced by the continual innovations and developments in technology. The emerging technologies enable equal access to standardize and quality education to all who wish for. The Massive Open Online Courses (MOOCs) can be considered as one of the artifacts of this trend.

MOOCs are defined as online courses that ensure large-scale interactive participation and aim for open access through the Web, where individuals may enroll and follow up the content. Instruction is delivered via videos, texts, quizzes, discussion forums, blogs and so forth. Initial idea behind MOOCs was, by using the potential of technology, to establish a network of people who share the same interest on a topic to learn and share their experiences. The first MOOC, the Connectivism and Connective Knowledge (CCK08), offered by George Siemens and Stephen Downes in 2008. Siemens and Downes followed a connectivist learning approach where learners were encouraged to control their own learning process, to engage with dialogue and exchange of ideas with others on the network, and to follow an informal learning path based-on their preferences through any social media they choose (Hermann, 2012). The success of connectivist MOOCs led to Stanford AI-based MOOCs. Sebastian Thrun and Peter Norvig used MOOC concept to teach Artificial Intelligence in 2011. They used a system developed by Amazon through algorithms to assess and evaluate enrolled students (Stevens, 2013). In 2012, Udacity, Coursera and MIT edX were founded to provide MOOCs (Martin, 2012). However, the MOOCs offered by or via these for-profit or semi-commercial institutions followed classical instructional strategies such as short-lectures, assignments, discussions and exams (quizzes, etc.). In order to differentiate, those MOOCs promoted connectivist approach is entitled as cMOOCs (c as c in connectivist) and others as xMOOCs (x as a acronym for extended).

The term MOOCs first used by Dave Cormier and Bryan Alexander (Hermann, 2012). It is an acronym for “Massive Open Online Course”. In this definition, “M” refers to the word massive. Even though it is primarily used for the number of participants, Levy (2011) states that massive also covers participants’ diversity, the kinds of backgrounds and experiences, the communication tools, the web technologies, the amount of distributed knowledge and the complexity of the distribution, the overwhelming width and depth of discourse among the participants, the multi-modal nature of the discourse, and finally the massive amount of time needed to manage and organize. The second letter “O” refers to the word open. Openness means to be free to join, create, interact, analyze, and reflect according to participants’ own learning needs (Koutropoulos et al, 2012). Openness embraces all levels of engagement, with no barriers between in and out (Downes, 2008). Openness and flexibility help to maintain the free flow of information through the networks, and encourages a culture of sharing and a focus on knowledge creation (Mackness, Mak & Williams, 2010). On the other hand, “O” refers to the word online, which means the course environment where the important key terms are the Internet, Web and networks for a MOOC. The final letter “C” refers to the word Course, which means implementing an educational plan with a pedagogical approach in MOOCs.

Hollands and Tirthali (2014) have expressed that MOOCs will serve many purposes. They might be considered as a significant step for democratization of education due to ability to reach more individuals with quality learning materials. So, they support social inclusion and provide an opportunity for participants to experience being part of a global community of peers. Also, carefully designed MOOCs might have a reflection on increasing the quality of both face-to-face and online courses. Similarly, Barber, Donnelly, and Rizvi (2013)

used the term avalanche for MOOCs as a metaphor that will transform higher education. According to these and some other experts MOOCs are sort of a premise of a larger modernization of higher education worldwide that is closely related to unbundling and economic sustainability of higher education. Daniel (2012) additionally, indicated that MOOCs are the new openness movement and it has potential to widen access to life-long learning not only in the underdeveloped or developing countries but also in the developed regions of the world.

However, there are opposing arguments against the MOOCs movement. Experts, such as Barlow (2014), Krause and Lowe (2014), and Peters (2013), argue that MOOCs movement is nothing else but a marketing tool for universities, another neo-colonialist instrument, an expression of Silicon valley neo-liberal values, a kind of entertainment media, a new business model for reducing public funding for universities, and the creation of a global higher education digital marketplace. Furthermore, high dropout rate and characteristics of the participants are two other points highlighted in a number of critics. It is now a fact that only a small portion of learners (average 10 percent) completes MOOCs (Breslow, Pritchard, DeBoer, Stump, Ho, & Seaton, 2013; Yuan & Powell, 2013) and many acts as lurkers (Bozkurt & Aydin, 2015; Christensen, Steinmetz, Alcorn, Bennett, Woods, & Emanuel, 2013). It sees that Nielsen's '90-9-1 rule' can be applied to the situation in MOOCs. According to Nielsen (2006), in any initiative 90 percent of the users are lurkers: they read or observe but do not contribute; 9 percent contribute from time to time but other priorities dominate their time; and, 1 percent of users take active part and account for most contributions. The participants' characteristics also do not reflect the MOOCs advocates' claims regarding democratization of education, equal learning opportunity, etc. Studies have shown that the participants tend to be young, well educated, and employed, with a majority from developed countries. There are significantly more males than females taking MOOCs, especially in developing countries. Students' main reasons for taking a MOOC are advancing in their current job and satisfying curiosity (Gaebel, 2013; Wang & Baker, 2015).

In terms of Turkey, MOOCs offerings as well as are still in infancy stage even though there is quite a number of participants to MOOCs in the Coursera, edX, and others. The first attempt to offer MOOCs was made in 2013 by Anadolu University a dual mode public higher education institution that has been providing distance higher education to millions through out the country, Europe, west Asia, Middle East, and Balkans. However, due to low enrolment and lack of support these courses could not launched. Later, in 2014, Koc University initiated a project to translate some of Coursera courses into Turkish, and later in the same year, they designed and offered a course in Turkish in Coursera. At the end of 2014, Erzurum Ataturk University and Anadolu University announced their MOOC platforms and offerings. Atademix is the name to the Ataturk University's MOOCs platform developed on the Moodle infrastructure. Currently there are 15 courses in this platform (atademix.atauni.edu.tr). A few months before the launch of Atademix, Anadolu University has introduced its AKEDEMA platform and courses. AKEDEMA is a custom developed platform based-on SharePoint infrastructure. Rational behind design and development of a custom platform was the create a platform that suits the Turkish students' cultural and learning characteristics. Currently 58 courses offered in this platform with no fees. The university stated the goal of the project as to meet the lifelong learning needs of individuals of all ages and education levels. The course subject areas vary from computing skills and business management to communication and childcare. Along with these two projects, there is couple more initiatives declared as MOOCs projects, such as Turkcell Academy's self-paced courses (in collaboration with MIT and Khan Academy), the OpenCourseWare Project of the TUBITAK's (Turkish Academy of Sciences, and the Scientific and Technological Research Council of Turkey) 5000 grants (Aydin, 2015). However, these projects cannot be classified as MOOCs rather open education resources (OER). Moreover, there is no research study on Turkish MOOC participants. Specifically, no scientific data is available concerning the Turkish people's willingness to take a part in MOOCs and their preferences of courses, course materials.

As one easily can interpret that MOOCs are still new to Turkey but the current initiatives are quite promising. In order to provide better flexible learning opportunities there is a need for research studies. Liyanagunawardena, Adams and Williams (2013) conducted a review of available MOOC literature between 2008 and 2012 and found out that most articles published so far have dealt with empirical evidence from case studies, MOOCs' influence on higher education structure, or educational theory relating to MOOCs. The researchers in this study noted that there is a lack and a severe need for studies on MOOCs participants' preferences and attitudes in different contexts in order to design better learning processes in MOOCs.

PURPOSE AND RESEARCH QUESTIONS

This study addresses the above problem, exploring the Turkish people's preferences and willingness regarding MOOCs. More precisely the study intended to explore willingness of the experts, students, faculty, and administrators in the field of academic computing to attend MOOCs and their preferences. The answers of the following research questions were sought in the study:

1. To what extent, do the participants have MOOC experience?
2. To what extent, are the participants of the study willing to participate MOOCs offered in Turkish?
3. What topics do the participants prefer to take in Turkish MOOCs?

METHODOLOGY

A descriptive method was employed in this study. The study was conducted during an academic conference, organized annually by the Turkish Association for Internet Technologies (INETD). INETD is a civic organization (NGO) intended to facilitate advancement of Internet in every aspects of Turkish society, to create a platform where interest groups can come together and discuss the issues, trends, and problems concerning the Internet in Turkey (INETD, 2015). One of the activities of this organization is the Informatics in Academia Annual Conference. The main goal of the Informatics in Academia Conference is to bring all the students, faculty, experts, staff, and administrators interested in information and communication technologies (ICT) in the Turkish higher education institutions together and discuss various aspects of informatics in academia, including technology integration into education, use of ICT in business management procedures, latest developments in computing sciences, digital art, and so forth. The Conference is considered as the largest event in Turkey that brings different interest groups from different subject areas together around the Internet or advance technologies. Similarly, the pre-conference workshops, mainly related to the Internet technologies, such as programming, big data analysis, openness, app development, etc. attract the largest participants in the country.

In 2015, INETD collaborated with Anadolu University to organize the conference. So, it was detained in Anadolu University, Eskisehir on 3-6 February 2015 and pre-conference workshops were also accommodated in Eskisehir on 31 January – 2 February 2015. Total, 100 trainers offered 4 days long workshops in 36 concurrent sessions to 1475 learners with varying backgrounds (students, staff, faculty, administrators, etc.). Originally, more than 3800 individuals applied to participate the workshops but only 1600 were accepted due to shortage of accommodation and seats in sessions. All these workshops, as a custom of INETD, were free to participants and the funding was provided via sponsors. After the pre-conference workshops, another 3800 registered individuals attended the three days long conference. Total 300 papers presented in 12 concurrent sessions, 22 panels, 10 workshops and 10 sponsor sessions were conducted during the conference.

An online survey, consisting of five questions along with age and gender related ones, was used to collect data. Of these questions four were open-ended and they were related to the participants' willingness to take MOOCs in Turkish, and in a Turkish platform as well as their preference of the topics in MOOCs. A close-ended question concerning the MOOCs experience of the participants was also included into the survey.

Table 1: Demographics of the participants

		N	%
Gender	Male	130	61.6
	Female	81	38.4
Age	17-24	95	45.02
	25-32	55	26.06
	33-40	47	22.27
	41-49	6	2.84
	50 +	8	3.79
TOTAL		211	

The online survey opened at the first day of the workshops and kept open until the last day of the conference. During these seven days, it was announced not only in the Conference Program booklet but also via print posters, Twitter and Facebook. Total 273 participants of the Conference and workshops responded the online questionnaire but only 211 answered all the questions. Thus, only these 211 were included into the analysis. Table 1 provides information about the demographics of the participants. As can be observed, approximately 62% of the participants are male and 38% are female. When we look at the age ranges of the participants, it is observed that more than 70% are 32 years of age or less. And, around 45% of this group is in the 17-24 years

range. This is followed by participants of 25-32 years of age by 26%. It is observed that the participants of forty years of age and above are at a total ratio of 7%.

During the analysis of the open-ended questions, the responses of the participants have been divided into meaningful sections and coded. Later these coded data have been assembled, classified and then themes have been determined. Another specialist has repeated the same procedure, and later, the generated codes and themes have been compared and the inter rater reliability of the data was calculated. In line with the obtained themes, the responses of the participants have been gathered under four headings. Meanwhile all the qualitative data was transformed to quantitative data. Finally, the findings have been discussed and interpreted within the scope of the relevant literature.

FINDINGS AND DISCUSSIONS

The reporting of the findings is organized according to the research questions. Below are the findings reached during this project. As can be observed in the Table 2, although more than half (57%) of the participants do not have any prior MOOC experiences at all, the ratio of those who have had an experience is not bad (43%). Since the participants were either students in higher education or academicians and administrators, it was expected to have a higher ratio in MOOC experience but this result should be interpreted as that MOOC movement is still in infancy stage in Turkey. Also, lack of MOOCs in Turkish and English language ability of the Turkish participants could be another factor affecting low attendance. The majority of the participants who have a MOOC experience are between 17-32 years old. This result supported the available literature where it was clearly indicated that mostly individuals younger than 30 years old attend MOOCs. On the other hand, gender distribution of those who have an experience uncovered a contradiction with the literature. Interestingly as many females as males had prior MOOC experiences. Christensen et al (2013), for example, reported significantly higher male participants than females in Coursera courses. This result can be interpreted as a consequence of the contexts of the study. Since a big majority of the participants was students in higher education. Also it is interesting to notice that percent of females who has not attended a MOOC twice the more than males.

Table 2. Participants' experiences in MOOCs and willingness to take MOOCs in Turkish

		%	Gender	%	Ages	%
Already attended a MOOC	Yes	43.2	Female	48.1	17-24	27.7
			Male	51.9	25-32	35.2
					33-40	31.5
					41-49	3.7
					50 +	1.9
	No	56.8	Female	69	17-24	57.8
			Male	31	25-32	16.9
					33-40	12.7
					41-49	5.6
					50 +	7
Completion of a MOOC	Enrolled but could not complete any	54.4	Female	35.3	17-24	45.5
			Male	64.7	25-32	28.8
					33-40	18.2
					41-49	4.5
					50 +	3
	Enrolled one and completed	14.4	Female	50	17-24	10
			Male	50	25-32	5
					33-40	3
					41-49	
					50 +	
	Enrolled more than one courses but completed only one	14.4	Female	50	17-24	55.5
			Male	50	25-32	27.8
					33-40	16.7
					41-49	
					50 +	

	Enrolled more than one courses and completed more than one	24.8	Female	41.9	17-24	42
			Male	58.1	25-32	16.1
					33-40	32.2
					41-49	3.2
					50 +	6.5
Willingness to take A Turkish MOOC	Definitely yes	53.6	Female	41.8	17-24	43.3
			Male	58.2	25-32	25.4
					33-40	23.9
					41-49	3
					50 +	4.4
	Depends on the topic	44.8	Female	33.9	17-24	43.6
			Male	66.1	25-32	25.5
					33-40	18.2
					41-49	1.8
					50 +	10.9
	Definitely no	1.6	Female	50	17-24	50
			Male	50	25-32	
					33-40	
					41-49	
					50 +	50

In terms of completion, the ratio of participants saying “I have enrolled in the course(s) but completed none” was 54.4%, those saying “I have enrolled in one course and completed it” was 14.4%, the ratio of those responding as “I have enrolled in more than one course but have completed only one course” was 6.4%, and finally the ratio of participants saying “I have enrolled in more than one course and completed more than one course” was 24.8%. This result can also be considered as an interesting one due to fact that one of the biggest issues discussed about MOOCs is low completion and high drop-out ratios. Gütl et.al. (2014), Christensen et.al., (2013), Ho et.al. (2014) reported the ratio of those completing the courses they enroll in at the MOOC platform as between 5 and 10 percent. It was observed that the percent of the participants who enrolled and completed one or more MOOCs is higher than the reported percentages in the literature although it is still lower than expected. One may infer this result as that more Turkish participant persist to complete MOOCs than the average. However, it is important to investigate the dropouts among the Turkish participants of MOOCs.

The completion ratio and the reasons behind dropouts have been an interest to several studies such as Balsh (2013), Gütl (2014), and Khalil (2014). These studies suggested that the main dropout reasons are lack of motivation, sense of isolation, shortage of communication and interaction, and participants’ perceptions regarding their shortage of skills about online learning and especially about technical matters. Gütl et.al. (2014) have classified the dropout reasons into four main categories: (1) personal, (2) academic, (3) support, and (4) learning environment related. As personal reasons, the research participants have expressed the change in working conditions at their workplaces, and the fact that their expectations have not been met in MOOCs. They also listed family and health problems among personal reasons for not being able to complete the MOOCs they enrolled. Meanwhile, Gütl et al (2014) classified the difficulty to work and study simultaneously, and difficulty of motivating themselves as the academic reasons for the dropout. With respect to the support services, the MOOC participants have, first of all, emphasized that they usually do not receive adequate support from course instructors/facilitators, their families, and employers. In addition, they expressed the lack of adequate and timely feedback as the reasons categorized as support. The last reason indicated in this category was shortage of technical skills to be able to actively complete the courses. On the other hand, as environmental factors, the MOOC participants have mentioned problems in access to the Internet, inability to establish communication with the other learners and the instructor(s)/facilitators, and lack of a personalized learning environment to meet their personal needs and learning processes.

The final research question of the study was about the participants’ preference of the topics they would like to study in Turkish MOOCs. As it was indicated in the methodology section, the participants were asked to answer

an open-ended question freely, and the responses analyzed qualitatively but later transformed into quantitative data. As a result, four categories have been identified. Table 3 provides these categories.

Table 3. Participants' preferences of the topics for MOOCs

Categories Course Topics	%	Gender	%	Age	%
Technical trainings	52	Female	36.7	17-24	50
		Male	63.3	25-32	25.5
				33-40	20.1
				41-49	2.2
				50 +	2.2
Open and distance learning	18	Female	51.7	17-24	53.5
		Male	48.3	25-32	16.3
				33-40	18.6
				41-49	4.6
				50 +	7
Social sciences	13	Female	52.2	17-24	41.9
		Male	47.8	25-32	22.6
				33-40	29
				41-49	
				50 +	6.5
Personal development and hobbies	17	Female	58.6	17-24	24
		Male	41.4	25-32	28
				33-40	32
				41-49	4
				50 +	12

As it is summarized in the Table 3, a big majority (52 percent) of the participants of the study prefers MOOCs on “Technical Training”. Especially, young males (between 17-24 years old) are very eager to improve their technical skills. Under this category, the participants mostly indicated courses on computer programming, such as Ruby Rails, Java, C-sharp, etc., mobile operating and programming systems, such as Android, IOS, etc., and some basic computer operating and advance application software, such as advance Excel, MySQL, etc. This is also contradicting result with the literature. Studies, such as Christensen et.al. (2013), indicates that the MOOCs preferred are generally in the field of social and human sciences. However, this can be considered as usual due to the fact that a big majority of the participants of the study was from the fields related to informatics for academia.

The surprising result was the second category. A significant number of participants stated topics related to “Open and Distance Learning”, such as theories of open and distance learning, mobile learning applications, designing online learning, etc. It was even more surprising that similar to technical training category those who noted the topics in this category were mostly in the youngest group. This might be interpreted that young generations value open and distance learning more, and try to learn how it happens. On the other hand, 13 percent of the participants have expressed interest in taking MOOCs related to “Social Sciences”. For instance, foreign languages, history, art, psychology, philosophy, sociology, anthropology, and literature are the most frequently written topics. The topics in the final category, “Personal Development and Hobbies”, were pointed out as much as the ones in open and distance learning category. The course topics vary a lot from garnishing to gardening, photography to childcare, personal care to gastronomy, home improvements to public speaking.

Moreover, Table 3 uncovers that there is a significant difference between females and males' preferences of the topics for MOOCs. Males are interested more in technical fields while the females are mostly in personal development and hobbies as well as topics in other categories. It can also be seen in Table 3 that younger participants mostly want technical training, open and distance learning, and social sciences while older ones prefer personal development and hobbies.

CONCLUSION AND RECOMMENDATIONS

The open and distance learning represent an approach that has emerged in order to find a solution to the diversified requirements of individuals in the social changes. New applications are added to the agenda with the support of developing technologies in order to be able to meet the increasing and changing requirements. MOOCs, attracts an increasing attention, are one of the innovations emerged in order to meet these requirements.

MOOCs are defined as online courses that ensure large-scale interactive participation and aim for open access through the Web, where individuals may enroll and follow up the content. The participants may enroll in these courses as based on their field of interest or requirements, create contents with the course/s they prefer and share these with other individuals, without any place and time limitations. While MOOCs offer opportunity to work and discuss with individuals from different regions of the world, in different age groups and cultures, they also are able to create life-long learning opportunities for students, adults, business people, and in general anyone who would like to improve her/his skills (Stracke, 2014). Therefore, MOOCs, bringing learners of different learning experiences and lives together in the same environment, allow them to assist in the personal developments of each other by discussing and sharing their opinions, experiences and knowledge and adding different perspectives. Meanwhile, this massive and open nature of the MOOCs support the enrichment of course contents (de Waard, 2013).

Although everyday millions of the individuals attend MOOCs, there are a lot of missing parts in the literature. For instance, experts agreed on that we have to study more who are these people taking MOOCs, what they prefer to study, why they come, why just a few complete and others not. In Turkey, on the other hand, the MOOCs movement is still in infancy stage and there are very few MOOCs in Turkish. Aydin (2015) claims that in order to offer more effective, efficient, engaging and enduring initiatives for opening up education, there is a need for analyzing the audience. This study was conducted to meet this need. In other words, the primary goal of this study is to explore the learners' willingness to participate MOOCs and their preferences of the topics for MOOCs. At the same time, the study provided a limited insight about the current status of Turkish higher education students, administrators, staff, and faculty regarding MOOCs' participation and completion.

This descriptive study was conducted with voluntarily participation of 211 students, staff, faculty and administrators who have joined the Informatics for Academia 2015 Conference organized by INETD and Anadolu University during 31 January – 6 February 2015 in Eskisehir. An online survey instrument, included both open- and close-ended questions, was shared with around 4000 conference and preconference workshops participants. However, only those 211 participants answered all the questions included in the survey and these used in the analysis.

Some of the results of the study supported the available literature while some uncovered contradicting points. First of all, the study has shown that quite a number of the participants have had MOOC experience. This was quite interesting because, as it has been mentioned before, the number of MOOCs in Turkish is very limited. It seems those young Turkish students, staff, and faculty often attend MOOCs in Coursera, EdX and other platforms. On the other hand, similar to the literature, those participants who had prior MOOC experience are mainly males, less than 30 years old, and already enrolled in a higher education institution. Since MOOCs require use of technology effectively, having younger generations in MOOCs is not surprising. Although age range of the participants does not really contradict, still MOOC participants in Turkey are still a bit younger than general audiences indicated in the literature, such as URL-3 (2014). Similarly, the completion ratio is a bit higher among those participants of the study who enrolled a MOOC. The literature reveals that the completion ratio is between 5 to 10 percent (Coutere, 2014; Christensen et. al., 2013; Glance, 2013; Gütl et. al., 2014; Ho et. al., 2014) in MOOCs but in this study it was found between 10 to 24 percent. This can be interpreted that the Turkish MOOC participants show more resistance to complete the online courses.

In terms of willingness to attend MOOCs in Turkish, a big majority showed great interest in these MOOCs. Also a great deal of the others indicated that the topics of MOOCs are an important factor for their decision. Only very few noted an unwillingness to take MOOCs in Turkish. In terms of participants' preferences of the MOOC topics, males preferred technical topics while females indicated MOOCs related to personal development and hobbies. According to the literature (e.g. Jacobs, 2013; Kirschner, 2012; Martin, 2012; Young, 2013), the number of the individuals who take to MOOCs for either entertainment or curiosity is higher than those who attend for improving their job related skills or who are looking for a new occupation. However, in Turkey, especially younger generations prefer courses that will help them get a certificate and finally a job. Having a decent and secure job is the major goal orientation of the students in undergraduate level. That might be an important factor why especially males prefer technology related MOOCs.

In order to be able to benefit from MOOCs, there is a need for further research in the field. Pedagogical models, business models, cultural differences, international multilingual MOOCs platforms, effective ways of using of open education resources in MOOCs, quality assurance, MOOC participants preferences on different aspects of MOOCs, including media choices, instructional and assessment strategies, as well as their behaviors in MOOCs are among the major research areas must be searched.

On the other hand, the findings have shown that individuals are willing to take MOOCs, especially if they are focusing on topics that they are interested in. So, the institutions should think of building new MOOCs platforms in Turkish or the available ones should consider transforming their platform in to a multilingual platform. It seems that MOOCs focusing on technological skills, personal development and hobbies will grab the attention of the Turkish individuals.

LIMITATIONS OF THE STUDY

Although it provides an insight about the MOOCs participants in Turkey, the study had some limitations. First of all, the study is limited to the participants of an academic conference that focuses on information and communication technologies in academia. Conducting the study with a group whose majority is young and tech-savvy might influence the results related to technology-based learning, MOOCs. More research in different contexts and with various participants might help to get a better insight. Additionally, the number of responses might have an effect on the results. A more appropriate number of responses, such as more than 360 as indicated by Creswell (2012) also increase the reliability of the results.

REFERENCES

- Alcorn, B., Christensen, G., Steinmetz, A., Bennett A., Woods, D., & Emanuel, E.J. (2013). The MOOC phenomenon: Who takes massive open online courses and why? Working Paper. University of Pennsylvania. Retrieved from: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2350964
- Agarwal, P. K., Bain, P. M., & Chamberlain, R. W. (2012). The value of applied research: Retrieval practice improves classroom learning and recommendations from a teacher, a principal, and a scientist. *Educational Psychology Review*, 24(3), 437–448. <http://dx.doi.org/10.1007/s10648-012-9210-2>.
- Aydin, C.H. (2015). Status of OER & MOOCs in Turkey. Paper presented at International Educational Technologies Conference 2015. İstanbul, Turkey.
- Balch, T. (2013). MOOC student demographics (Spring 2013). Retrieved September 26, 2013, from <http://augmentedtrader.wordpress.com/2013/01/27/mooc-student-demographics/>
- Barber, M., Donnelly, K., & Rizvi, S. (2013). An Avalanche is Coming: Higher education and the revolution ahead. http://www.ippr.org/images/media/files/publication/2013/04/avalanche-is-coming_Mar2013_10432.pdf
- Belanger, Y., & Thornton, J., (2013). Bioelectricity: a quantitative approach. Duke University's first MOOC. (pp. 1–21). http://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/6216/Duke_Bioelectricity_MOOC_Fall2012.pdf
- Breslow, L., Pritchard, D. E., DeBoer, J., Stump, G. S., Ho, A. D., & Seaton, D. (2013). Studying learning in the worldwide classroom: Research into edX's first mooc. *Research & Practice in Assessment*, 8, 13-25.
- Coutere, B.D. (2014). To MOOC or not to MOOC. *Training Journal*, January 2014, 18-22.
- Davis, B., & Sumara, D. (2010). "If things were simple...": complexity in education. *Journal of Evaluation in Clinical Practice*, 16(4), 856–860.
- Daniel, J. (2012). Making sense of MOOCs: Musings in a maze of myth, paradox and possibility. *Journal of Interactive Media in Education*, 3. Retrieved from <http://www-jime.open.ac.uk/jime/article/viewArticle/2012-18/html>
- Downes, S. (2008). Places to go: connectivism & connective knowledge. *Innovate*, 5(1). Retrieved from: <http://www.innovateonline.info/index.php?view=article&id=668>
- Geabel, M. (2013). MOOCs: Massive Open Online courses. Belgium, Brussels: EUA Occasional Papers.
- Glance, D. (2013). The teaching and learning foundations of MOOCs. Url: <http://theconversation.com/the-teaching-and-learning-foundations-of-moocs-14644> (Erişim tarihi: 19 Mayıs 2014).
- Gütl, C., Rizzardini, R., H., R., Chang, V., & Morales, M., (2014) Attrition in MOOC: Lessons Learned from Drop-Out. *Communications in Computer and Information Science Volume 446, 2014, pp 37-48*.
- Herman, R. (2012). The MOOCs are coming. *The Journal of Effective Teaching*, 12(2), 1-3.
- Ho, A.D., Reich, J., Nesterko, S. O., Seaton, D. T., Mullaney, T., Waldo, J., & Chuang, L. (2014). HarvardX and MITx: The first year of open online courses, fall 2012-summer 2013. HarvardX and MITx Working Paper. SSRN Working Paper. Doi: <http://dx.doi.org/10.2139/ssrn.2381263>
- Hollands, F.M., & Tirthali, D. Center for Benefit-Cost Studies of Education Teachers College, Columbia University MOOCs: Expectations and Reality Full Report May 2014
- Khalil, H & Ebner, M. (2013). "How satisfied are you with your MOOC?" – A research Study on Interaction in Huge Online Courses In *proceedings of the World Conference on Educational Multimedia, Hypermedia and Telecommunications 2013*, 830- 839.
- Kirschner, A. (2012, October 1). A pioneer in online education tries a MOOC. *The Chronicle of Higher Education*. Retrieved from <http://chronicle.com/article/A-Pioneer-in-Online-Education/134662/>

- Krause, S.D. & Lowe, C. (2014). *Invasion of the MOOCs: The Promise and Perils of Massive Open Online Courses*. USA, SC: Anderson.
- Koutropoulos, A., Gallagher, M. S., Abajian, S. C., de Waard, I., Hogue, R. J., Keskin, N. Ö., & Rodriguez, C. O. (2012). Emotive vocabulary in MOOCs: Context & participant retention. *European Journal of Open, Distance, and E-Learning*. Retrieved from <http://www.eurodl.org/index.php?p&article=507>
- Levy, D. (2011). *Lessons Learned from Participating in a Connectivist Massive Online Open Course*. Paper presented at the Emerging Technologies for Online Learning Symposium (ET4Online), the Sloan Consortium, San Jose, CA.
- Mackness, J., Mak, S. and Williams, R. (2010). The ideals and reality of participating in a MOOC. In: *Proceedings of the 7th International Conference on Networked Learning 2010*. University of Lancaster, Lancaster, pp. 266-275. ISBN 9781862202252
- Martin, F. G. (2012). Will massive open online courses change how we teach? *Communications of the ACM*, 55(8), 26-28. doi: 10.1145/2240236.2240246
- Peters, M. (2013) *Massive Open Online Courses and Beyond: the Revolution to Come* Truthout, August 17
- Siemens, G. (2012). *MOOCs are really a platform* . Retrieved from <http://www.elearnspace.org/blog/2012/07/25/moocs-are-really-a-platform>
- Stracke, C.M. (2014). How can e-learning and MOOCs reveal and exploit the hidden treasures of open research and open education? In A.M. Teixeira, A. Szűcs, & Mázár, I. (Eds.),
- Stevens, V. (2013). What's with the MOOCs? *The Electronic Journal for English as a SecondLanguage*. 16(4).
- Swan, K., Bogle, L., Day, S., & Matthews, D. (2014). *Assessing Massive Open Online Course pedagogy (AMP)*. Paper presented at the 2014 Annual Conference of the American Educational Research Association, Philadelphia, PA.
- Young, J. R. (2012). Providers of free MOOC's now charge employers for access to student data. *Chronicle of Higher Education* (4 December), at <http://chronicle.com/article/Providers-of-Free-MOOCs-Now/136117/>. (Erişim tarihi 20 Mayıs 2014)
- Young, J. R. (2013). *Beyond the MOOC hype: A guide to higher education's high-tech disruption*. Washington, DC: The Chronicle of Higher Education.
- Wang, Y. Baker, R. (2015) *Content or Platform: Why do students complete MOOCs?* *MERLOT Journal of Online Learning and Teaching*, 11 (1), 17-30.[pdf]

Pre-Service Teachers' Perceptions of ICT Integration in Teacher Education in Turkey

Aydm Aslan

*Department of Educational Sciences, Vrije Universiteit Brussel, Belgium
aaslan@vub.ac.be*

Chang Zhu

*Department of Educational Sciences, Vrije Universiteit Brussel, Belgium
chanzhu@vub.ac.be*

ABSTRACT

Information and Communication Technology (ICT) integration in teacher education and teaching practices of teachers is a complicated and challenging issue. As far as pre-service teachers are concerned, this becomes critical because they need to be equipped with the competencies for their future teaching practices. The objective of this study is to identify pre-service teachers' perceptions of ICT integration in teacher education and its association with their teaching practices. A stratified two-stage probability sampling design was used. Firstly, three Turkish state universities with the highest and lowest number of the pre-service teachers were chosen. Secondly, pre-service teachers from the subject domains of Turkish language, social sciences, elementary education mathematics and science were selected. A qualitative method was used in this study. Data were collected from 782 pre-service teachers from open ended questions in a survey and interviews were conducted with 15 participants. Qualitative data were analyzed with thematic coding. The results identified the specific conditions of ICT integration in teacher education and pre-service teachers' perceptions of ICT integration and the associations with their teaching practices.

Keywords: pre-service teachers, ICT integration, ICT competency.

INTRODUCTION

Information and Communication Technology (ICT) appear to be not only the backbone of the Information Society, but also a crucial catalyst and tool to bring about educational reforms which enable our students to be productive knowledge workers (Pelgrum, 2001). In this context, ICT seems to be an important tool to support new ways of teaching and learning (Drent & Melissen, 2008). The integration of ICT into education remains a crucial issue for both teachers and students to perform effectively. Therefore, teachers are required to be competent in the use of ICT (Voogt & Roblin, 2012; Pineida, 2011).

An important factor for teachers to integrate technology into instruction is being trained in how to integrate technology into education (Pamuk & Peker, 2009). In this regard, teacher education programs play a significant role in training pre-service teachers to integrate ICT into education. The programs should enable them to gain technology rich experiences throughout all aspects of training (UNESCO, 2008). What is more, pre-service teachers should acquire the skills and knowledge essential for ICT use in their pre-service learning process and apply them in their pre-service education period and in their professional life (Yapıcı & Hevedanlı, 2012). So, pre-service teachers' perceptions of ICT integration in teacher education are highly important to investigate whether the programs for teacher education are sufficient to prepare pre-service teachers to acquire and integrate ICT competence in their pre-service education and in their prospective life.

THEORETICAL BACKGROUND

ICT integration in teacher education and teaching practices of teachers is a complex and challenging issue. In this regard, Gülbahar and Güven (2008) claim that just equipping schools with the essential ICT tools does not improve the quality of instruction and does not create more effective learning environments. Nevertheless, schools should reconsider the current teaching programs, practices and resources by grasping a broader vision and philosophy. It is not simple to integrate technology successfully since it relies on interlinking variables (Akbaba-Altun, 2006). In this study, the interlinking variables, namely variables related to ICT integration in education, are examined focusing on three categories related to pre-service teachers' ICT integration into teaching practices. These categories are conditions for ICT integration in education, pre-service teachers' perceptions of ICT integration and the perceived impact of pre-service teachers' perceptions on their practices of ICT integration in education.

Conditions for ICT integration in education

Infrastructure is one of the crucial variables to integrate ICT into education. It is indicated in many studies (Akbaşı-Altun, 2006; Akbulut, Odabaşı & Kuzu, 2011; Göktaş, Yıldırım & Yıldırım, 2008; Pelgrum, 2001; Voogt, Knezek, Cox, Knezek & Ten Brummelhuis, 2011) that infrastructure is highly important to integrate ICT in education successfully. In this regard, Akbulut, Odabaşı and Kuzu (2011) claim that strong infrastructure should be ensured in addition to providing equal access for all, taking precautions to facilitate ease of use and employing technical staff to help users. The development of ICT integration infrastructure is understood to be one of the domains to integrate ICT into education.

In the context with the ICT courses in teacher education, pre-service teachers are trained with Computer I and II, Instructional Technology and Material Development (ITMD) courses in Turkey. The general objectives of the “Computer I” course are to enable pre-service teachers to learn ICT, the basic concepts in regards to hardware and software, operating systems in general, word processor, spreadsheet, presentation program, usage of Internet in education. The course consists of four hours per a week, namely two hours for theory and two hours for practice. In addition to the “Computer I” course, the general objectives of the “Computer II” course are to enable pre-service teachers to be knowledgeable about basic concepts, elements, theoretical basis, advantages, limitations and application methods with regard to computer assisted education. The course consists of four hours per a week, namely two hours for theory and two hours for practice. It is understood from the objectives of Computer I and II courses that pre-service teachers are expected to be literate in technology. The main objectives of the ITMD course are to learn the usage of instructional technologies in education, to plan and apply instructional technologies in education, to develop two and three dimensional materials using instructional technologies, to examine educational software and to assess a variety of instructional technologies. The ITMD course consists of four hours per a week, namely two hours for theory and two hours for practice (HEC, 2006). Pre-service teachers are required to acquire the competency to use the existing technology in teaching-learning process through the ITMD course (Gündüz & Odabaşı, 2004).

Factors related to ICT integration (as perceived by pre-service teachers)

The pre-service teachers’ perceptions regarding ICT integration are examined in terms of staff issue and teacher related variables. According to Pelgrum (2001), insufficient supervision staff, and lack of technical assistance are among the most common obstacles for ICT implementation. Therefore, the pre-service teachers’ views concerning staff issue in respect to ICT integration are examined in this study. As a result of the literature review, it appears that teacher related variables are also important predictors for technology integration. According to Becker (2000), teachers’ limited skill and expertise in using computers is an obstacle for more teachers to utilize computers frequently with their students. Besides, teachers’ attitude to technology affects computer supported education to a large extent (Celik & Yesilyurt, 2013). According to Pamuk and Peker (2009), computer anxiety will also prevent those teachers who suffer from computer anxiety from using educational technology effectively. Moreover, Aslan and Zhu (2014) found out that pre-service teachers’ pedagogical knowledge, their gains from ICT related courses in their teaching program and their perceived ICT competence significantly predict their ICT integration into teaching practice. In addition, more experience also brings about a more positive attitude towards computers (Beckers & Schmidt, 2003). Therefore, teacher related variables concerning ICT integration in education were investigated further in this study.

The association between pre-service teachers’ perceptions of ICT integration and their teaching practices (as perceived by pre-service teachers)

In many studies (Teo, 2009; Yücel, Acun, Tarman & Mete, 2010; Aslan & Zhu, 2014), teachers’ perceptions for ICT integration such as their ICT self-efficacy, technology attitudes, computer anxieties etc. are investigated to predict to what extent teachers integrate ICT into their teaching practices. In this study, the perceived impact of pre-service teachers’ perceptions concerning ICT integration in education on their practices was investigated. The rationale behind this idea was to see the link between their perceptions and practices for ICT integration in education. The link is believed to give an important insight to understand pre-service teachers’ ICT integration on their teaching practices holistically.

Objectives of the study

As a result of the literature review, it shows that the number of the studies dealing with pre-service teachers’ perceptions with regard to ICT integration in teacher education and its associations with their teaching practices is very limited. Therefore, the objectives of this study are to understand Turkish pre-service teachers’ perceptions concerning the conditions for the infrastructure for ICT integration and the integration of ICT courses in teacher education, their perceptions for ICT integration, their views with regard to the effective integration of ICT in education and the perceived impact of pre-service teachers’ perceptions concerning ICT integration in education on their teaching practices.

Research questions

This study focused on the following research questions.

1. What are Turkish pre-service teachers' perceptions concerning the conditions for the integration of ICT in education in terms of infrastructure for ICT integration?
2. What are pre-service teachers' perceptions concerning the conditions for the integration of ICT in education in terms of the integration of ICT courses in teacher education?
3. What are pre-service teachers' perceptions regarding ICT integration in education?
4. What are pre-service teachers' views regarding effective integration of ICT in education?
5. What is the perceived impact of pre-service teachers' perceptions concerning ICT integration in education on their practices?

METHOD

A qualitative method was used in this study to investigate pre-service teachers' perceptions of ICT integration in education in Turkey. A total of 782 pre-service teachers answered a survey with open ended questions and 15 pre-service teachers were interviewed.

Participants

A stratified two-stage probability sampling design was used. Firstly, three Turkish state universities with the highest and lowest number of the pre-service teachers were chosen. Secondly, pre-service teachers from the subject domains of Turkish language, social sciences, elementary education mathematics and science were selected. Student Selection and Placement Center's 2012 quota was taken into account to determine the population size (ÖSYM, 2012).

The qualitative study consists of the two sections. The first section composes of the open ended questions in a survey involving 782 pre-service teachers studying in Turkish teaching, Social Sciences teaching, Science teaching and elementary education mathematics teaching in their fourth year level of education at Aksaray, Gazi, Marmara, Dokuz Eylül, Niğde and Fırat Universities in the spring semester in 2014 in Turkey. The second part involves interviews with 15 pre-service teachers (nine female and six male) in the same period in Turkey.

Procedure

A questionnaire with open ended questions was sent to 782 pre-service teachers at six different universities in four different subjects in the spring semester in Turkey in 2014 to investigate their perceived ICT competences and their integration of ICT into teaching practices. Informed consent was obtained from all the universities and participants to conduct the study. The questions included the following elements: the pre-service teachers' perceptions of conditions for ICT integration, integration of ICT courses in teacher educations, and their perceptions regarding ICT integration into education. The open ended questions are provided in Appendix I.

Interviews were conducted with 15 pre-service teachers studying in Turkish teaching, Social Sciences teaching, Science teaching and elementary education mathematics teaching in their fourth year level of education at Aksaray, Niğde and Dokuz Eylül Universities. The interview questions were semi-structured. The interview questions aimed to understand pre-service teachers' thoughts regarding the link between their perceptions and their teaching practices. The interview questions are given in Appendix II.

Both the open ended and interview questions were developed by the researcher together with an expert in educational sciences based on a review of the related literature (Alev 2003, Gökteş 2006). The questions were evaluated in terms of content validity by two experts in the field of educational sciences. All interviews were conducted individually. Each interview lasted for about 10-15 minutes. Additional questions sometimes were asked to clarify the issues in their experiences to use ICT in their teaching practices. The participants gave consent to audio record the interviews.

Coding and analysis

The participants' responses to the open ended questions were transcribed and each case was assigned a case number. All interviews were transcribed and entered into QSR NVivo 8.0 for analysis.

Qualitative data analysis was used to analyze the responses given to the open ended questions and the interviews. Thematic coding was used to analyze the data. The unit of analysis was based on units of meaning. Open coding was used to ascertain the themes and axial coding was applied to connect the sub-themes under the related themes. Three major themes emerged from open coding, namely "conditions for ICT integration in education", "pre-service teachers' perceptions of ICT integration", and "the perceived impact of pre-service teachers'

perceptions concerning ICT integration in education on their practices”. The sub-themes related to each major theme and the frequencies of the themes and sub-themes are presented in Appendix III.

The first author and two other independent researchers did the coding of all data and constructed the main themes and sub-themes. The results of the three researchers were compared. Cohen’s Kappa coefficients were calculated for the interrater reliability. The results of the reliability are shown in Table 1. The interrater reliability for the themes and sub-themes varied from 0.615 to 1.00. The reliability results show that the coding procedure was reliable. For those sub-themes that had a lower reliability, discussions were conducted among the researchers in order to reach a consensus.

Table 1. Cohen’s Kappa coefficients for the interview and open ended questions

1.A.1. Infrast. for ICT int.	1.A.2. ICT sources	1.A.3. Access to ICT	1.B) Integration of ICT courses
K2	K2	K2	K2
+	+	+	+
-	-	-	-
Σ	Σ	Σ	Σ
K1	K1	K1	K1
+	+	+	+
-	-	-	-
Σ	Σ	Σ	Σ
Kappa: .667	Kappa: .750	Kappa: .690	Kappa: .800
p: .083	p: .028	p: .000	p: .010
2. Computer I & II	3. Instructional technologies and...	1. Available Personnel	2. Perceived importance of..
K2	K2	K2	K2
+	+	+	+
-	-	-	-
Σ	Σ	Σ	Σ
K1	K1	K1	K1
+	+	+	+
-	-	-	-
Σ	Σ	Σ	Σ
Kappa: .732	Kappa: .723	Kappa: 1,00	Kappa: .732
p: .005	p: .001	p: .083	p: .005
3. Perceived importance of ICT	5. Pre-serv. teachers’ barriers...	6.1.Pre-servive teaches’ attitude to ICT	7. Perceived role of ICT in teaching
K2	K2	K2	K2
+	+	+	+
-	-	-	-
Σ	Σ	Σ	Σ
K1	K1	K1	K1
+	+	+	+
-	-	-	-
Σ	Σ	Σ	Σ
Kappa: .800	Kappa: 1.00	Kappa: .648	Kappa: 1.00
p: .010	p: .083	p: .000	p: .046
8.Pre-service teach. prior experience.	9. Pre-service teachers’ ICT anxiety	10. Interest to learn ICT skills	11. Teachers’ roles and responsibilities
K2	K2	K2	K2
+	+	+	+
-	-	-	-
Σ	Σ	Σ	Σ
K1	K1	K1	K1
+	+	+	+
-	-	-	-
Σ	Σ	Σ	Σ
Kappa: 1.00	Kappa: .643	Kappa: .800	Kappa: .667
p: .008	p: .008	p: .010	p: .083
11.2. Teachers’ responsibilities	3.The perceived impact of pre-service teachers’ practices		
K2	K2		
+	+		
-	-		
Σ	Σ		
K1	K1		
+	+		
-	-		
Σ	Σ		

+	2	0	2	+	4	0	4
-	1	2	3	-	1	4	5
Σ	3	2	5	Σ	5	4	9
Kappa: .615	p: .136	Kappa: .780	p: .016				

RESULTS

As a result of the open coding of the participants' responses concerning the open ended questions and the interview transcripts, three major themes emerged. They are "conditions for ICT integration in education", "pre-service teachers' perceptions of ICT integration" and "the perceived impact of pre-service teachers' perceptions concerning ICT integration in education on their practices". In this section, the themes and their sub-themes were explained in detail. The descriptions were supported with direct quotations from the participants.

Conditions for ICT integration in education

Infrastructure

As a result of axial coding, "Infrastructure" was identified as one of main themes related to conditions for ICT integration in education. Related to "Infrastructure" three sub-themes were identified, namely "infrastructure for ICT integration", "ICT resources" and "access to ICT".

The sub-theme "infrastructure for ICT integration" consisted of three sub-components, namely "overcrowded classes", "physical settings" and "power failure". Among 71 participants in the survey, 30 participants stated that their classes were overcrowded. For example, one female participant (number 45th from the survey) said that *"Each student should be allocated a personal computer. Classroom size should be arranged in a way that students take their lessons in groups"*. As for the physical setting, 38 participants said that the physical setting (e.g. building and classroom) should be reorganized taken into account ICT such as audio and visual aspects. Besides, three participants indicated that they had difficulty in using ICT due to power failures.

The sub-theme "ICT resources" consisted of three elements, namely "software", "hardware" and "ICT labs". Out of 120 participants in the survey and interview, 11 respondents commented that appropriate software programs should be made available for their courses. For example, one female participant (number 263th from the survey) indicated that *"Games and animations complying with the needs of the courses should be developed"*. Besides, 102 participants indicated that hardware resources (e.g. computers, projectors etc.) should be increased for the integration of ICT in their teaching practices. Moreover, seven participants out of the 15 interviews pointed out that the number of ICT laboratories should be increased as well.

The sub-theme "access to ICT resources" is referred to the level of access to ICT resources. Among 190 participants in the survey, 53 participants stated that they had difficulty in accessing to ICT resources at their universities, 137 participants did not encounter any problem regarding access to ICT resources at their universities. Out of 189 participants in the survey, they accessed to ICT resources through computer laboratories (n=67), ICT courses (n=55), library (n=30), personal computer (n=17), internet (n=13), wifi in campus (n=5) and residences (n=2).

Integration of ICT courses in teacher education

The sub-theme "integration of ICT courses in teacher education" was identified as one of the components of "Conditions for ICT integration in education". With regard to "integration of ICT courses in teacher education", three elements were identified, namely "ICT integration", "Computer I and II" and "Instructional technologies and material development".

With regard to the course "ICT integration", among 49 participants in the survey and interview, 23 participants pointed out that the ICT course hours should be increased. For example, a female participant (number 50th from the survey) stated that *"The course hours are limited and the curriculum is heavy and the course hours should be increased..."* Four participants from the interviews stated that ICT courses should be extended throughout the program. Another female participant (number 39th from the survey) stressed that the ICT courses should be given starting from the first year. Five participants (three in the survey and two in the interview) mentioned that ICT training should be given considering the subject area. For example, a male participant (number 44th from the survey) said that *"...the integration of ICT into the content knowledge has to be increased."* and a female participant (number 44th from the survey) stated that *"...the ICT courses do not include the knowledge concerning science and technology teaching."* In parallel with this sub-component, six participants from survey indicated that ICT should be integrated into their courses.

The participants' perceptions concerning the sub-theme "Computer I and II" courses were examined in regards to their sufficiency to equip them to with ICT competency. Among 180 participants in the survey and interviews, 81 participants perceived the courses sufficient, and 91 participants found them insufficient. Meanwhile, eight participants' perceptions concerning the courses were somewhat sufficient. For example, a female participant (number 85th from the survey) mentioned that *"These courses are actually sufficient in terms of their content...through the right plan and program; they develop our ICT skills..."* However, a female participant (number 124th from the survey) said that *"In my opinion, Computer I and II courses should have focused on up-to-date programs. For example, for our subject teaching, a course called "Turkish in Computer Use" could have been given. In the context with the course, how an e-mail is written on computer can be taught..."* and a female participant (number 171th from the survey) stated that *"When I compare my ICT knowledge before and after the courses, they did not have an effect on my knowledge"*. Among 57 participants, 13 participants demanded that the courses should be given in more detail and 44 participants stressed that more practice should be conducted in these courses.

The participants' perceptions in regards to the sub-theme "Instructional technologies and material development" course were investigated whether it was sufficient for the participants to acquire the competency to integrate ICT in their teaching practices. Among 138 participants in the survey and interviews, 79 participants cited that the course was sufficient. For example, a female participant (number 342th from the survey) stated that *"I developed my skill to prepare presentations considerably. I even prepared software for educational purpose."* Whereas 7 participants perceived the course somewhat sufficient, 52 participants perceived it insufficient. 76 participants made some suggestions to make the course more effective. Those suggestions can be grouped under the four elements, namely more detailed, more practice, more emphasis on instructional technologies and using smart boards in education. Six participants demanded that the courses should be arranged in detail. Besides, 17 participants emphasized that they should make more practice in the course. On the other hand, 39 participants stressed out that they focused on the material development rather than instructional technologies in the course and they demanded that more emphasis should be allocated to the instructional technologies. For example, a male participant (number 83rd from the survey) said that *"we did not develop anything in technology but something in material."* And lastly, 14 participants stated that they should use smart boards in their teaching training. For example, a female participant (number 476th from the survey) stressed that *"...teachers should be trained how to use smart boards in education."*

Factors related to ICT integration (as perceived by pre-service teachers)

The theme "pre-service teachers' perceptions of ICT integration" deals with ICT integration into education with regards to staff issue and teacher related variables. The theme consists of several sub-themes.

Available personnel

With regard to "available personnel" sub-theme, the personnel issue was examined in terms of academic members and technical assistants. Out of 26 participants in the survey and interviews, 22 participants emphasized that academic members should be more competent to use ICT in their teachings. For example, a female participant (number 83rd from the survey) cited that *"More competent academic members in instructional technologies should give lessons..."* Four participants demanded that technical support should be available when they need some help in their use of ICT.

Perceived importance of ICT integration in education

The sub-theme "perceived importance of ICT integration", consisted of six elements. Among 14 participants in the survey, the participants stated that enabling to gain positive attitudes to ICT (n=4), encouraging using ICT (n=3), arousing interest for ICT integration (n=2), increasing motivation to use ICT (n=2), overcoming the prejudice against ICT (n=2) and being aware of using ICT (n=1) are important to integrate ICT into education.

Perceived importance of ICT competence for ICT integration

The sub-theme "perceived importance of ICT competence for ICT integration" examines the relationship between ICT competence and pedagogical knowledge for ICT integration. Among 132 participants in the survey and interviews, four participants cited that just having ICT competence is adequate for ICT integration. On the other hand, the majority of the participants (n=114) indicated that in addition to having ICT competence, pedagogical knowledge is necessary to integrate ICT into education. For example, a female participant (number 62th from the survey) stated that *"Just having ICT competence is not sufficient because auto parts constitute a good car. A driver drives it. A car is nothing apart from an ornament unless it is used."* and a female participant (number 62th from the survey) cited that *"it is not sufficient to have ICT competence...pedagogical knowledge and content knowledge are also necessary."* and a female participant (number 100th from the survey) stressed that *"if just ICT competences would be adequate, we would not study in education faculties. An engineer would*

also teach. Teaching as a profession is to teach by touching humans' soul." In this context, five participants stated that having ICT competence and pedagogical knowledge complement each other regarding ICT integration into education. Six participants indicated that pedagogical knowledge is a prerequisite for ICT integration. For example, a male participant (number 6th interview) stressed that *"...pedagogical knowledge should be a pre-requisite for ICT integration. How does child development occur? What do children learn under different circumstances...?"* What is more, three participants emphasized that pedagogical knowledge is absolutely necessary for the integration of ICT into education.

Perceived barriers for integration of ICT in education

The sub-theme "perceived barriers for integration of ICT in education" consisted of two elements, namely "lack of experience" and "lack of ICT skills". Among 26 participants in the survey, 14 participants cited that their lack of experience makes it difficult to integrate ICT into education. For example, a male participant (number 347th from the survey) stated that *"I have difficulty in planning and teaching lessons. I think I have to be more experienced."* 12 participants indicated that they encounter barriers for their integration of ICT into education on account of not having ICT skills. For example, a female participant (number 261th from the survey) stated that *"...I am not skilled to use the programs in preparing or presenting lessons."*

Pre-service teachers' attitude to ICT

The sub-theme "perceived attitude to ICT" consisted of several elements. One of them is "investment in ICT". Among 15 participants in the interviews, 12 participants cited that in order to integrate ICT into education, it is necessary to make investment in ICT. However, one participant stated that it is not necessary to do so. Besides, one participant indicated that how the investment in ICT with regards to its integration into education made is more important than how much the investment is made. For example, a female participant (number 12th interview) stated that *"...it is more important to make the investments in ICT in education effectively. For instance, there is electricity matter in rural areas, villages. Unless this matter is overcome, it will be no use distributing computers, tablets to schools..."* On the other hand, a female participant pointed out that she is anxious for her subject teaching in regards to the investment in the integration of ICT in education. For example, a female participant (number 15th interview) stressed that *"...smart boards can have a negative impact on written expression..."* The other elements regarding the perceived attitudes to ICT out of 54 participants in the survey and interviews as follow: it is necessary (n=10), useful (n=10), economic (n=2), effective (n=3). It facilitates teaching (n=1), makes learning permanent (n=9) and abstract issues concrete (n=3), saves time (n=6), supports learning and understanding additionally (n=1), contributes to diversity (n=3), lifelong learning (n=1), multiple intelligence (n=3). It is preferred in teaching (n=2).

Perceived role of ICT in teaching and learning process

With regards to the sub-theme "perceived role of ICT in teaching and learning process", among 15 participants in the interviews, three participants stated that ICT will change teaching and learning process to some extent and six participants stressed that ICT will change teaching and learning process definitely and five participants cited that ICT will facilitate teaching and learning process.

Pre-service teachers' prior experience concerning ICT use

The sub-theme "pre-service teachers' prior experience concerning ICT use" consisted of three elements, namely "positive effect", "necessary" and "insufficient". Among seven participants in the survey, four participants cited that their prior experience in regards to their ICT use has positive effect on their integration of ICT into their teaching practices. In this respect, two participants indicated that it is necessary to learn ICT before studying at university. A female participant pointed out that her prior experience for ICT use was insufficient for her integration of ICT into education.

Pre-service teachers' ICT anxiety

The sub-theme "perceived ICT anxiety" out of 15 interviews consisted of eight elements, namely difficulty in learning ICT (n=1), process of preparing lesson (n=1), taking time (n=1), communication problem among students (n=1), using constantly causes monotony (n=2), teachers' being of the second importance (n=2), giving more importance to ICT (n=1) and misusing ICT (n=1).

Interest to learn ICT skills and knowledge

The sub-theme "interest to learn ICT skills and knowledge" out of 15 interviews investigates why the participants are interested in learning ICT skills and knowledge. The sub-theme consisted of five elements, namely work oriented (n=2), to some extent (n=2), like (n=1), obligation (n=2), certainly (n=5).

Teachers' roles and responsibilities concerning the use of ICT

The sub-theme “teachers’ roles and responsibilities concerning the use of ICT” out of 15 interviews examines teachers’ roles and responsibilities with regards to the use of ICT. Nine participants pointed out teachers’ roles with regards to ICT will decrease. In this regard, one participant stated that there will be no change in teachers’ role. As for teachers’ responsibilities regarding ICT, seven participants cited that their responsibilities will increase whereas seven participants stated that their responsibilities will decrease.

The association between pre-service teachers’ perceptions of ICT integration and their teaching practices (as perceived by pre-service teachers)

The last theme “the perceived impact of pre-service teachers’ perceptions concerning ICT integration in education on their practices” consisted of four elements, namely presentation, basic level, facilitating teaching and changing teaching approach. Out of the 15 interviews, eight participants indicated that they use ICT to present their subjects. Only one participant cited that they use ICT to facilitate teaching. For example, a female participant (number 5th interview) stated that “...we are now going to schools to teach practices. I think that ICT is our biggest support in teaching. It supports us in every respect. It makes students join lessons.” Besides, two participants stated that they use ICT in their teaching practices with a basic level. What is more, two participants emphasized that ICT has changed their teaching approach. For example, a male participant (number 1st interview) said that “...through the Internet, we were searching how to teach a subject more simply, easier and effectively. In the end, we were preparing a presentation. In consequence of these experiences, a number of my friends changed their ideas to use ICT in their teachings...”

DISCUSSION AND CONCLUSION

As a result of the qualitative data analysis for the pre-service teachers’ perceptions with regard to ICT integration into education, three major themes emerged from open coding, namely “conditions for ICT integration in education”, “pre-service teachers’ perceptions of ICT integration”, and “the perceived impact of pre-service teachers’ perceptions concerning ICT integration in education on their practices”.

The findings of this study indicate that classroom sizes should be small for pre-service teachers to acquire ICT skills and use it in education. Besides, the physical conditions of classrooms and buildings such as audio and visual aspects should be enhanced for ICT integration. In this context, power failures could be prevented. It is understood that there are differences among the universities in terms of ICT infrastructure. While some participants can have access to ICT sources at their universities without encountering any problem, the others have difficulty in accessing to the sources. Infrastructure policies and programs should deal with inequities in the distribution of ICT sources (Kozma, 2008). The differences among the universities can be overcome by increasing the quantity and quality of the hardware, software and ICT labs at the universities. According to Kay (2006), it is critical to provide software, hardware and support. But other strategies are needed to use technology in a meaningful and effective manner. Therefore, it should be ensured that every pre-service teacher should have access to the ICT sources without any difficulty.

The findings of this study suggest that some changes for ICT courses including increasing the course hours, extending the courses throughout the program and integration of the content knowledge into the courses should be made. While more participants perceived Computer I and II courses insufficient, more participants perceived “Instructional technologies and material development” course (ITMD) sufficient. These results show parallelism with the study by Aslan and Zhu (2014). The authors found out that the ICT courses were moderately effective. In this context, the participants made some suggestions for the effective integration of the ICT courses in education. For Computer I and II courses, participants demanded that the courses should be given in more detail and more practice should be applied in the courses. With regard to ITMD, participants suggested that the course should be provided in a more detailed way; more practice should be ensured in the course, more emphasis should be allocated to instructional technologies rather than material development and smart board should be used in education. Akbulut, Odabaşı and Kuzu (2011) found out that teacher training programs were insufficient to facilitate the effective integration of ICT and use of ICTs for instructional purposes. In this regard, Bozdoğan and Özen (2014) report that pre-service teachers should observe best practices of technology use and make practices with technology to facilitate learning, and have hands-on experiences with technology in their pre-service teacher education. It is inferred from the explanations that pre-service teachers should be given more opportunities to use ICT in their courses to be a competent user in ICT integration in education.

Another finding of this study is related to the available personnel. Participants stated that academic members should be more competent to integrate ICT into their teaching practices. This issue is very important in the sense that their competency in ICT influences their designing, planning and teaching their courses. For instance, it is understood from the participants’ responses in the context with ITMD course that less competent academic

members in ICT focus on more material development rather than instructional technologies. This is confirmed by Yücel et al. (2010). The authors point out that ICT training should be given by trainers who are competent in teaching technology and curriculum needs. Besides, participants demanded that technical support should be available when they need it.

The study indicates that the participants perceive ICT important in their teaching processes. In this regard, they have a positive attitude to the integration of ICT into education. So, it is significant for pre-service teachers to have positive attitude to ICT. The study also shows that prior experience concerning ICT use has a positive contribution on their integration of ICT in education.

It also appears that participants encounter barriers in integrating ICT due to lack of experience and lack of ICT skills. If the barriers stemming from lack of experience and ICT skills are minimized, they can use ICT in their teaching practices more often.

Our study shows that some participants are anxious for ICT usage because of difficulty in learning ICT, process of preparing lesson, taking time, communication problem among students, using constantly causes monotony, teachers' being of the second importance, giving more importance to ICT, and misusing ICT. A number of teachers suffer from computer anxiety and this will prevent those teachers from using educational technologies effectively (Pamuk & Peker, 2009). In this regard, it is crucial for the participants to overcome their anxiety for ICT use. It can be suggested that more practice and experience with a variety of ICT sources in using ICT in teaching will reduce their anxiety for ICT use in education.

It indicates that participants learn ICT skills and knowledge because of work oriented, liking, and obligation. More participants perceive that their roles will decrease thorough ICT. However, participants are neutral whether ICT will increase their responsibilities in teaching with ICT.

Majority of the participants perceive that just having ICT competence is not adequate for ICT integration and pedagogical knowledge. They stated that pedagogical knowledge in addition to having ICT competence is necessary for the integration of ICT into education. Whereas some participants perceive as ICT competence and pedagogical knowledge complementary, others perceive pedagogical knowledge as a prerequisite. It is understood that pedagogical knowledge is a crucial component for ICT integration. According to Koehler, Mishra and Yahya (2007), technology cannot be thought of being separate and unrelated from teaching tasks and contexts. They support the complex interplay between technology, content and pedagogy.

The study shows that the participants use ICT with a basic level. They mostly use it for presentation in their teaching practices. Teachers use ICT with a basic or entry level (Açıkalın, 2014; Aslan & Zhu, 2014; Tezci, 2009). Teachers should use advanced ICT skills in their teaching practices and this will enhance teaching and learning process significantly.

The samples of this study were from six state universities and 782 pre-service teachers studying in their fourth year from the subject domains of Turkish language, social sciences, elementary education mathematics and science. A longitudinal study can be conducted with the same participants to investigate ICT integration in teacher education and its association with their teaching practices further in the future studies to find out to what extent their perceptions concerning the issue change. ICT integration in teacher education can be evaluated from the point of instructors, administrators and other stakeholders in education in future studies. The number of the universities, population and the variety of subject domains can be increased in future studies to study this issue further.

In conclusion, there are differences among the universities in terms of ICT integration sources. While some universities have more ICT integration sources, the others have less ones. In this regard, more investment in ICT integration sources has to be made to enable pre-service teachers to have access to the sources. The ICT courses, Computer I and II and ITMD, are the main courses in which pre-service teachers acquire ICT competences. These courses should be rearranged to make them more competent in ICT. In these courses, not only how to use technology, but also how technology can be used for teaching and learning should be focused on (Tondeur et al., 2011). In this regard, the courses should be revised considering pedagogical knowledge and content knowledge. The participants should be given more opportunity to use ICT in their teaching practices. It can be suggested that the hours of ICT courses be increased and ICT training be extended throughout the program. This can reduce their anxiety for ICT use and increase their tendency to use it in their teaching practices.

REFERENCES

- Açıklan, F. S. (2014). Use of instructional technologies in science classroom: Teachers' perspectives. *The Turkish Online Journal of Educational Technology*, 13(2), 197-201.
- Akbaba-Altun, S. (2006). Complexity of integrating computer technologies into education in Turkey. *Educational Technology & Society*, 9 (1), 176-187.
- Akbulut, Y., Odabaşı, H. F., & Kuzu, A. (2011). Perceptions of preservice teachers regarding the integration of information and communication technologies in Turkish education faculties. *The Turkish Online Journal of Educational Technology*, 10(3), 175-184.
- Alev, N. (2003). *Integrating Information and Communications Technology (ICT) Into Pre-service Science Teacher Education: The Challenges of Change in a Turkish Faculty of Education*. Unpublished PhD Thesis, University of Leicester, School of Education, UK.
- Aslan, A., & Zhu, C. (2014). Investigating variables to predict Turkish pre-service teachers' ICT integration into teaching practices. *Submitted to British Journal of Educational Technology*.
- Becker, H. J. (2000). Findings from the teaching, learning, and computing survey: Is Larry Cuban right? Retrieved October 10, 2014 from <http://www.crito.uci.edu/tlc/findings/ccsso.pdf>
- Beckers, J. J. & Schmidt, G. H (2003). Computer experience and computer anxiety. *Computers in Human Behavior*, 19, 785-797.
- Bozdoğan, D., & Özen, R. (2014). Use of ICT technologies and factors affecting pre-service ELT teachers' perceived ICT self-efficacy. *The Turkish Online Journal of Educational Technology*, 13(2), 186-196.
- Celik, V., & Yesilyurt, E. (2013). Attitudes to technology, perceived computer self-efficacy and computer anxiety as predictors of computers supported education. *Computers & Education*, 60, 148-158.
- Drent, M., & Meelissen, M. (2008). Which factors obstruct or stimulate teacher educators to use ICT innovatively? *Computers & Education*, 51, 187-199.
- Göktaş, Y. (2006). *The current status of information and communication technologies integration into schools of teacher education and K-12 in Turkey*. Unpublished PhD Thesis, Middle East Technical University, Graduate School of Natural and Applied Sciences, Turkey, Number of Thesis:199023.
- Göktaş, Y., Yıldırım, Z., & Yıldırım, S. (2008). The keys for ICT integration in K-12 education: Teachers' perceptions and usage. *Hacettepe University, Journal of Education*, 34, 127-139.
- Gulbahar, Y., & Guven, I. (2008). A survey on ICT usage and the perceptions of social studies teachers in Turkey. *Educational Technology & Society*, 11 (3), 37-51.
- Gündüz, Ş., & Odabaşı, F. (2004). Bilgi çağında öğretmen adaylarının eğitiminde öğretim teknolojileri ve materyal geliştirme dersinin önemi. *The Turkish Online Journal of Educational Technology*, 3 (1), 43-48.
- HEC (2006). Eğitim fakülte uygulanacak yeni programlar hakkında açıklama. Retrieved April 26, 2013, from http://www.yok.gov.tr/egitim/ogretmen/yeni_programlar_ve_icerik.htm
- Kay, R. H. (2006). Evaluating strategies used to incorporate technology into preservice education: A review of the literature. *Journal of Research on Technology in Education*, 38 (4), 383-408.
- Koehler, M. J., Mishra, P., & Yahya, K. (2007). Tracing the development of teacher knowledge in a design seminar: integrating content, pedagogy, technology. *Computers & Education*, 49(3), 740-762.
- Kozma, R. B. (2008). Comparative analysis of policies for ICT in education. In International Handbook of Information Technology in Primary and Secondary Education (eds J. Voogt & G. Knezek), pp. 1083-1096. Springer, New York, NY.
- ÖSYM (2012). ÖSYS Yükseköğretim programları ve kontenjanları kılavuzu. Retrieved February 12, 2013 from <http://www.osym.gov.tr/belge/1-13589/2012-osys-yuksekogretim-programlari-ve-kontenjanlari-ki.html>
- Pamuk, S., & Peker, D. (2009). Turkish pre-service science and mathematics teachers' computer related self-efficacies, attitudes, and the relationship between these variables. *Computers & Education*, 53, 454-461.
- Pelgrum, W. J. (2001). Obstacles to the integration of ICT in education: results from a worldwide educational assessment. *Computers & Education*, 37, 163-178.
- Pinedia, F. O. (2011). Competencies for the 21st century: Integrating ICT to life, school and economical development. *Procedia Social and Behavioral Sciences*, 28, 54-57.
- Teo, T. (2009). Modelling technology acceptance in education: a study of pre-service teachers. *Computers & Education*, 52, 302-312.
- Tezci, E. (2009). Teachers' effect on ICT use in education: The Turkey sample. *Procedia – Social and Behavioral Sciences*, 1, 1285-1294.
- Tondeur, J., Van Braak, J., Sang, G., Voogt, J., Fisser, P., & Ottenbreit-Leftwich, A. (2011). Preparing pre-service teachers to integrate technology in education: a synthesis of qualitative evidence. *Computers & Education*, doi:10.1016/j.compedu.2011.10.009.

- UNESCO.(2008). ICT competency standards for teachers, policy framework. Retrieved December, 2012, from, <http://unesdoc.unesco.org/images/0015/001562/156210e.pdf>
- Voogt, J., Knezek, G., Cox, M., Knezek, D., & Ten Brummelhuis, A. (2011). Under which conditions does ICT have a positive effect on teaching and learning? A call to action. *Journal of Computer Assisted Learning*. doi: 10.1111/j.1365-2729.2011.00453.x
- Voogt, J. & Roblin, N., P. (2012). A comparative analysis of international frameworks for 21st century competences: Implications for national curriculum policies. *Journal of Curriculum Studies*, 1-23.
- Yapıcı, İ.Ü. & Hevedanlı, M. (2012). International educational technology conference IETC2012. Pre-service biology teachers' attitudes towards ICT using in biology teaching. *Procedia Social and Behavioral Sciences*, 64, 633-638.
- Yücel, C., Acun, İ., Tarman, B., & Mete, T. (2010). A model to explore Turkish teachers' ICT integration stages. *The Turkish Online Journal of Educational Technology*, 9(4), 1-9.

APPENDIX I

Open ended questions in the survey

1. How have you accessed to ICT sources at the university? Have you had any difficulty in accessing ICT sources at the university?
 2. What do you think it can be done to promote the integration of ICT into teacher education better?
 - a) Physical factors:
 - b) Human factors:
 - c) Teacher training program:
 - d) Others:
 3. Have you had any difficulty in integrating ICT into your courses? If yes, what kind of difficulties are they? What do you suggest to tackle these difficulties?
 4. What do you think about the ICT courses in your teacher training program to integrate ICT into your lessons?

Computer I and II:

Instructional Technologies and Material Development:
 5. Do you think that having ICT competences is sufficient to integrate ICT into education effectively? Do teachers need to have pedagogical knowledge besides ICT competences in this regard?
 6. Do you have other suggestions concerning ICT integration into your lesson?
- Thank you very much for your assistance.

APPENDIX II

The Interview Questions for Pre-service Teachers

Name:

E-mail address:

Age

Gender Male ☐

Female ☐

Your university

☐ Aksaray University

☐ Dokuz Eylül University

☐ Fırat University

☐ Gazi University

☐ Marmara University

☐ Niğde University

Department

☐ Mathematics for primary and middle school Turkish Science education ☐

☐ Social Sciences

Turkish

☐

1- Are you interested in developing your skills and knowledge in ICT?

2- What do you think about the role of ICT in teaching learning process? Will ICT change the teaching and learning process?

3- Do you think that the integration of ICT into education will decrease the role and responsibility of teachers in classrooms?

4- As you know that there is a huge investment in ICT in Turkey. For instance, a new project called "FATİH" has been put into effect. Do you think that such huge investments are necessary for the integration of ICT into education?

5- What do you think about the advantages and disadvantages of ICT use in your subject matter?

6- What do you think about the integration of ICT into pre-service teacher education program?

7- Are the ICT courses in the teacher training program enough to prepare you to integrate ICT into your subject matter in your future teaching career?

Computer I and II:

Instructional Technologies and Material Development:

8- What could be done to improve the integration of ICT into pre-service teacher training program?

a) Physical factors:

b) Human factors:

c) Teacher training program:

d) Others:

9- What do you think about the integration of ICT into classes in lower secondary schools?

10- What could be done to improve the integration of ICT into classes into lower secondary schools?

a) Physical factors:

b) Human factors:

c) Teacher training program:

d) Others:

11- How do you evaluate the relationship between ICT competences and pedagogical knowledge in terms of the integration of ICT into education? Is pedagogical knowledge a prerequisite to integrate ICT into education?

12- On the whole, has ICT had an impact on your teaching?

13- Do you have anything else to add on the integration of ICT into education in terms of pre-service teacher training program or in lower secondary schools?

The interview is over. Thank you very much for your assistance.

APPENDIX III

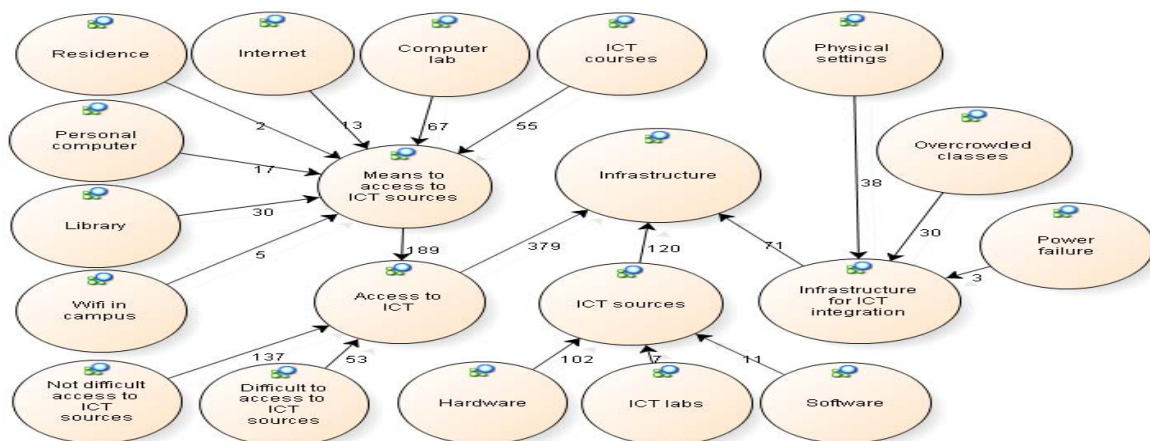


Figure 1. The theme and sub-themes for conditions for ICT integration in education with regard to infrastructure

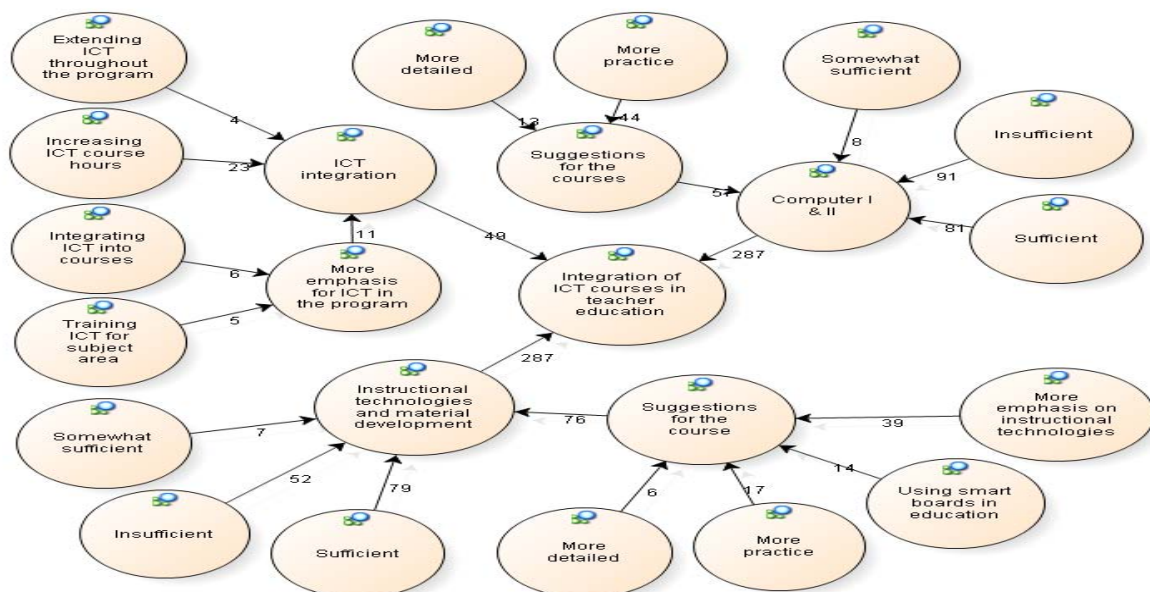


Figure 2. The theme and sub-themes for conditions for ICT integration in education with regard to integration of ICT courses in teacher education

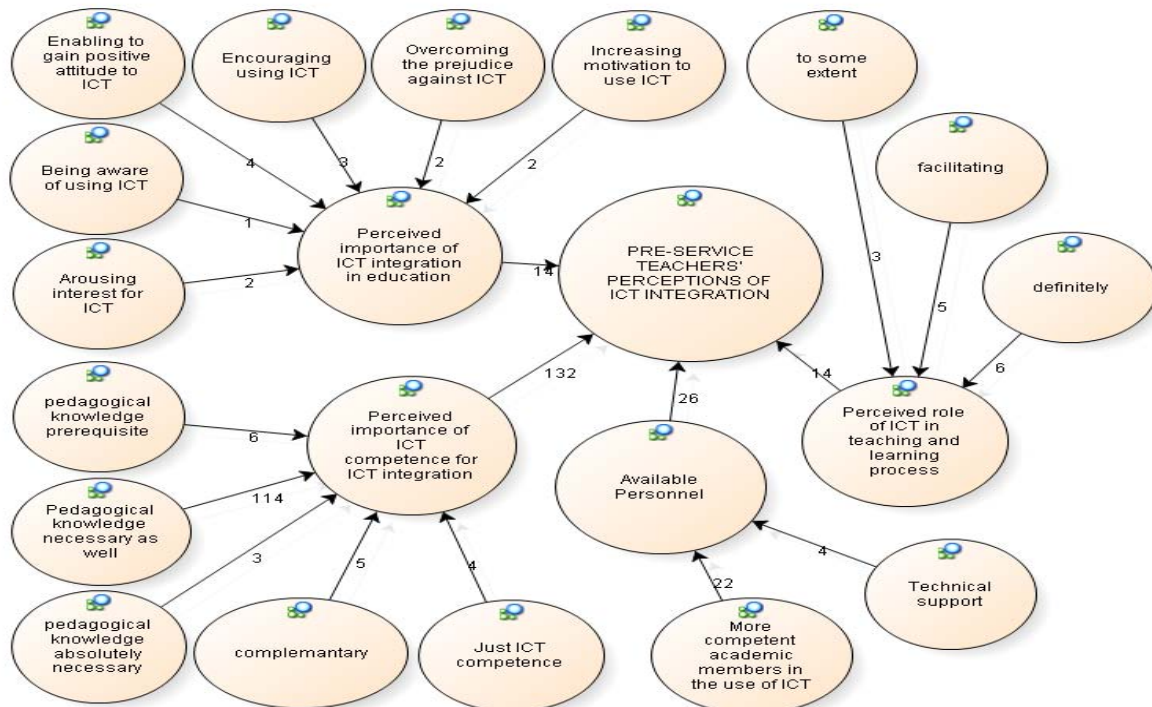


Figure 3. The theme for pre-service teachers' perceptions of ICT integration and sub-themes

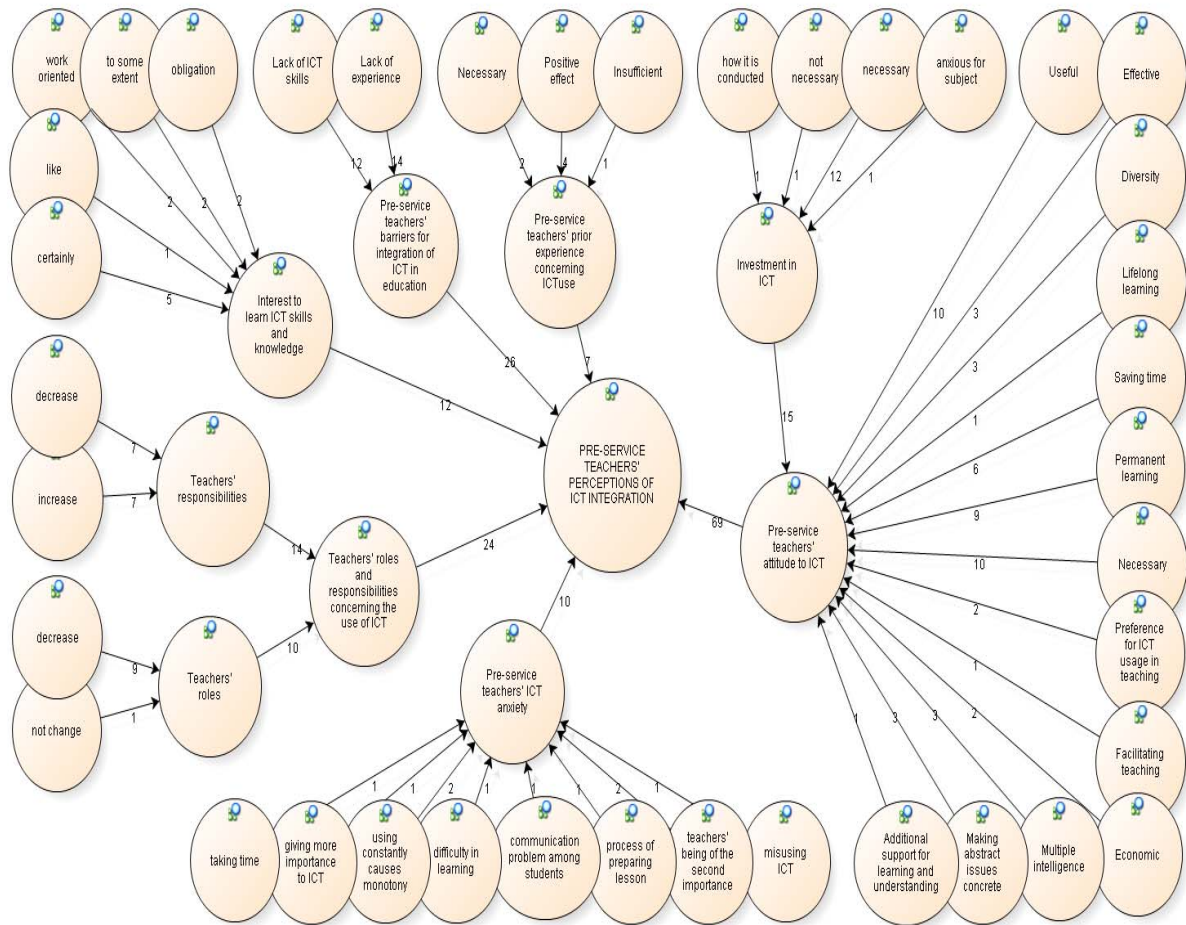


Figure 4. The theme for pre-service teachers' perceptions of ICT integration and sub-themes

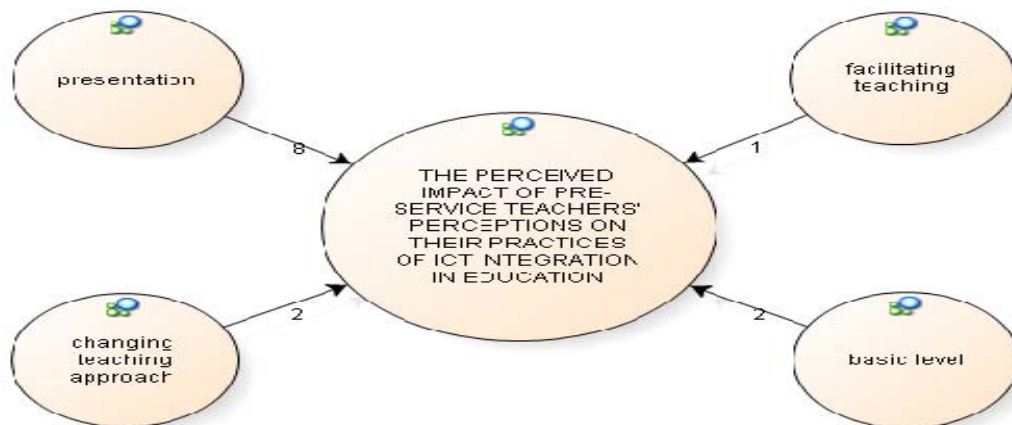


Figure 5. The theme for the perceived impact of pre-service teachers' perceptions concerning ICT integration in education on their practices and its sub-themes

Research and Trends in the Studies of Homeschooling Practices: A Review on Selected Journals

Khairul Azhar Jamaludin

*Faculty of Education, University of Malaya, 50603, Kuala Lumpur, Malaysia.
kayjamaludin@siswa.um.edu.my, drnorlidah@um.edu.my & dorothy@um.edu.my*

Norlidah Alias

*Faculty of Education, University of Malaya, 50603, Kuala Lumpur, Malaysia.
drnorlidah@um.edu.my*

Dorothy DeWitt

*Faculty of Education, University of Malaya, 50603, Kuala Lumpur, Malaysia.
dorothy@um.edu.my*

ABSTRACT

The practice of homeschooling still receives contrasting responses on its relevancy and effectiveness. The current study is aimed to map the trends in the selected eleven studies from various educational journals. The analysis focuses on mapping the trends on: a) research settings, b) target sample, c) method or instrument used, d) common focus or issues covered, and e) pattern in the findings of all selected studies. It is found that majority of the current studies were more focusing in evaluating the effectiveness and relevancy of homeschooling as an alternative to traditional schooling, especially on the area of effective learning experiences and healthy social development. Despite the strengths of homeschooling practice, this paper has also discovered the discrepancies in the findings of the current studies and provided recommendations for an effective homeschooling practice.

Keywords: homeschooling, home education, teaching and learning, curriculum.

INTRODUCTION

Crucial to academic success, homeschooling has become a growing education phenomenon across the globe. It appears that, in the teaching and learning of homeschooling, the academic inputs and outcomes are ‘tangible’ for parents in tailoring their children’s needs in learning. A structured homeschooling has proven to be effective in improving academic success (Cogan, 2010; Harding, 2013; Rudner, 1999). However, many researchers argued the basis of this claim. The current body of literature seems to suffer from poor empirical knowledge base and evidences in justifying the effectiveness of homeschooling. Murphy (2014) summarizes that studies on overall impacts of homeschooling are still lacking.

To further investigate the above argument, the current paper explored 11 recent studies (from 2011 to 2014) in understanding and mapping the trends and patterns of the selected studies.

RESEARCH PURPOSE

It is hoped that current paper would enlighten readers on the trends of the research and their findings in justifying the effectiveness of homeschooling in improving academic performance. Eleven recent articles published in 2011 to 2014 were selected from the Web Of Science under the keywords of ‘homeschooling’, ‘home school’ and ‘home education’. Only the studies that investigate the practice of homeschooling were selected for the analysis. It is our attention to provide an analysis of the selected studies as it is believed to serve as a relevant reference to understand the homeschooling practices.

In doing so, this study explored the research questions below:

1. Which research setting had high frequency in the selected studies?
2. What was the frequent target sample used in the selected studies?
3. What was the frequent method/instrument used in the selected studies?
4. What was the current focus or issue explored in the selected studies?
5. What was the pattern of the findings in the selected studies?

METHOD

The selected articles were retrieved from the Web Of Science, and were from various educational journals published in 2011 to 2014. The articles were from a) Journal of Adolescence, b) Sociological Spectrum, c) Procedia-Social and Behavioural Sciences, d) Transactions of the Institute of British Geographers, e) Gifted

Child Quarterly, f) Journal of Black Studies, g) Education and Urban Society, h) Focus on Autism and Other Developmental Disabilities, i) European Journal of Education, and j) Education as Change.

In finding the trends, all selected articles were cross analyzed to their journal details, research objectives, participants, data collection and analysis method, research findings, and focus or issues discovered. The variables, such as participants and settings, research design, and research focus were further analyzed statistically in mapping the trends of the current studies. In addition, a content analysis was conducted in exploring the common issues and patterns of findings by analyzing the research questions and focus of the selected studies. The frequency and percentage counts were used to visually represent and describe the trend and patterns of the selected current studies. Table 1 below summarizes the analysis of variables of all studies according to selected participants, research design, data collection method, data analysis, research setting, findings and focus or issue explored.

Table 1: Content analysis of selected eleven articles.

Study (Author/Year)	Participants	Data Collection	Data Analysis	Research Findings	Focus/Issues Discussed
Green-Hennessy, S. (2014).	182 351, 12 to 17 year-old adolescents from the National Survey and Drug Use and Health (NSDUH) participants in the United States.	Interviews and the Nicotine Dependence Syndrome Scale test.	Interview analysis based on: a) demographic and religion, b) delinquencies, c) substance misuse and prevention service, and d) schooling.	Religious homeschoolers and public schoolers were less likely to involve in juvenile delinquency. Homeschoolers are more likely to fall behind expected grade.	Comparing traditional-schooled and homeschooled adolescents with either lower or stronger religious in their achievements in academic, extracurricular participation and the misuse of substance and delinquencies.
Vigilant, L. G., Anderson, T. C., & Trefethren, L. W. (2014).	21 Euro-American, Christian males (fathers) in the upper midwestern states of North Dakota and Minnesota.	In-depth, face-to-face interviews (using structured questionnaire instrument) and ethnographic observations.	Interview analysis based on the role of the father in homeschooling environment.	The roles of the father in homeschooling include: being a 'helpmate' and 'spiritual leader', manager of interpersonal emotion and disciplinarian.	Analysing the role of father in homeschooling settings.
Korkmaz, H., & Duman, G. (2014).	130 respondents in a metropolitan area in Turkey.	Survey.	Analysis based on five domains: a) demographic characteristics, b) religious reason, c) lack of trust in public education, d) control over curriculum, and e) types of education and financial	Homeschooling can develop better character and morality, and provide supportive learning settings.	Exploring the public understanding of homeschooling.

			support.		
Kraftl, P. (2013).	30 homeschooling families in United Kingdom.	Interviews and observational visits.	The analysis of the interviews covered: a) life-history structure, b)spaces of learning, c)interactions between learning and everyday life, and d)ambitions held for homeschooling.	Meaningful learning happens on the move and in everyday spaces.	Exploring the homeschooling practices and to map the 'geographies' of space, motivation and experiences of homeschooling.
Jolly, J. L., Matthews, M. S., & Nester, J. (2012).	13 parents from four different regions of the United States.	Homeschooled gifted children survey (initially conducted in 2009), and interviews.	The analysis of the interviews covered: a) children's abilities, b) experiences with public school, c)perceptions of challenges.	The sense of 'order and empowerment' is the main reason for homeschooling.	Exploring the parents' perspectives to homeschool their gifted children.
Mazama, A., & Lundy, G. (2012).	74 Black homeschooling parents from Mid- and South Atlantic and the Midwest.	Interviews (semi-structured and open-ended), survey (demographic background) and observations.	The analysis of data covered: a)demographic background – ethnicity, origin, children characteristics and education level of parents. b)reasons for homeschooling,	Racism interfered and affected their children's learning in normal school.	Unveiling the issue of racism as one of the main reason to homeschooling.
Hanna, L. G. (2012).	250 homeschooling families from urban, suburban and rural areas within the Commonwealth of Pennsylvania.	Interviews (open-ended questions on the phone and computer), questionnaire.	The analysis of data explored: a) demographic information of instructors and children, b) methods, materials and curriculum used, and c) motivation.	Parents from different areas have different philosophy and practice of teaching.	Exploring the trends of homeschooling practices by critically considering the types of methods, materials and curricula used by parents.
Hurlbutt, K. S. (2011).	Ten parents from nine families who homeschool their ASD children in Mid-Western U.S.	Interviews with parents.	The data were analyzed using open-coding procedure that covers: a) parental responsibilities and education, b) conflicts with school,	Parents who chose homeschooling viewed their commitment as mutual decision in providing effective learning settings to their	Exploring parents' perceptions and experiences of homeschooling ASD children.

			and c) monitoring, and curriculum.	ASD children.	
Ice, C. L., & Hoover-Dempsey, K. V. (2011).	64 parent-child dyads (30 public and 34 homeschooler parents) in the U.S.	Questionnaire on parent involvement and parent's motivation for involvement.	The data were analyzed by correlations and hierarchical regressions analysis.	Homeschooling parents have stronger efficacy, role activity beliefs and social network beliefs in teaching their children.	Focusing on comparing the parents' motivations in homeschooling and public schools.
Blok, H., & Karsten, S. (2011).	14 European countries (excluding Eastern and Southern Europe).	Self-reporting, home-visits and contacts with parents or children.	Compiling the national cases and fabricated and compared case-descriptions.	The general function of inspection is to accommodate children's learning environment and to monitor their progress.	Investigating the home-education inspection practices in European countries.
van Schalkwyk, L., & Bouwer, C. (2011).	Four homeschooling families (two Afrikaans-speaking, one English-speaking and one Asian family) in South Africa.	Case study method, which includes unstructured interviews, reflective interviews, field notes and reflective journals.	The data were analyzed using verbatim transcriptions and discourse analysis.	In a unique case, homeschooling practice was more oriented to the mother's discourse and goals.	Exploring the homeschooling practices from different angles: parents and children.

RESULT AND DISCUSSION

Research settings

Out of 11 studies, most studies were conducted in United States of America (63.64%). Other countries share the same frequency (1) and percentage (9.09%), as represented in Table 2.

Table 2: Summary of research settings of selected eleven articles.

Research setting	Frequency	Percentage
United States	7	63.64
Turkey	1	9.09
United Kingdom	1	9.09
European countries	1	9.09
South Africa	1	9.09

The development of homeschooling in United States of America started since 17th to 18th century as an alternative to cater the needs of children's learning and religious practices (Ray, 2002; Wilhelm & Firmin, 2009). It is undeniable that homeschooling in U.S. has undergone numerous changes in its structure and visions. The diversity of ethnicities and cultures in U.S. has shaped homeschooling education as one of the medium to unite and strengthen the bond through education, under the Compulsory Attendance Law 1918 (Bellini, 2005). With the rapid changes in homeschooling practices in U.S, ongoing dilemmas and concerns have shaped the possible forms of the homeschooling practices in the recent years. For instance, Mazama and Landy's (2012) study has explored the issue of racism that occurred in public school and how homeschooling is viewed as an alternative to restore children's self-confidence and healthy learning environment. On the other hand, Green-Hennesy (2014) and Vigilant, Anderson and Trefethren (2014) have explored the religious practices of homeschooling and its contribution to academic success. The depth of the literature in the U.S. has provided a clearer developmental phase of homeschooling, which started from a medium of unity and Christianity to academic achievements from different angles.

On the other hand, the other studies focus on gathering an overall overview of homeschooling practices at national level. Kraftl's (2013) study focuses on mapping the geographies of homeschooling in United Kingdom by generally investigating the space of learning at national level. Similarly, Blok and Karsten (2011) focuses on investigating the practices of homeschooling from the inspectorate practices at international level, in almost all European countries excluding Eastern and Southern Europe. Only one study was conducted in Turkey in gathering public views of homeschooling because it was yet to be legally practiced in Turkey (Korkmaz & Duman, 2014).

Sample selection.

From selected eleven articles, the sample selections are categorized as in Table 3.

Table 3: Summary of sample selection of selected eleven articles.

Sample selection	Frequency	Percentage (%)
Homeschooling parent(s)/families	7	63.64
Homeschooling parents with special/gifted children	2	18.18
Adolescents (homeschoolers and public schoolers)	1	9.09
Parents with no homeschooling experience	1	9.09

Most researchers (63.64%) have selected homeschooling parent(s) or families as their sample. These parents and families are the agent of homeschooling practices and thus, their insights about homeschooling practices and its effectiveness are highly relevant to these studies. As defined by Korkmaz and Duman (2014), homeschooling parents play an important role in educating and structuring their children's learning at home. Lois (2013) claims that one of the role that most parents play is mother-teachers. However, out of seven articles, a study by Vigilant et al. (2014) has explored Christian fathers' role in homeschooling settings. This study has expanded the perspective of homeschooling practices, which were typically being associated with mothers. The fathers function as helpmate, spiritual leader, disciplinarian and manager of learning and relationship quality (Vigilant et al., 2014).

The other studies have explored the role of parents and family in different home-education settings. For instance, Hanna (2012) explored the differences of homeschooling practices in urban, suburban and rural areas. Similarly, van Schalkwyk & Bouwer (2011) explored racial and language backgrounds as the focus in describing the differences of homeschooling practices. Two studies were conducted to focus on homeschooling practices at a larger scale: homeschooling families in United Kingdom (Kraftl, 2013) and the role of homeschooling inspections in most European countries (Blok & Karsten, 2011).

On the other hand, there are two studies that focus on homeschooling parents with special (Hurlbutt, 2011) and gifted children (Jolly, Matthews & Nester, 2012). These studies have investigated the parents' decision to homeschool a and discovered the drawbacks of public schooling in catering their children's learning needs. Very differently, a study by Korkmaz and Duman (2014) focuses on parents with no homeschooling experience because this alternative education was not legally practiced in Turkey. Lastly, Green-Hennessy's (2014) study directly compared homeschooling and traditional school adolescents in their involvement with substance misuse and academic performances.

Data collection method

Three different types of methods or instruments were used across all eleven studies, as represented in Table 4. Some of the studies combined more than one instrument.

Table 4: Summary of method/instrument used in selected eleven studies.

Method/instrument	Frequency (n/11)	Percentage (%)
Interviews	9	81.82
Survey/Questionnaire	6	54.55
Observations	5	45.45

Majority of the studies (81.82%) employed interviews as the main source of data collection, followed by survey or questionnaire (54.55%) and observations (36.36%). Most of the interviews were conducted using thematic prompts in gathering the insights of homeschooling practices (Hanna, 2012; Jolly et al., 2012; Kraftl, 2012; Mazama & Lundy, 2012).

On the other hand, the surveys or questionnaires used in all six studies have different focus and can be categorized into five themes: a) substance misuse (Green-Hennessy, 2014), b) preliminary insights of

homeschooling (Korkmaz & Duman, 2014) c) gifted and special-needs survey (Jolly et al., 2012), d) demographic and cultural background (Mazama & Lundy, 2012), and e) homeschooling practices (Hanna, 2012; Ice & Hoover-Dempsey, 2011).

Lastly, observations were conducted on both parents and children during homeschooling teaching and learning. From all four studies, there are five different focal points in the observations: a) the role of father (Vigilant, Anderson & Trefethren, 2014), b) teaching and learning spaces and materials (Kraftl, 2013), c) racial protectionism in learning settings (Mazama & Lundy, 2012), d) the role of inspections in homeschooling (Blok & Karsten, 2011), and e) parent-child homeschooling discourses and participations (van Schalkwyk & Bouwer, 2011).

Interestingly, Murphy (2014) argues that most studies in 1980's and early 2000's have contributed little empirical evidences on the effectiveness of homeschooling. Typically, the past studies only explored and described the practice of homeschooling and have overlooked its effects on children's learning and development. However, the above findings have added flesh in describing the trend of the current studies in the area of homeschooling development and practices. It is apparent that the recent studies have explored and gathered empirical-based evidences in describing homeschooling development and practices. For instance, Ice and Hoover-Dempsey (2011) have discovered the correlation between parental motivation and students' achievement in homeschooling using hierarchical regression and correlation analysis. Other studies (Green-Hennessy, 2014; Hanna, 2012; Korkmaz & Duman, 2014;) have similarly explored the relevance of homeschooling from different angles, and proposed a strong foundation of empirical evidences to support homeschooling practices.

Focus and issue covered.

The studies in the area of homeschooling have explored various angles and perspectives in describing and justifying the relevancy of homeschooling as an alternative education. Table 5 represents the focus or issue explored in all eleven articles.

Table 5: Focus or issue covered in selected eleven studies.

Focus/Issue	Frequency	Percentage(%)
Homeschooling as an effective and healthy learning alternative.	5	45.45
Homeschooling practices.	4	36.36
Role of inspections in homeschooling settings.	1	9.09
Public views and undstanding of homeschooling.	1	9.09

Majority of these studies (45.45%) examined the homeschooling as an effective and healthy learning alternative. From all five studies, there are two studies uncovered the importance of homeschooling for gifted and special-needs children (Hurlbutt, 2011; Jolly et al., 2014). These studies illustrated that public schools are incapable to cater to their children's needs of learning. A study by Mazama and Lundy (2012) similarly noted that traditional schooling in the Mid and South Atlantic and the Midwest of America, was not a healthy environment for the children due to racism and racial prejudices. The other two studies were focusing on comparing homeschooling with traditional schooling based on delinquency rate (Green-Hennesy, 2014), academic achievement and motivational level of parents (Ice & Hoover-Dempsey, 2011).

On the other hand, there are four studies explored on mapping the homeschooling practices. It is apparent that the homeschooling practices might vary geographically. The cultural background (van Schalkwyk & Bouwer, 2011), locations (Hanna, 2012) and personal beliefs (Kraftl, 2013) are among influential factor to the designated homeschooling practices. In another study, Blok and Karsten (2011) have investigated the role of inspections in homeschooling settings. This study provides a different angle on how educational inspections might help to accommodate and shape a 'standardized' homeschooling learning experiences.

Lastly, there is only one study (Korkmaz & Duman, 2014) that focuses on gathering public view on what is needed for an effective homeschooling practice in Turkey. This study has contributed in representing the 'ideal' structure and implementation to suit the localized context of homeschoolin in Turkey. In short, the above studies have contributed to the lacuna of literature by exploring the homeschooling practices in different angles and the findings might serve as a relevant point of reference to improve the current practices.

Themes of the findings across all studies.

a) The potential of homeschooling as an effective alternative to traditional education.

The present study has indicated the trends of the current literature of homeschooling practices. Positive outcomes to support homeschooling were witnessed in the majority of the selected studies. The parental involvement in

children's learning has been associated as a catalyst to success. One of the reasons of homeschooling is the inability of traditional schooling to support the learners' needs (Kraftl, 2012; Jolly, et al., 2012; Vigilant et al., 2014). There were three dimensions on how homeschooling works in improving learning; a) to provide one-to-one support to learning, b) to create a safe and healthy learning environment, and c) to provide adequate and appropriate learning supports for special-needs and gifted children. Primarily, the researchers agreed that space and learning experiences at home have fabricated meaningful learning experiences. For instance, Kraftl (2013) found that learning at home does not restrict to textbook learning and standardized curriculum. Learning happens inside and outside the house and thus, the dimension of learning in homeschooling covers academic and practical knowledge (Kraftl, 2013). Similarly, Ice and Hoover-Dempsey (2011) elucidated that homeschooling parents have stronger efficacy in designing and fabricating effective learning. This may attribute to the academic success of the children. Secondly, a safe and healthy learning environment seems to be neglected in public schooling (Mazama & Lundy, 2012). The issues such as racism and racial prejudices in the public school have affected the African-American children, even with the racial protectionism being practiced in the public schools (Mazama & Lundy, 2012). Hence, homeschooling is an alternative to provide a safer and healthy learning environment for the affected children. Also, Vigilant et al. (2014) has mapped how the role of father is important to structure and balance the learning at home. The elements of spiritual beliefs and discipline in learning have been given a strong emphasis in achieving a well-balanced education, which also agrees with Charlotte Mason's ideal learning belief (Simply Charlotte Mason.com, 2011). Lastly, the incompetency of traditional schools in catering the needs for the gifted and special-needs children has also shifted the space of learning to be conducted at home (Hurlbutt, 2011; Jolly et al., 2012). The parents believe that a sense of order and empowerment in deciding their children's learning pace and experiences has made them to de-school their children (Jolly et al., 2012) and to provide better learning opportunities for their children.

Very differently, Green-Hennessy (2014) and van Schalkwyk and Bouwer (2011) have discovered that homeschooling practices have several drawbacks. In a larger study, it is found that, the homeschooling adolescents were reported to fall behind in academic performance and faced more social difficulties compared to traditional schoolers (Green-Hennessy, 2014). In addition, van Schalkwyk and Bouwer (2011) have appointed that the homeschooling children might face difficulties in social interactions due to the strong attachment to parental supervision. Also, they noted that many homeschoolers suffer as their development and interest have to compromise with their parents' established visions and goals. In short, there are several limitations that should be considered when conducting the home-education, especially the one concerning on the direction of homeschooling practices and its structure. Nevertheless, the previous studies have proven that structured and flexible homeschooling learning was effective to overcome the above conditions (Cogan, 2010; Harding, 2013; Rudner, 1999).

b) The considerations for an effective homeschooling practice.

The selected articles for this study have appointed considerations and recommendations for an effective homeschooling practice. Mainly, the practice should consider an ample attention to children-parents goals and learning structure. Most of the studies have highlighted the importance of establishing teaching approach to suit children's learning needs (Hanna; 2012; Hurlbutt, 2011; Ice & Hoover-Dempsey, 2011; Kraftl, 2013). Even though the practice of homeschooling is to overcome the drawbacks of traditional schooling, there are a number of cases that reflected that the incompetency of parents in conducting the homeschooling. Green-Hennessy (2014) reported that even though the ideological homeschoolers were less likely to indulge in juvenile delinquency, their academic performances were still behind compared to traditional schoolers. Also, the pedagogical homeschoolers were found to be more likely to involve in substance misuse. Green-Hennessy (2014) claims that the parents' lax attitude in inculcating awareness and preventions is the contributing factor to above condition.

In Kormaz and Duman's (2014) study, the parents addressed that limited knowledge on curricula, theoretical, and practical scientific knowledge were among the challenges in conducting homeschooling. In dealing with this concern, some parents approached this using multiple resources, such as purchased curricula and district materials in preparing the teaching and learning lessons (Hanna, 2012). The findings of Hanna's (2012) study also suggested that the use of information and communication technology (ICT) might assist learning in equipping them to be 21st century learners (Norlidah Alias, Mohd Nazri Abdul Rahman & Saedah Siraj, 2014). Secondly, the support from the government is found to be helpful for homeschooling practices. Kormaz and Duman (2014) highlighted that the parents who wish to homeschool their children still require support from the government in term of materials, financial and chances to attend some classes in public school. In addition, Blok and Karsten (2011) claims that homeschooling inspections are needed to accommodate and monitor children's learning. The monitoring and mentoring by the government is relevant in maximizing the 'quality' of homeschooling learning and to avoid them to be left behind from public schooling (Blok & Karsten, 2011).

In the case of home education, the above recommendations can be considered into its implementation. The drawbacks in its practice still can be reconditioned. The flexibility of homeschooling teaching (Blok, 2004) is one of the important characteristics that can help to constantly improvise its practice. The above suggestions are derived from the current body of literature, reviewed in this paper, and are relevant to be considered in enhancing homeschooling implementation.

CONCLUSION

The overall aim of this paper was to map the trends of the current studies in the area of homeschooling development and practices, through the analysis of the research settings, sample selection, methods and instruments, focus and issue covered as well as the similarities and differences in the selected studies. Overall, it is apparent that most studies were conducted in United States of America. These studies have discovered numerous issues from effectiveness of homeschooling to racial protectionism in teaching and learning environment. It is also found that most studies were focusing on gathering insights from the parents in reviewing the practices of homeschooling. This is most resonant to the focus of the most studies, which was to evaluate the effectiveness of homeschooling in providing an effective and conducive learning setting.

Interestingly, the current studies have also tried to add flesh to literature by providing ample empirical evidences in justifying the importance of homeschooling. Previous studies, such as in 1980's and early 2000's were suffering from poor empirical-based evidences (Murphy, 2014) as they sought to only describe the practice without majorly investigating the effects of homeschooling practices on children's development and learning outcomes. Nevertheless, the finding of this paper has indicated the opposite. There are a number of studies that have further explored this matter from various angles, such as the effect of homeschooling on involvement in juvenile delinquency, parents' motivation and students' achievements, and homeschooling teaching practices and academic achievements.

In short, homeschooling has offered a flexible learning for children who might face difficulties in traditional schooling. Issues such as racism, special needs in learning, and incompetency of traditional learning were able to be resolved through homeschooling implementation. However, there are still areas that can be improved such as in maximizing the support material and other educational supports from the government. Also, informational and communication technology has a brighter potential to further develop a strong learning community and access to relevant materials to homeschooling learning.

REFERENCES

- Bellini, L. (2005). Homeschool families, public schools and the superintendent: An analysis of interactions in New Jersey and Pennsylvania. *Dissertation Abstracts International*, 66/03, pp.833. (UMI no. 3166560).
- Blok, H., & Karsten, S. (2011). Inspection of Home Education in European Countries. *European Journal of Education*, 40/1, pp.138-152.
- Cogan, M. (2010). Exploring academic outcomes of homeschooled students. *Journal of College Admission*, 208, pp.19-25.
- Green-Hennessy, S. (2014). Homeschooled adolescents in the United States: Developmental outcomes. *Journal of Adolescence*, 37, pp.441-449.
- Hanna, L. G. (2012). Homeschooling Education: Longitudinal Study of Methods, Materials, and Curricula. *Education and Urban Society*, 44/5, pp.609-631.
- Harding, T. A. (2003). *A submission for the Home Schooling Review*. Brisbane: Australian Christian Academy.
- Hurlbutt, K. S. (2011). Experiences of Parents Who Homeschool Their Children With Autism Spectrum Disorders. *Focus on Autism and Other Developmental Disabilities*, 26/4, pp.239-249.
- Ice, C. L., & Hoover-Dempsey, K. V. (2011). Linking Parental Motivations for Involvement and Student Proximal Achievement Outcomes in Homeschooling and Public Schooling Settings. *Education and Urban Society*, 43/3, pp.339-369.
- Jolly, J. L., Matthews, M. S., & Nester, J. (2012). Homeschooling the gifted: A parent's perspective. *Gifted Child Quarterly* 57(2), pp.121-134.
- Korkmaz, H., & Duman, G. (2014). Public understanding about homeschooling: A preliminary study. *Procedia - Social and Behavioral Sciences*, 116, pp.3891 – 3897.
- Kraftl, P. (2013). Towards geographies of 'alternative' education: A case study of UK homeschooling families. *Transactions of the Institute of British Geographers*, 38, pp.436-450.
- Lois, J. (2013). *Home Is Where the School Is: The Logic of Homeschooling and the Emotional Labor of Mothering*. New York: New York University Press.
- Mazama, A., & Lundy, G. (2012). African American Homeschooling as Racial Protectionism. *Journal of Black Studies*, 43(7), pp.723-748.

- Murphy, J. (2014). The social and educational outcomes of homeschooling. *Sociological Spectrum*, 34, pp.244-272.
- Norlidah Alias, Mohd Nazri Abdul Rahman & Saedah Siraj (2014). *Homeschooling: Pendidikan alternatif di Malaysia (Homeschooling: An alternative education in Malaysia)*. Kuala Lumpur, Malaysia: Pearson Malaysia Sdn Bhd
- Ray, B. D. (2002). Customization through homeschooling. *Educational Leadership*, 59/7/, pp.50-54.
- Rudner, L. M. (1999). Scholastic achievement and demographic characteristics of home school students in 1998. *Educational Policy Analysis Archives*, 7(8), pp.1068-2341.
- Simply Cahrlotte Mason.com (2010). *What is the Charlotte Mason method?*. Retreived <https://simplycharlottemason.com/what-is-the-charlotte-mason-method/>
- van Schalkwyk, L., & Bouwer, C. (2011). Homeschooling: Heeding the Voices of Learners. *Education As Change*, 15/2, pp.179-190.
- Vigilant, L. G., Anderson, T. C., & Trefethren, L. W. (2014). ‘I’m sorry you had a bad day, but tomorrow will be better’: Stratagems of interpersonal emotional management in narratives of Fathers in Christian homeschooling households. *Sociological Spectrum*, 34, pp.293–313.
- Wilhelm, G., & Firman, M. (2009). Historical and contemporary development in home school education. *Journal of Research on Christian Education*, 18, pp.303-315.

Seamless Support: Technology Enhanced Learning in Open Distance Learning at NWU

Hennie Esterhuizen

Manager: e-Learning Support, Unit for Open Distance Learning (UODL), North-West University, Potchefstroom Campus, Private Bag X6001, Potchefstroom 2520, South Africa
Hennie.Esterhuizen@nwu.ac.za

ABSTRACT

Frantic attempts of investing in technology to demonstrate willingness to educate for the knowledge society may result in failure to address the real requirements. This paper presents the main features of a framework for integrating Technology Enhanced Learning in Open Distance Learning at North-West University, South Africa. Support towards building trust to attempt using technology, exposure to technology and promoting accomplishment is presented as a focus in the framework. Large numbers of practising teachers improving their qualifications through distance learning are not yet using electronic learning technologies. To overcome the digital divide in developing contexts requires responsible planning, commitment and empowerment on the part of university management in conjunction with pre-emptive support in response to changing people-centred requirements through continuous feedback. The one-sided nature of top-down interventions on the part of the university contrasts with necessary unobtrusive pre-emptive support as a result of requirements identified through bottom-up feedback. The framework emerged from an adapted design-based research approach of design cycles to identify aspects to include in the framework on how to address a satisfactory attempt. Support to enable living and learning using technology is required to shift teacher-students and faculty with declared intentions to use technology to progress towards adoption.

Keywords: Technology enhanced learning, Learning technology integration, e-learning implementation, social transformation, student support, faculty training; teacher-students.

INTRODUCTION

The position of this paper is that to empower faculty and students in a developing context to overcome the digital divide (Dutta & MIA, 2011; Mutula, 2008; Norris, 2001) requires support characterised by a strategy with dual approaches. From a top-down as well as a bottom-up approach, firstly the university as institution should officially sanction technology enhanced learning (TEL) as a considered teaching and learning priority. Bold initiatives are required demonstrating evidence of responsible planning, commitment and empowerment on the part of the higher education institution (HEI). Through declarative visible interventions this top-down approach should demonstrate intent aimed at initiating action and gaining trust. On the other hand, unobtrusive pre-emptive support must be established in response to changing people-centred requirements through continuous feedback. This bottom-up approach should transform HEI environments as a result of listening to latent, unuttered requests of involved stakeholders and provide pre-emptive sustained but evolving support towards people-technology interaction. Productive and pleasurable educational transactions by students and faculty will testify to the success of HEI initiatives towards successful integration of TEL. Empowerment initiatives in the form of comprehensive support should aim to enable effortless technology enhanced teaching and learning experiences.

We would argue that such empowerment could be labelled *seamless support*. When driving across a bridge, ultimate functionality in civil engineering design is apparent when driver and passengers are unaware of the structure or the inconvenience. Bridges may be designed to impress with elaborate superstructures, but then the aim is not only functionality. In the analogy applied to this paper, functional learning technology support is effective when participants in the learning experiences are unaware of the efforts and costs involved in the provision of enjoyable and lasting learning experiences. There may be advanced learning goals where problem-based learning requires students to become aware of difficulties in order to build their competence, but that would follow once they have confidence in their ability to navigate the familiar. Obstacles in the learning path should be avoided unless they serve a learning purpose. Open distance learning (ODL) aims to remove unnecessary barriers and provide learning, focusing on the requirements of learners (Butcher & Wilson-Strydom, 2008). These learners may be busy with a full time occupation and have many personal responsibilities, pursuing further studies amidst considerable personal sacrifice (H D Esterhuizen, 2011-2012).

Especially in developing contexts, large numbers of students are trapped beyond the digital divide by technological disadvantage and digital illiteracy. Although universally accepted, HEIs require transformation (Blin & Munro, 2008; MacKeogh & Fox, 2008; Taylor, 2001). The diversity of areas in need of transformation

may result in paralysis if left solely to evolution, resulting in extinction. HEI survival strategies developing through unhurried evolutionary processes may not generate critical mass to energise rescue interventions. The HEI management's role in the integration of learning technologies in higher education may happen either through reluctant consent or through active intervention.

THE CONTEXT

The Republic of South Africa comprises nine provinces with eleven official languages. The World Bank report on South Africa describes it as one of the most unequal societies in the world, with the top quintile accounting for 58% of the country's income and the bottom quintile accounting for 0.5% (World Bank, 2012). While South Africa has the continent's largest economy by far, unemployment levels are some of the highest in the world. The inability to create employment opportunities on a large enough scale necessitates a special focus on human capital development through education since assistance through social grants is neither sufficient, nor sustainable. The North-West University (NWU) in the North West Province of South Africa has three campuses: Mafikeng Campus, Potchefstroom Campus, and Vaal Triangle Campus. Approximately 30 000 of the about 60 000 teacher-students registered at the Potchefstroom Campus are unqualified or under qualified practising teachers, improving their qualifications through ODL, living and working in all nine provinces in South Africa and in the neighbouring countries, Namibia and Botswana. Contact sessions at 39 support centres across Southern Africa including four in Namibia augment ODL provided through a second generation correspondence distance education model (Taylor, 2001) at the School of Continuing Teacher Education (SCTE), NWU. The SCTE is a successful ODL provider. Reviews by an international panel of experts confirm quality standards at the SCTE (Aguti, Banks, Downes, & Henderikx, 2010). However, inadequate access, computer illiteracy, technological disadvantage and technophobia hamper implementation of electronic learning technologies.

TECHNOLOGY ENHANCED LEARNING INTEGRATION FRAMEWORK

This paper presents the main features of a framework for the integration of TEL in ODL at NWU comprising prominent aspects and how to address these. The framework emerged from an adapted design-based research (DBR) strategy (Van den Akker, Gravemeijer, McKenney, & Nieveen, 2006) involving methodological pragmatism as a method of inquiry (Maxcy, 2003, p. 81). As participant observer in this research process, the first author was appointed e-learning manager at SCTE NWU from the beginning of 2011. His responsibilities include strategic planning and implementation of e-learning, research on integration of TEL in the context of SCTE, as well as development and implementation of academic staff training in the use of learning technology. Urgent implementation of solutions necessitated the use design research methods so that research and development could be performed simultaneously (Barab & Squire, 2004).

The Push to Participate

It is crucial to urgently develop 21st Century Skills (UNESCO, 2002; White, 2009) of students and faculty for survival in the knowledge-based society (MacKeogh & Fox, 2008) (Pelgrum, 2008). University management may agree with this statement and analyse the required characteristics of a modern day university. This may result in increased emphasis on the role of information communication technologies (ICTs) in the teaching and learning strategy and formulation of policies. Likely outcomes may be revised policies containing stronger emphasis on technology use. Such top-down approaches may result in failure to address the real requirements needed to engage academic staff and students (MacKeogh & Fox, 2008).

From the perspective of SCTE faculty, we expect reactions to such initiatives to lie on a continuum between enthusiasm, and reservation. We do not consider those with reservations to doubt the need for learning technology adoption; we rather expect them to doubt their own courage to optimistically engage with technology. Faculty with enthusiasm may welcome initiatives which they expect to be interventions addressing barriers to adoption. Previous research determined that faculty and teacher-students at the SCTE NWU are already convinced that learning technologies and the use of ICTs in teaching and learning hold solutions to their learning requirements and will directly benefit their learners (Hendrik D Esterhuizen, Blignaut, & Ellis, 2012; Hendrik D Esterhuizen, Blignaut, Ellis, & Els, 2012). World-wide faculty feel responsible to embrace technologies in teaching and learning, but many find it difficult to show convincing progress (Lin, 2011; MacKeogh & Fox, 2008). Frantic attempts of investing in technology to demonstrate willingness to educate for the knowledge society may result in failure to address the real issues and requirements. Establishment of personal profiles requiring registrations and passwords on more and more networks allow individuals access to novel information gathering and sharing, and personal association platforms. In these social spaces they get connected; adding circles of friends and contacts through proliferating electronically connected tools and gadgets. Multiplexing attention spans between increasing numbers of information clusters wearies and diverts. Some educators feel compelled to, however fretfully, stamp digital footprints in cyberspace to prove their

residency in the knowledge society. On the other hand, a renewed perspective from essentials in teaching and learning, enquiring about requirements of learners, and mature application of experience may better satisfy learning requirements of students as well as faculty. People-centeredness in education promises hope for efficient and enjoyable learning. Using novel social networking tools to address learning requirements will over time systematically add convincing fortifications to an arsenal of useful learning technologies while learning requirements drive the process.

While perpetual learning ("Lifelong Learning": Beller & Or, 1998; Longworth & Davies, 1996) is a worthy life goal and inquisitiveness a human virtue, self-fulfilment is best reached voluntarily. Pursuing success is more efficient while riding the wave of technological innovation; feeling in control reassures, while being pushed perpetuates panic. Calls for reevaluating priorities in education include focusing on people and pedagogy instead of on technology per se. Learning and living with technology should be about people enjoying life, ambition and attainment, rising to challenges, overcoming barriers, gratitude, and upgrading their competencies.

Observations on how to accommodate the so-called Net Generation (Oblinger & Oblinger, 2005) may have contributed to technology investment initiatives in desperate attempts to move ahead in education. Perspectives of present technological innovations built on mounds of innovation of previous generations appear when even younger generations are disappointed in their ability to apply their technological dexterity to practical academic use. Growing instances of inadequate literacy, including computer literacy in younger learners, focus on the necessity for cooperation across generations (Müller, 2011; OECD, 2010). Younger generation learners do not represent a homogenous group with similar characteristics in terms of technology adeptness (Sánchez, Salinas, Contreras, & Meyer, 2010). While there are certainly some young learners who excel independently, many require support in living and learning, using technology in general. David White considers the skills many young people have in technology use for social networking to be *communal*, not *collaborative*, and as a result they do not perform as well as anticipated in utilising technology in educational settings (Melrose Training, 2011).

Intentions to Adopt Technology in Teaching and Learning

We initiated approaches to ascertain enablers and barriers to learning technology adoption at SCTE from the perspectives of participants to provide substance to a framework for the integration of TEL. The Technology Acceptance Model (TAM) is an adaptation of the theory of reasoned action by Fishbein and Ajzen (1975). Davis, Bagozzi and Warshaw (1989) applied TAM to investigate why people accept and reject information technologies. The TAM predicts actual technology use from *intention to use* through *perceived usefulness* and *perceived ease of use* of technology as preconditions. Taking cues from the TAM, a survey instrument was developed with the specific intention of learning more about perceptions of SCTE teacher-students who experienced difficulty with computer literacy. The survey comprised single-input and open-ended questions that collected data from a purposeful sample of 338 teacher-students attending additional contact sessions after unsuccessfully completing a computer literacy course. The questions probed perceived usefulness and ease of use of technology, technophobia, the availability of and access to computers and the Internet. An overwhelming majority of these teacher-students (98.4%) declared that they looked forward to using computers better; while 94% considered computers useful for everyday life and 78.5% believed their learners might benefit from using computers (Hendrik D Esterhuizen, Blignaut, Ellis et al., 2012). Thus, intention to use technology was already established, even amongst teacher-students who needed additional computer literacy training. Analysis of teacher-students' perceptions revealed a strong need for support and an enabling environment as preconditions for trust in order to attempt using technology. Once attempts were made to use technology, self-confidence increased together with intentions to persevere towards attainment of techno-competence. SCTE faculty also have the intention to increase the use of TEL in teaching and learning

TEL adoption interventions regarding academic staff and teacher-students of SCTE should not focus on cultivating intentions to use technology, since that has been established. Interventions should focus on the reasons why the intentions to use technology do not result in adoption. Empowerment and support must be addressed. Instead of drastic top-down interventions, such support may be characterised more by unobtrusive pre-emptive support as a result of requirements identified through bottom-up feedback

From Intentions to Adoption

Teacher-students have expressed intentions and commitment to adopt technology in teaching and learning, and these have been confirmed by academics. We suggest that a demonstrated gesture is required from the HEI's management on declared intent. This should be accompanied by tangible commitment to support. However, faculty remain the change agents in technology adoption (Hendrik D Esterhuizen, Blignaut, & Ellis, 2012). While some faculty may welcome such confirmation from university management with enthusiasm or with some

reservation, the obligation to the adoption of TEL will then be established—it will be official. The South African policy on e-Education (2004) demands ICT mastery in teacher training, and formally sanctioned technology use to be implemented across three stages since 2003. Although the target for mature technology integration was set at 2013, little has been accomplished. While faculty may be convinced and some may have tried, without tangible support from university management little progress can be expected from faculty, even if they agree in principle with TEL adoption.

First Steps Towards Interactivity

As a result of technological disadvantage and computer illiteracy on the part of SCTE teacher-students, a second generation distance education model (Taylor, 2001) using printed media dominates learning technology use at SCTE. Hybrid digital versatile disks (DVDs) are included in the study material teacher-students receive through surface mail and bulk short messaging service (SMS) mobile text communication is utilised for administrative arrangements. Teacher-student support at 39 regional contact centres enable teacher-students to regularly engage face-to-face with approximately 350 SCTE facilitators. The thirty seven SCTE faculty regularly travelled to these regional contact centres to engage with teacher-students and facilitators. Since 2010, electronic interactive whiteboards (IWBs) have been installed at regional support centres. By the second semester 2012, two IWBs had been installed at each of the 39 regional contact centres in South Africa and Namibia, enabling SCTE faculty to interact with teacher-students synchronously. Though faculty still occasionally travel to support centres, using IWBs has enabled faculty on campus to train facilitators and interact with the teacher-students at the regional support centres at the same time. Teacher-students may pose questions, write on the IWB at any of these venues and participate in learning experiences. SCTE supplied the Internet connectivity at the centres through four-megabit asymmetric digital subscriber lines (ADSL) subscriptions to enable the use of IWBs to synchronously share learning spaces between these centres and venues on campus.

SCTE teacher-students who are teachers in the process of improving their qualifications need strong encouragement to overcome inhibitions and participate in IWB sessions. Teacher-students expect direct instruction where “teachers provide intellectual and scholarly leadership and share their subject matter knowledge with students” (Anderson, Rourke, Garrison, & Archer, 2001, p. 8) and rarely respond to opportunities to pose questions. Opportunities are available to send questions using SMS before, during or after IWB sessions. This service potentially could contribute to interactivity and provide teacher-students who do not have the courage to ask questions during an IWB session a familiar way of communicating with the faculty and with the group. Concerted efforts should be made to encourage use of the SMS service. Teacher-students at remote locations should be involved by striking a balance between enforced participation in the learning opportunity (and possibly offending them in the process) and perpetuating transmissive teaching styles with minimal interaction. Possibilities such as greater involvement of facilitators in coordination of participatory activities during IWB sessions are currently under investigation. Faculty mentioned time scheduling and the inadequate length of IWB sessions as a limiting factor. Subjects teacher-students enrolled for must each receive allotted time on a Friday afternoon or Saturday. Since large portions of the scope of each topic require discussion, high density information transfer is inevitable and participatory interactivity is an unaffordable luxury as a result of time constraints. If SCTE could improve asynchronous communication so that teacher-student needs could be identified in advance and teacher-students would be better prepared for IWB sessions, and some of these lurking limitations could be minimised. Eventually, asynchronous online learning may address some of these challenges. In summary, SCTE teacher-students require affordable mobile connectivity, adequate Internet access and computer literacy to enable substantial information exchange and collaboration. Faculty need confidence in initiating interactivity, facilitation of online learning and projecting social, cognitive, and teaching presence (Garrison, 2007). Since faculty may be required to participate in online activities after hours, their residential Internet connectivity should receive attention as well. At the same time, SCTE should prepare comprehensively for appropriate TEL implementation, starting with the teacher-students who are in the position to utilise it.

Initial Socially Transformative TEL Integration Framework

The particular adaption of DBR strategy in this research involved five design research cycles collectively comprising one macro DBR cycle. The purpose of this macro DBR cycle is to guide an emergent TEL integration framework, as the culmination of the current research. The recommendations from the DBR cycle should initiate future macro DBR cycles as part of on-going TEL integration towards e-maturity at the SCTE. The five DBR cycles in the current research constituted an initial technology integration framework, quantitative analysis of teacher-students’ computer literacy, multi-methods analysis of teacher-students’ computer literacy learning emotions, multi-methods analysis of faculty’s perceptions during e-learning staff development, as well as the emergent TEL integration framework. The last of these is the focus of this paper.

The authors presented an initial learning technology integration framework for SCTE at the 24th ICDE conference in Bali (Hendrik D Esterhuizen & Blignaut, 2011). It recommended interventions to consider seven aspects prominent for a framework for integration of TEL from pre-existing needs and requirements to a transformed focus on people, education and technology. The aspects are: (i) unqualified and under-qualified teacher-students in the process of upgrading their professional qualifications; (ii) faculty responsible for instructional design of learning material and facilitators responsible for the delivery of the curriculum at remote learning centres; and (iii) the university with its particular vision for teaching and learning. Through DBR analysis of practical challenges in close collaboration with practitioners and analyses of institutional strategic planning and policy, four themes emerged used during interviews with strategic stakeholders. They relate to (iv) the curriculum, (v) information, (vi) access and connectivity, and (vii) learning technologies. The initial framework (Hendrik D Esterhuizen & Blignaut, 2011) expressed the need for interventions, empowered through provision of resources from the HEI. The process depicted in Figure 1 illustrates how each of the aspects is transformed from a socially ascribed before the intervention to a transformed status after administering the intervention.

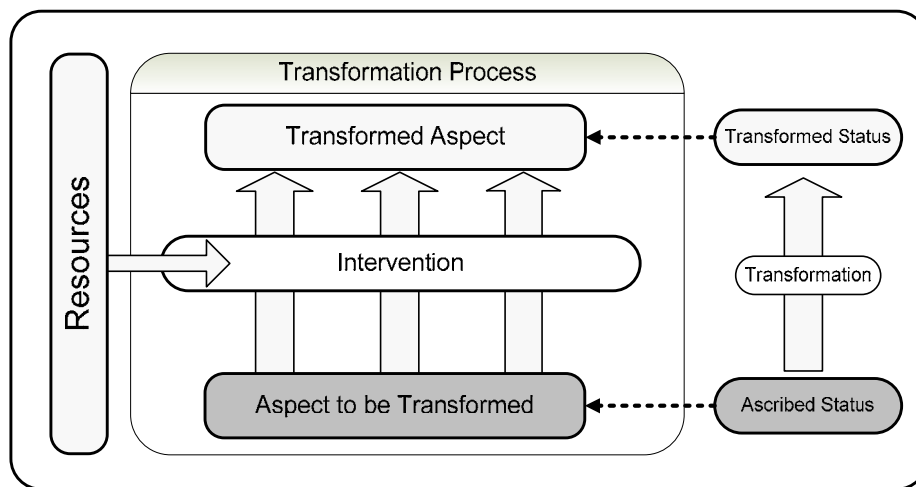


Figure 1: Social transformation of aspects included in the framework through intervention

The first five aspects required people-centred interventions to transform. Interventions requiring intensive logistical and staff input includes initial assessment of computer literacy of teacher-students, followed by tailor-made ICT training at regional tuition centres across Southern Africa. These should go hand in hand with introduction to learner management system (LMS) use, library use, information gathering techniques, study methods, as well as reading and academic writing competencies. Once acceptable computer literacy has been established, it should enable some online and other interactive media alternatives such as mobile learning interventions. It is possible to leapfrog into the use of mobile technologies to achieve learning goals in certain instances. However, the fact that SCTE teacher-students are teachers themselves necessitates conventional computer literacy—computers are found in many schools and prevalent in the world of work. Also, teacher-students should be able to prepare their learners for the computer literacy expectations of commercial, industrial, public administration and higher education environments in Southern Africa.

These interventions would have far-reaching implications, since they require repeated contact sessions over time involving thousands of teacher-students. For practising teachers in deep rural areas, attending such sessions involves considerable effort, and such interventions would be logistically complicated. Due to the wide-ranging computer illiteracy, such sessions should be hands-on. The first phases can especially not be conducted online or asynchronously. Only when teacher-students could confidently navigate LMSs, asynchronous online learning could be attempted. However, inadequate personal access to technology and connectivity limits learning technology adoption, still necessitating paper-based distance education.

SCTE faculty, as the second aspect in the initial learning technology integration framework, display powerful positive group dynamics, consciousness of teacher-student requirements, dedication through a strong work ethic, commitment to development, further qualifications, research and technology adoption. They have expectations of technology mastery and a willingness to learn through experience. Aspects that must be addressed are insufficient time due to excessive workload, unfamiliarity with new technologies, and in some cases perceived technological disadvantage and technophobia. Some consider their computer literacy as inadequate. They request training as first hand experiences both individually and in group settings. In response to the urgent need

for short term solutions, the e-learning manager has started with such hands-on training in 2011, focussing on the use of IWBs and improving faculty confidence in using computers while interacting with teacher-students. Faculty confirmed their appreciation, but requested further training. Practice-based training is needed in the development of skills in using new technologies and focusing on participation and interaction between teacher-students rather than continuous focus on receptive modes of communication (Schneckenberg, Ehlers, & Adelsberger, 2011). Comprehensive training, demonstration and participation in the use of a learner management system (LMS) will be required, since currently LMS use is limited to storage of study guides, study letters and examples of previous examination papers. Though many teacher-students already download material from the LMS, facilitation, collaboration and/or interaction between faculty and ODL teacher-students by means of LMS is not prevalent.

Regarding the institution, curriculum and information as the next three aspects, people-centred interventions include provision of instructional designers and online curriculum implementation initiatives. Overcommitted academic staff members are expected to initiate technology adoption without much institutional support (Blignaut & Trollip, 2003). Faculty should have opportunities to experiment with e-learning techniques, develop skills, acquiring first-hand experience all of which should be informed by research. Faculty should receive real-time support from in-house instructional designers, graphic designers, media designers and information technology assistance. Bold initiatives are needed to invest in human capacity building with instructional design and technology based course curriculum renewal informed by localised research. We consider additional SCTE faculty appointments feasible in relation to the workload, especially in light of the shortage of instructional designers to assist with a transition to online learning. Comprehensive interventions are necessary around instructional design and curriculum and pedagogy design appropriate for online learning focused on optimally engaging learners while using technology. Both faculty and SCTE students need to experience online learning.

Following the preceding discussion, we propose that interventions have preconditions which are determined by internal, external and time dependant factors of which one, two or all three factors may be applicable. Figure 1 indicates resources as preconditions for intervention. Figure 2 shows three classifications of preconditions. If only internal precondition factors exist, intervention is immediately possible without dependence on resources or additional empowerment from outside SCTE. An example in this case would be staff training provided to build academic staff confidence and mastery of learning technology. Examples of external preconditions may involve requesting adequate instructional design assistance from the institution for the 37 SCTE faculty, or requesting sufficient Internet connectivity and provision of open Wi-Fi access to teacher-students at the 39 regional support centres. Such interventions cannot be undertaken without elaborate motivation and university management approval. Possibilities of the Department of Education initiatives or private sector cooperation through investment in furthering teacher training for development may provide Internet connectivity at regional centres, again dependent on external preconditions. Time dependent preconditions may involve processes of consultation and approval regarding external preconditions, or on the other hand could be related to time required for other interventions to bear fruit. Development of e-Maturity will require considerable time. Training is time dependent and must progress in phases where hands-on experience implemented in real application may generate need for more experience as a result of trial and error. In some instances, no interventions may be required and a condition may improve by itself, given enough time.

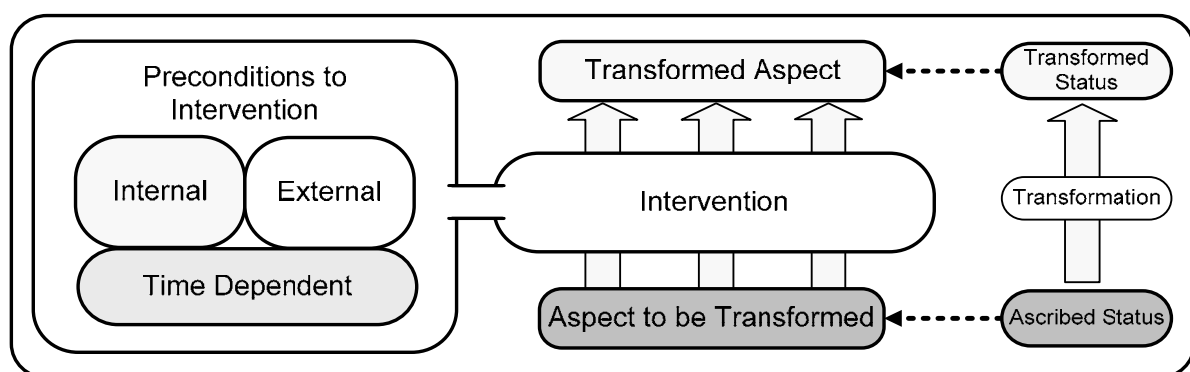


Figure 2: Preconditions to interventions required for transformation

Seamless Pre-emptive Support

Organisational learning includes a process of detection and correction of errors (Chris Argyris, 1976). From error-driven provision of support, we do not expect optimal learning experiences. Reactionary support would be

characterised by attempts to rectify errors in actual outcomes compared to intended outcomes, which implies that mistakes are inevitable to attain some measure of stability. In order to reduce the impact of errors, reaction time must be minimal. Rapid-reaction erratic interventions may result, experienced as uncertainty and instability in learning processes. When reaction time is slow, the effects of unintended errors are aggravated. Ideally, provision of support towards pleasurable learning experiences should be informed by latent requests of participants. The unuttered requirements should guide pre-emptive support provision. In addition to feedback, feedforward algorithms are needed in design processes to provide stable control of learning experiences. Seamless support should sustain learning enhanced through technology, based on bottom-up driven requirements built into timeous planning of empowerment and provision. This progressive approach to provision of support in response to requirements has elements of the double-loop learning principle and Deutero-loop learning where the learning process itself is examined and improved upon (C Argyris & Schön, 1978; Bateson, 1979). Seamless pre-emptive support through a strategy containing forward-looking top-down interventions as well as bottom-up initiatives listening to latent unuttered requirements must provide an effortless travelling experience to participants crossing the digital divide.

Participatory Staff Training as DBR Intervention

The e-learning manager facilitated training where small groups of SCTE faculty interacted informally with one another between different IWB venues without being connected to remote sites. They took turns in leading the discussion based on learning content displayed simultaneously on the IWBs in the venues on campus. With only colleagues present, they attempted to use an IWB to manage a computer while establishing a collaborative learning atmosphere with participants in multiple locations, initially in a non-threatening environment. In this way, SCTE's faculty obtained confidence in basic use of IWBs through informal participatory practice sessions. Since the beginning of 2011, practice sessions like these had been interspersed with formal scheduled sessions of interaction with SCTE teacher-students at the regional support centres using IWBs. These cycles of training and lecturing/facilitation provided confidential opportunities to learn and develop IWB practices, experience challenges and devise solutions while support is available. Opportunities for on-going research as part of future macro design research cycles may refine solutions, methods and design principles. This paper regards these cycles as part of long term components of the framework. In line with the approach of providing seamless support, the aim is to pre-empt people-centred requirements for TEL and minimise uncertainty and anxiousness from the perspective of faculty. Though uncertainty may result due to the complex nature of people-technology interaction, protracted frustrations should be avoided. Occasional unintended errors should only serve to build faculty confidence in coping with limited levels of uncertainty and seamless support should prevent prolonged instability.

Initially when SCTE faculty start using synchronous computer mediated IWB conferencing, tendencies are for them to lecture blindly using PowerPoint™ slides, occasionally writing onto the slides presented through an IWB to emphasise important aspects, interspersed with occasional questions to the teacher-students at the remote sites. Instructivist teaching methods characteristic of transmissive teaching styles dominate. Cultivating interactive lecturing requires practice, and an on-going professional development programme for faculty is crucial. Interventions should in time transform faculty to foster creativity and enable learning content and curriculum transformation as “educators’ roles are changing from managing content to connecting learners in new ways to other learners, resources, and expertise” (Schwier, 2010, p. 91).

Interventions such as staff training combined with observation of IWB sessions were essential activities in the development of solutions in iterative cycles of testing and refinement during the DBR cycles. During these, *design principles* were produced to enhance solution implementation in practice, enabling *refinement of problems, solutions, methods and design principles* (Herrington, McKenney, Reeves, & Oliver, 2007; Reeves, 2006).

Introducing Asynchronous Online Learning

Interconnected IWB communication can introduce SCTE teacher-students in remote areas to online learning in the near future. We have to demonstrate online learning in IWB synchronous mode to facilitators and teacher-students using hands-on step-by-step procedures to build confidence to attempt using LMS interaction in asynchronous mode, away from assistance of faculty and facilitators. A precondition would be improved Internet bandwidth at regional support centres to facilitate teacher-students’ Internet access while still maintaining sufficient bandwidth for continued synchronous computer mediated IWB conferencing. Apart from requirements for facilities, an important precondition in this context is that faculty should have proficiency in interacting with teacher-students on a technical level. This may require much more techno-proficiency than interacting around non-technical teacher-training subject content. Intensive participatory staff training should transform faculty to required maturity in these contexts. We intend to provide seamless support in these areas as

well. Faculty should perceive their competencies developing with minimum inconvenience necessary in acquiring unconscious competence (Jung, 1990) through repetitive practice, building on confidence acquired in other related areas.

Analysis of SCTE teacher-students' emotional responses during computer literacy training data indicated that "wide-ranging uncertainty and fear emerged and revolved from gratefulness, expectation and engagement to confidence as a result of hands-on training with patient and caring facilitators" (Hendrik D Esterhuizen & Blignaut, 2011). This finding relates to the opinion of Kort, Reilly and Picard (2001). When positive emotions dispel negatives after successful interaction with technology, Davis and Wong (2007) translate this as the flow experience between challenge and skill. Technology adoption with teacher-students could be stimulated with interventions based on exposure to technology (Moolman & Blignaut, 2008) and promoting accomplishment.

Promoting accomplishment during exposure to technology would build confidence in SCTE teacher-students, faculty and facilitators. Asynchronous online learning would enable interaction through TEL once preconditions allow necessary interventions and seamless support to become effective.

Examples of DBR Cycle Detail in Practice

Early in 2011 the dominant electronic learning technology at SCTE was synchronous computer mediated conferencing using IWBs. Faculty used IWBs during scheduled sessions. It was imperative to observe SCTE academic staff during interaction with IWBs and evaluate quality of both academic facilitation and technology mastery. These aspects had to be addressed instantly and they represented a DBR cycle involving analysis of practical problems by researchers and practitioners in collaboration (Herrington *et al.*, 2007; Reeves, 2006). Testing and refinement of developed solutions in practice involved human perspectives as well as technology adaptations at a level of complexity typical when people interact with technology.

On the one hand, faculty had to communicate with multiple remote locations. Classrooms may be noisy environments, filled to capacity with teacher-students who needed to hear clearly while viewing what was being displayed on the IWBs. Communication is in English, which in most cases is not the home language of either faculty or teacher-students. Implemented technology solutions included optimising efficient communication, cost-effectiveness and reliability including head-worn wireless microphones for faculty and compressor-limiter audio dynamics processing. Audio mixers with USB interfacing were installed at the IWB venues on campus to enable controlling audio feeds to the remote sites. When faculty wanted to include multimedia objects during IWB sessions, the audio mixers enabled feeding the audio from the computer to the remote sites in addition to the microphone feed of the faculty. Mixers also allowed optimising speech spectrum equalisation by emphasising the 2 kHz octave and reducing gain at low frequencies for improved speech intelligibility. Mixers also allowed uncomplicated manual control to improve intelligibility at the SCTE location when teacher-students asked questions at remote sites in non-ideal acoustical environments. The detail of interaction in practice between technology and faculty, communication and learning experiences, ease of use and usefulness, features and simplicity, all result in appreciating the necessity of a design-based research approach.

Initially, the IWB venues on campus utilised laptops and free standing projectors. The temporary nature of wires connecting the equipment and a tendency to borrow loose standing equipment reduced reliability. Free standing projectors meant that bumping the table required calibration of the projector in relation to the IWB before continuing. Installing projectors permanently and installing computer boxes hard-wired to the access points and peripherals improved the permanency of installations, and as a result the reliability and repeatability of IWB use.

On the other hand, faculty required uncomplicated procedures in using IWBs in order to reduce anxiety and enable them to focus on the teaching and learning experience. The training they required had to instil confidence while cultivating unconscious competence in using technology (Jung, 1990). At the same time, some lecturers perceived themselves as in need of improved computer literacy.

Since e-learning support staff is available at the SCTE but not at the remote sites or where IWB venues are situated at other NWU campuses, indiscriminate duplication of technical facilities as used at SCTE at all IWB remote venues is not feasible. When manually operated electronic mixers are installed where experienced e-learning support staff are not available, the possibility of users adjusting the myriad of control knobs creates unpredictable results and unreliable operation. Outcomes of DBR exercises during this study involving IWB and ancillary equipment with enhanced features are that programmable audio processing and matrix switching equipment is being installed in the eight IWB venues at SCTE at the end of 2012. Using internally programmable facilities would enable processing to be automated. Matrix switching would allow scenario choices to be simplified for IWB users in the absence of e-learning support staff with advanced technical

knowledge. Users only have to choose icons on a control panel and the equipment automatically chooses combinations of required settings. The ability to access and re-program such equipment remotely over the Internet would simplify updating programmed settings at remote IWB venues in future. Programmed processors cannot haphazardly be re-adjusted by users in the absence of support staff.

The complex nature of teaching and learning using electronic technology is aptly illustrated during the entire process of training interspersed with practical application. Observation of faculty using IWBs enabled the development of training opportunities, and the collaboration process produced refinement of solutions in practice regarding human factors and technology affordances. Discussions, observations, as well as structured and open-ended questions in training evaluation surveys contributed to evolving strategies for training and support. Within the space of a few months faculty attained confidence in interacting with teacher-students across Southern Africa in synchronous computer mediated IWB conferencing. High levels of technological reliability resulted and ease of use stabilised. Aspects of interactivity could still improve and pedagogical issues are still under consideration. Through seamless support, the self-confidence in users of technology in teaching and learning can be instilled, not by perpetuating anxiety but by exposure to technology and promoting accomplishment.

These examples illustrate the nature of urgent interventions required at the beginning of 2011. While similar detail of other aspects cannot be provided here, much has also transpired regarding other aspects included in the framework.

Process towards an Emerged TEL Integration Framework for NWU

The specific nature regarding the adaptation of DBR involved the limitation of using design cycles addressing only one macro design cycle, and not an extended series of macro design cycles. The recommended TEL integration framework which is the outcome of this macro DBR cycle is intended to be the input to future macro DBR cycles, not part of the current endeavour. The framework should objectively address urgent short term requirements through interventions and solutions developed as a result of analysis of practical problems during close collaboration between the researcher and practitioners. The actions performed during the inquiry informed subsequent interventions which in turn built on what had happened previously (Van den Akker *et al.*, 2006). If DBR methods are derived from the definition of the research problem in close collaboration with practitioners and fine-tuned through literature, what is already known about the problem becomes clear and guide the development of potential solutions. The inquiry that forms the basis of DBR helps the researcher to understand the underpinning processes and variables (Van den Akker *et al.*, 2006). The research towards a framework for integration of TEL in ODL was a commitment to pragmatic strategy aiming to be functional:

Thus, pragmatists decide what they want to research, guided by their personal value systems; that is, they study what they think is important to study. They then study the topic in a way that is congruent with their value system, including variables and units of analysis that they feel are most appropriate for finding an answer to their research question (Tashakkori & Teddlie, 1998, p. 26).

According to Maxcy, pragmatism is Peirce's (1966) contribution to research methodology and his position has three ingredients: (a) the acceptance of reality; (b) the role of the future as the space within which things may be known; and (c) a purport, or a commitment to purposive action, following a plan with an end or highest good (Maxcy, 2003, p. 67). Methodological pragmatism, “proposes that pragmatism itself be conceived either as (a) a method for selecting inquiry methods or (b) a method of inquiry itself, broadly conceived. As such, methodological pragmatism has a weaker and stronger version” (Maxcy, 2003, p. 81). Our research position in developing the framework is *methodological pragmatism* as a method of inquiry.

As e-learning manager, the first author have been in constant close collaboration with academic and support staff of SCTE as well as university management and role players in technology planning, provision, support and logistics. The following diagram (Figure 3) provides an explanation of the overall process of development of the Emerged TEL Framework through an adapted DBR process, resulting in five research papers of which this paper is the last. Analysis of practical problems in relation to the perspectives of the institution as well as the teacher-students and faculty, contributed to the initial framework (1 Initial Framework: Figure 3), the focus of the first research paper (Hendrik D Esterhuizen & Blignaut, 2011). Analysis of SCTE teacher-students' perceived computer literacy competencies (2 Student Computer Literacy Analysis: Figure 3) resulted in the second research paper (Hendrik D Esterhuizen, Blignaut, Ellis *et al.*, 2012), which contributed to the Initial Framework. During this stage, the need emerged to analyse affective responses of SCTE teacher-students (3 Computer Literacy Learning Emotions: Figure 3), resulting in the third research paper (Hendrik D Esterhuizen, Blignaut,

Els, & Ellis, 2012). The fourth research paper (Hendrik D Esterhuizen, Blignaut, & Ellis, 2012), followed after a series of DBR cycles where interventions and solutions recommended in the Initial Framework were applied and analysed. The paper (4 Faculty Perceptions during e-Learning Staff Development: Figure 3) resulted from analysis of longitudinal observations of SCTE faculty during technology use while requiring assistance and training. The data gathered through observation was compared with data from interviews, discussions and responses to questionnaires and a survey. The DBR cycles of all these research papers contributed to this paper (5 Emerged TEL Framework: Figure 3).

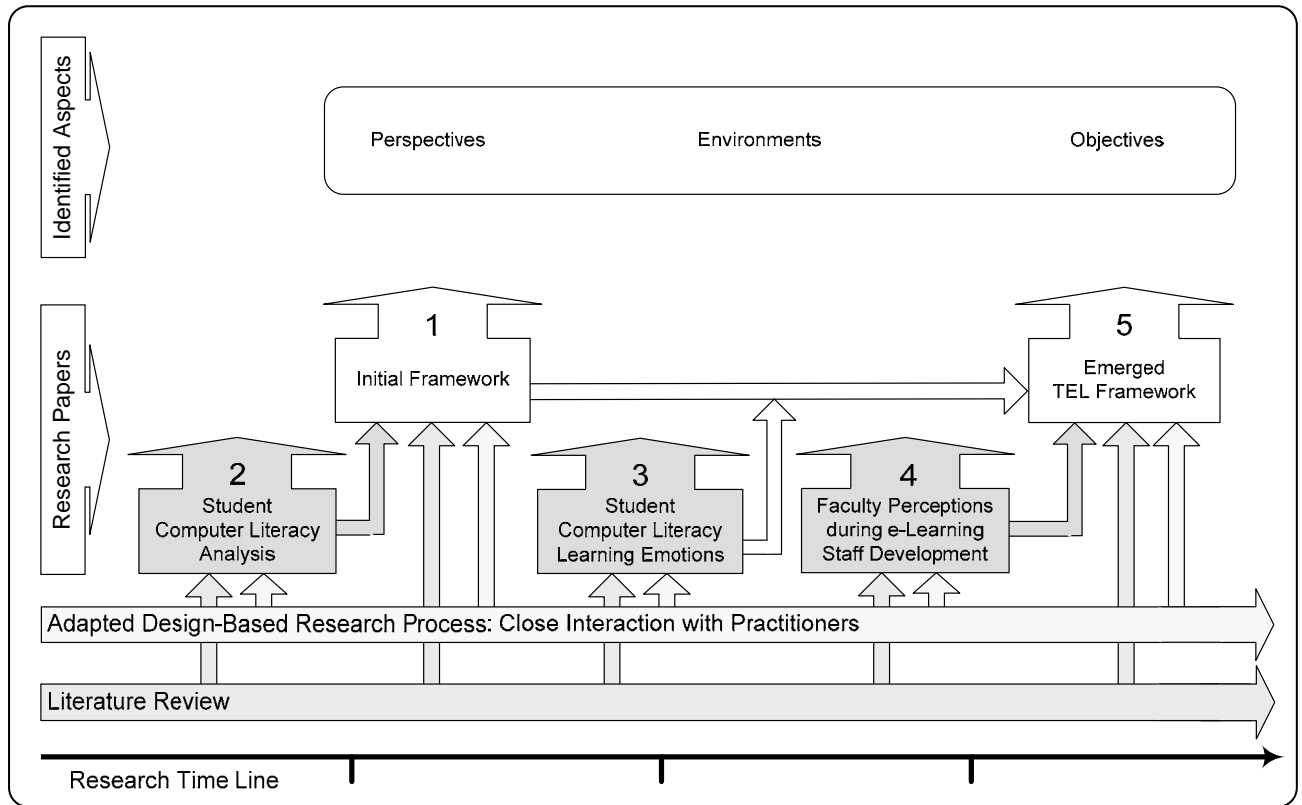


Figure 3: Development of the Emerged TEL Framework through an adapted DBR process resulting in five research papers

The process of developing a framework for the integration of TEL in ODL at NWU involved identifying aspects to include in the framework and recommendations on how to address these identified aspects. During the evolvment of the initial framework (1 Initial Framework: Figure 3), seven prominent aspects emerged. The researchers evaluated perceptions of teacher-students and faculty as the first two aspects included in the framework in relation to their experiences with learning technology as presented by the university as institution. It became clear that complex relationships exist between the aspects themselves as well as in relation to perspectives they have on strategies, policies and practices in the university as institution. While it was possible to examine perspectives of each of the other five aspects towards the strategies, policies and practices in the university, this has not been done yet. A possibility would be examining the relationships between the curriculum and the Teaching and Learning Strategy of the university pertaining to TEL. Is there harmony between the requirements of promoting learning enhanced by technology and the Teaching and Learning Framework from the perspective of the curriculum? Does development of infrastructure at the university allow reaching the aims of the Teaching and Learning Strategy in terms of TEL from the perspective of the curriculum? Thus, the aspects emerging in the initial framework represent *Perspectives* in the Emerged TEL framework (5 Emerged TEL Framework: Figure 3). The *Environments* were the aspects through which empowerment were to be provided from the university to reach the *Objectives* in Figure 3.

Why Necessarily a Framework?

Reporting on learning technology integration could be presented at numerous levels: As a presentation to management accompanied by a written report, delivering the findings as a research report, technical recommendation, treatise, motivated strategy, and training course, publishing the findings as a blog or web site, a tool or simply as guidelines. Using a framework was justified. There were (i) significant identifiable existing

uncertainties, (ii) clear short term requirements for action, (iii) possibilities to address uncertainties through distinct interventions, (iv) a need for continuation of effort and persistence during intermediate phases of transition where (v) proceeding actions are dependent on evolving perceptions, maturing attitudes and commitments. Framework indicators and milestones could enable (vi) assessment of initiatives and evaluations of performance target attainment and (vii) reflection and research to perform cyclic review of long term goals. Since it was unlikely that involved procedures and intricate interventions would stay the course if left to individual people's aims and personal views, a comprehensive framework which would transcend personal whims and integrate efforts and investments seemed an appropriate choice. Well documented strategies systematically evaluated could enable research and reporting to share results with the education community and outlive individual personalities to contribute to an enduring institutional consciousness. While this paper cannot accommodate comprehensive detail of the framework, the main aspects and how to address these follow.

Emergent TEL Integration Framework

The focus of this paper is *Technology Enhanced Learning in Open Distance Learning at NWU* emphasising support as a precondition to adoption. Relationships between objectives, environments and perspectives are examined using an adapted DBR approach where solutions to practical problems are developed through close collaboration between practitioners and researcher.

The framework to integrate TEL in ODL at NWU is not a static recipe, but involves a dynamic process. The current state of the framework is the result of one macro DBR cycle that emerged after a series of design-based research cycles, aimed at determining short term, medium term and long term requirements and solutions to these. Urgency in addressing short-term requirements through interventions required that research and development occur simultaneously. This paper is the last cycle from the process. The framework will evolve continuously and constant interaction between objectives, environments and perspectives will determine new short term goals at any given point. Revised requirements will require new interventions with new time scales. Medium term and long term objectives could be tentative, but priorities from each perspective will be towards the highest good through methodological pragmatism at the time.

Characteristics of the framework are (Figure 4):

1. Aspects consisting of three groups comprising *Objectives*, *Environments* and *Perspectives* which guide TEL integration.
2. New TEL integration initiatives could conceivably be introduced from within any aspect in the groups of *Objectives*, *Environments* and *Perspectives*.
3. Consideration of *People* takes precedence over consideration for *Technology*.
4. Primary *Objectives* should be chosen and interpreted in relation to *Environments*, to determine validity and to be sanctioned and guided according to the HEI.
5. Remaining *Objectives* may become secondary objectives, requirements or outcomes.
6. *Support and Empowerment* are required to reach *Objectives* for adoption of TEL.
7. Examining intended actions and TEL integration strategies from each of the *Perspectives* or initial DBR cycle investigations should reveal requirements through *Environments* which prevent meeting *Objectives*.
8. All *Perspectives* must be considered, but first *Students*, then *Faculty* and lastly *Learning Technologies*.
9. Interventions and seamless support should be developed through DBR approaches.
10. Preconditions to interventions could be *Internal*, *External* and *Time Dependent*.
11. To provide *Seamless Support*, early indications of latent requirements should be utilised and implemented as pre-emptive support to minimise inconvenience to participants
12. TEL integration maturity classification phases to evaluate progress in each of the aspects include five phases ranging from Phase 0 (Unrecognised) to Phase 4 (Regenerative).
13. Every aspect from the three groups *Objectives*, *Environments* and *Perspectives* could be classified at a different maturity classification phase as stratified maturity.
14. DBR analysis of practical problems in close collaboration with practitioners will inform future revisions of each TEL aspect as well as the overall process.

People–technology interactions in teaching and learning, determined by objectives to the highest good within environments from the various perspectives, have complex relationships. Approaches are determined in close collaboration and in priority order from the perspectives of teacher-students and faculty, taking into account all relevant perspectives to reach objectives within given environments.

The following diagram (Figure 4) illustrates the three groups: *Perspectives*, *Environments* and *Objectives* and the interaction between these groups of aspects. In line with the approach of this paper, the requirements for

Support and Empowerment should guide any route of association between these three groups. The nature of *Seamless Support* should be determined taking cognisance of latent requests of participants during the earliest possible design cycles, while attempting to negotiate linearly through the route from *Perspectives* to *Consequences*. If an attempt to initiate *Technology Interaction in Teaching and Learning* starts with any of the aspects in one of the three groups, navigation through the diagram must be done with consideration of *People* taking precedence over consideration for *Technology*. Suitable *Support and Empowerment* are required to reach *Objectives* in the last group in the diagram. *Environments* guide implementation and determine boundaries, compliance and required *Support and Empowerment*, resources and provision. After required *Seamless Support* for each of the *Environments* is established, the process may be negotiated by starting from any of the aspects in any group. Verification would then be possible of optimally reaching *Objectives* resulting in intended *Consequences*.

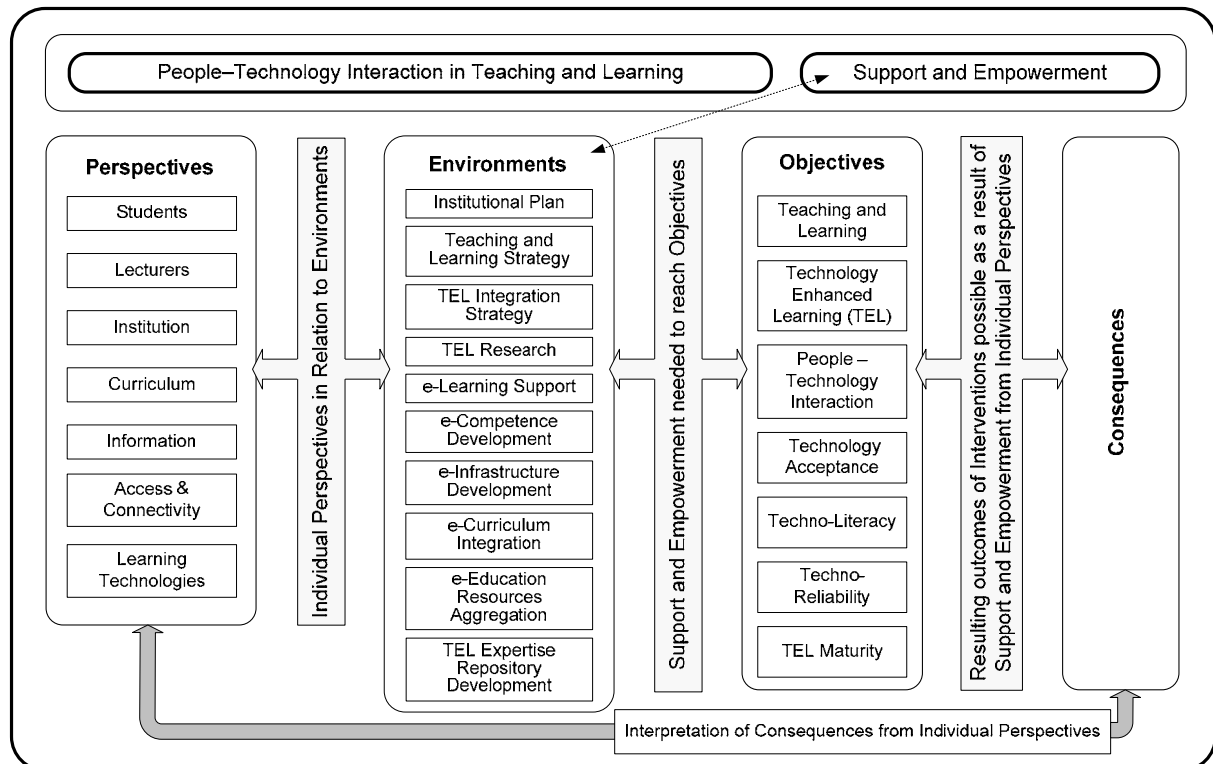


Figure 4: Complex relationships exist in support and empowerment required for optimum interaction between people and technology in teaching and learning

To initiate Technology Interaction in Teaching and Learning

Consideration of preferred sequences to reach *Objectives* within relevant *Environments* will determine actions. Good practices involve cognisance of *Support and Empowerment* needed for successful interaction between people and technology for teaching and learning from applicable *Perspectives*.

As an example: Faculty want to initiate asynchronous online learning in a module common to many courses involving introduction to research principles. It is important to consider to which extent each of the *Objectives* is applicable. It would be wise to start by aiming for the *Teaching and Learning* outcomes most appropriate for the intended module. As the most relevant and primary *Objectives* are isolated, other *Objectives* may become requirements or outcomes. In this example *Techno-Literacy*, *Techno-Reliability* and *Technology Acceptance* are requirements, while *TEL*, *People–Technology Interaction* and *TEL Maturity* are secondary outcomes. Now, *Environments* should provide sanction and determine boundaries, compliance and required *Support and Empowerment*, resources and provision. All this will be determined by each of the *Perspectives*. In this example, if the *Objectives* are sanctioned by the *Institutional Plan*, *Teaching and Learning Strategy*, *TEL Integration Strategy* and supported by *TEL Research*, successfully implementing the asynchronous online learning research module would need *e-Learning Support*. It would both require and contribute to *e-Competence Development*, *e-Infrastructure Development*, *e-Curriculum Integration*, *e-Resources Aggregation* and *TEL Expertise Repository Development*. From the *Perspective* of *Access and Connectivity* and *Learning Technologies* it would not be able to implement the endeavour without required *e-Infrastructure Development*. If any of these aspects fail to meet required performance within applicable *Environments*, more interventions and

seamless support would be required. If the preconditions for the interventions are *Internal* and *Time Dependency* is within requirements, the intervention may be initiated and once the aspect has been transformed to requirements the intended enterprise could proceed and be concluded for the present *Objectives*. At that time, continuing DBR cycles would inform new short term, medium term and long term requirements and solutions. Initially, primary *Objectives* would determine short term, medium term and long term *Objectives*. Long term objectives should always include TEL integration maturity at the highest level and must be aligned with the *Institutional Plan* and *Teaching and Learning Strategy*.

Seven aspects were included in the initial framework (1 Initial Framework: Figure 3): *Students, Faculty, Institution, Curriculum, Information, Access and Connectivity* and *Learning Technologies*. These are now represented as the group *Perspectives* in Figure 4. In the *Initial Framework*, interventions were suggested for each of these. Some of these interventions were inter-related and progress depends on sequences determined by other processes or commitments and discussions around policies. Some interventions were possible without *External Preconditions*, others not.

At the beginning of 2011, we had already analysed the SCTE student computer literacy survey results (2 Student Computer Literacy Analysis: Figure 3). We recommended that new teacher-students should be evaluated and where needed computer literacy should be developed as intervention consisting of participatory hands-on tailor-made ICT training at regional tuition centres across Southern Africa. Introduction to learner management system (LMS) use, library use, information gathering techniques, study methods, and reading and academic writing competencies should also be included as interventions. These interventions have considerable preconditions.

The e-learning manager started with hands-on faculty training in 2011 focussing on the use of IWBs and improving faculty confidence in using computers while interacting with teacher-students. Through seamless support, he aimed at introducing faculty to synchronous computer mediated IWB conferencing in such a way that their anxiety about technology use could be quelled. Ensuing scheduled IWB sessions provided opportunities to build faculty confidence while determining usability, efficiency and reliability of technology, student reaction and observing unintended consequences. Adaptations to presentation, scheduling, technology and communication continued as research and development were performed simultaneously. Any changes in the conditions or circumstances influencing one or more of these aspects influenced the others in various ways. Close collaboration contributed to developing solutions and produced design principles needed to address these. Faculty utilised continuous opportunities for participatory staff development, exploring new avenues developed through experience garnered during every series of scheduled IWB sessions. Survey responses of faculty during training confirmed commitment and renewed requests for more training (Hendrik D Esterhuizen, Blignaut, & Ellis, 2012).

Internet connectivity is crucial and could be jeopardised in many ways. These included power outages, university network reliability and availability of information technology support after hours or over weekends, external network reliability, cloud server reliability and local conditions at each of the regional support centres. Successful learning experiences require optimum performance on the part of each of these aspects. While problems with connectivity or technology resulted in intensified measures to increase redundancy and minimise reoccurrence, in real terms very little interruption to IWB sessions resulted. Some teacher-students travel great distances with considerable effort to attend these sessions, so interruptions should be avoided at all costs. In the event that IWB sessions cannot continue, facilitators at regional centres can provide alternative support as well.

Changing technological conditions directly influence staff training. Attempts to draw up formal procedures in using technology and expecting staff to memorise these while changes are being effected in technologies are not productive. During the period from early 2011 to mid-2012, all computers on campus changed the operating system version from Windows XP to Windows 7, several changes in software versions transpired regarding IWB software, and various other computer programs and logon procedures for staff members changed. Preferred practices need to be updated continuously. Faculty have to adapt continuously and learn not to memorise procedures, but develop technological intuitiveness. Technical assistance must be readily available at all times.

The complex interaction between and among *Perspectives*, *Environments* and *Objectives* is illustrated in Figure 5. Considering aspects such as the *Curriculum, Information, Access and Connectivity* and *Learning Technologies* as having their own *Perspectives* may be confusing to some. However, looking from the perspective of technology at *Environments* reveals either accommodating or inhibiting relationships, depending on the characteristics of the technology, the particular environment and the intended *Objectives*. Interaction between perspectives as well as interaction between environments may improve or hinder the measure of

harmony from the perspective of each. Possible interventions or pre-emptive support may facilitate interaction. If such facilitation is not possible, revision of *Objectives* could be required or unintended consequences will result. Looking at *Environments* from the other *Perspectives* will confirm or reject possibilities of intervention and support in each case.

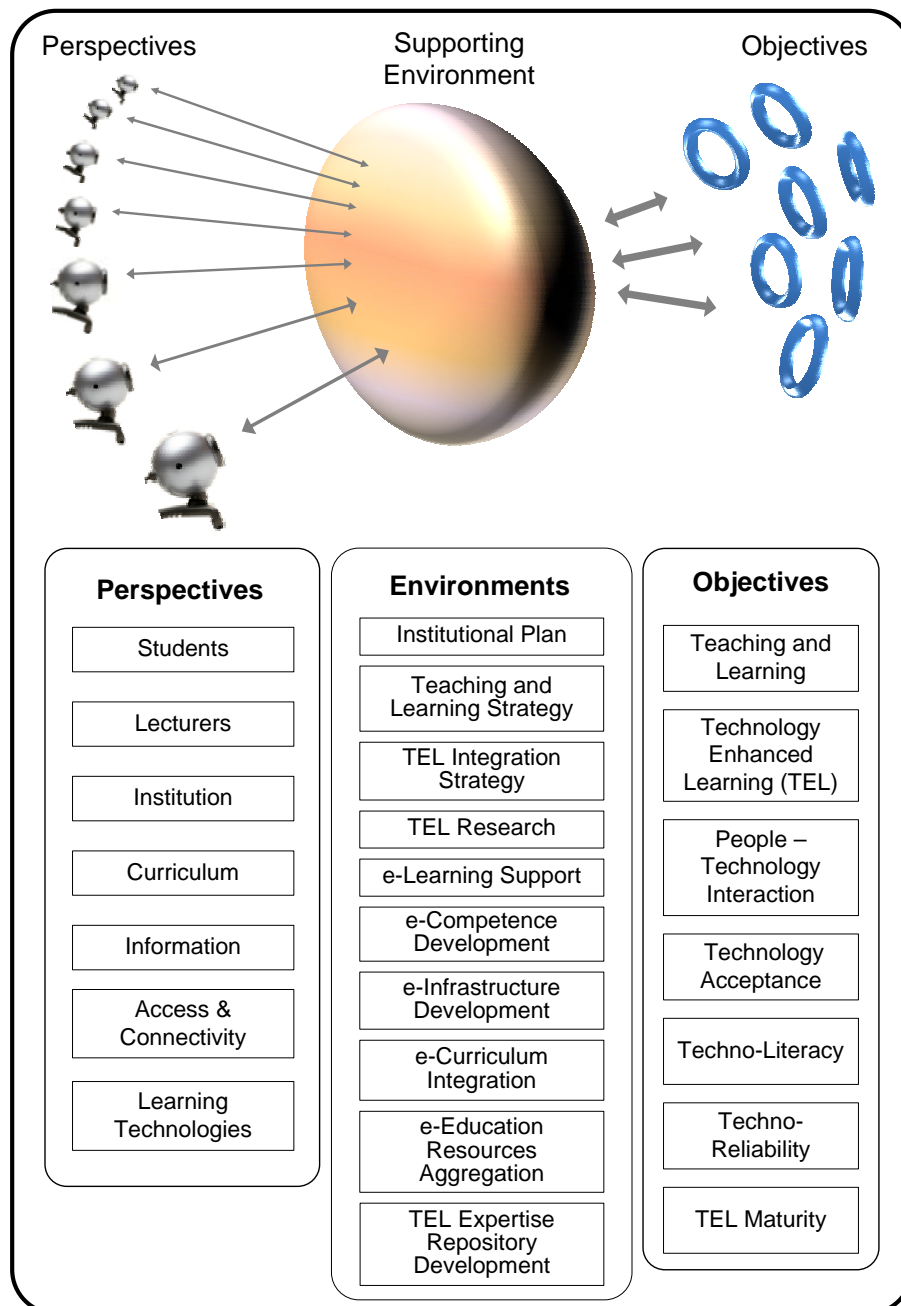


Figure 5: Interaction between Perspectives, Support, Environments and Objectives

A framework for the integration of TEL should inform the interactions between learners, faculty and learning technology. Scanlon (2010) quotes Issroff and Scanlon (2002) in saying that they “distinguish between two groups of theories in use in work with learning technologies. The first are related to ‘principled decisions about the design of learning materials’ and the second are used to ‘influence the way we frame our research on learning’. They argue that both types of work are necessary to research learning in relation to technology. What we require as educational technologists are theories which provide a framework in which we can understand the complex interactions between learners, teachers and the resources they use” (Scanlon, 2010).

Experience in synchronous computer mediated IWB conferencing and perceptions of teacher-students and staff to date provides glimpses of uncertainties and variableness which may constantly require management as SCTE teacher-students increasingly begin to adopt TEL. The framework includes elements of recently acquired

experience, and impressions of present localised requirements projected into expectations of future requirements. Much of the framework is based on imminent requirements to prepare for the present and near future. Medium term and long term solutions and design principles should evolve through future DBR cycles. Overall medium and long term requirements will always include building and increasing TEL maturity.

Maturity Determination

Wenger (1998) used five types of relationship defining the acceptance that an institution might have in moving toward adopting the concept of a learning community. These inspired suggested stages for classifying maturity in TEL at NWU for the purpose of this framework (Table 1).

Table 1: TEL integration maturity classification phases

Classification of TEL integration maturity	Characteristics evident in TEL integration maturity which may determine which phase is applicable
Phase 0 Unrecognised: There is a lack of awareness of the value of the concept, or... Obscured: The concept is visible informally to a circle of people (Bootlegged)	In some instances resembling the current TEL maturity level: Perceptions are still prevalent that online learning only involves making available text-based learning content on the internet as downloadable files, PowerPoint presentations or lectures, copying face-to-face instruction methods. The ability to clearly define e-Learning and re-use or design and produce learning objects eliciting participation in learning is lacking
Phase 1 Legitimised: The concept is officially sanctioned but may be over managed and under scrutiny	Reached when participants are aware of implemented TEL support initiatives. Enthusiasm to develop TEL activities in faculty subject areas grows. Staff should feel encouraged to spend time experimenting with learning objects introduced to students. Social communication tools become exciting to use. Benefits are discovered in learning technology utilisation for students. Faculty change from dictatorially managing content to being facilitators connecting learners in new ways to other learners, resources, and expertise: From being <i>the sage on the stage</i> to <i>the guide on the side</i>
Phase 2 Strategic: The concept is widely recognised as central to the organisation's success	Assessment and research undertaken by academic staff confirm successful adoption of TEL to the extent that learning experiences exceed those obtainable through face-to-face delivery of teaching. Interaction between learners, content and teachers become reciprocal though successful teaching presence, social presence and cognitive presence
Phase 3 Transformative: The concept is able to be redefined	Mature learning culture emerging from established interaction with students through socially constructed learning communities enables authoritative expansion into distant education markets with similar requirements. Research and peer review acknowledge attainment internationally
Phase 4 Regenerative: The redefined concept matures to a level of reproduction as a result of its own vitality	The unique learning culture emerging from localised indigenous experiences enriched by internationalisation develops abilities to reproduce in other contexts. It grows and starts to initiate self-sustaining results

Each of the aspects shown in Figure 5 may develop in maturity as a result of support through interventions. TEL integration maturity for each aspect may at a given moment be different from that of the other aspects. Each could be classified at a maturity level according to the phases suggested above. In this way, for each aspect stratified classification may enable development of solutions informed by applicable design principles and technological innovations followed by iterative cycles of testing and refinement of solutions in practice (Herrington *et al.*, 2007; Reeves, 2006). In this way, interventions and required support could be determined through continuing DBR cycles.

Main Aspects not Included in the TEL Integration Framework

This framework is not focussed on evaluation of cost-effectiveness; cost of ownership; and drivers and benefits of using technology in teaching and learning for the following reasons:

- The current e-maturity state of the distance students at SCTE necessitates far-reaching measures and estimates of success in such strategies will be premature.

- The level of commitment and support forthcoming from university management and the resulting impact on technology adoption will have to be evaluated before realistic cost-effectiveness and cost of ownership estimates can be meaningful.

In this paper, we emphasize the need for support from HEI management in the implementation process. Support from HEI management will determine the success of technology integration at NWU. At SCTE, teacher-students as well as faculty have the intention to adopt technology in teaching and learning.

PRIORITIES TOWARDS THE INTEGRATION OF TEL IN ODL AT NWU

The institution should commit to a comprehensive TEL integration strategy displaying a declared intent with visible actions. This will mark Phase 1 in institutional TEL integration maturity classification. This strategy should evolve from the bottom up by inviting schools within faculties to collaborate and contribute to their own TEL strategies. At the same time, top-down empowerment should demonstrate intent through visible commitment. Legitimised TEL strategies as a result of Phase 1 initiatives in relevant environments may over time contribute to visible curriculum maturity where technology is of strategic importance, integrated into core elements of the curriculum and not added on. Information TEL integration maturity classification in Phase 1 would be valid when students are required to demonstrate competency in information gathering, classification and utilisation.

Successfully concluding Phase 1 in institutional TEL integration maturity should result in Phase 1 faculty TEL integration maturity once faculty become aware of implemented TEL support initiatives. Enthusiasm to develop TEL activities in faculty subject areas is growing. Staff feel encouraged to spend time experimenting with learning objects introduced to students. Social communication tools become exciting to use. Benefits are discovered in utilising learning technology for students. Faculty change from dictatorially managing content to being facilitators connecting learners in new ways to other learners, resources, and expertise: From being the *sage on the stage* to the *guide on the side*. On the part of faculty, responsibilities for adoption should remain focused on teaching and learning, pedagogical requirements, and promoting cognitive presence, social presence and teaching presence in communities of inquiry. In a non-threatening environment using social networking the e-learning manager intends to instil self-confidence in faculty as well as students, not by perpetuating anxiety but by exposure to technology and promoting accomplishment.

Since SCTE had to arrange Internet connectivity at regional tuition centres to enable the use of IWBs for synchronous computer mediated IWB conferencing, provision of Internet connectivity through Wi-Fi to students and facilitators at these centres will enable small-scale e-Learning projects to be initiated. Saturation will soon be reached, however, since the bandwidth available at present will not be sufficient for large-scale use of Internet facilities by students. Meticulous arrangements may be required, such as limiting bandwidth availability to coincide with IWB sessions. This may lead to other complications since the bandwidth needed for the IEW sessions may be drained by student use. Lasting solutions would include proper provision of Internet at all regional tuition centres.

In this way, initial steps may establish Phase 1 maturity in each of the relevant aspects. It will be possible to reach advanced maturity with commitment, support and empowerment.

CONCLUSION

Seamless support should weather the raging waters that demotivate and provide a safe travelling experience, while bridging the divide, towards confident participation in the knowledge society. Support from university management will determine the success of technology integration at NWU. At SCTE, teacher-students and faculty both have the intention to adopt technology in teaching and learning. Responsible planning, commitment and execution on the part of university management will enable these intentions to result in adoption.

REFERENCES

- Aguti, J. N., Banks, F., Downes, T., & Henderikx, P. (2010). *An international evaluation of the SCTE distance education provision*. Potchefstroom: North-West University.
- Anderson, T., Rourke, L., Garrison, D. R., & Archer, W. (2001). Assessing teaching presence in a computer conferencing context. *Journal of Asynchronous Learning Networks*, 5(2), 1-17.
- Argyris, C. (1976). Single-Loop and Double-Loop Models in Research on Decision Making. *Administrative Science Quarterly*, 21(3), 363-375.
- Argyris, C., & Schön, D. (1978). *Organizational learning: A theory of action perspective*. Reading, Mass: Addison Wesley.
- Barab, S., & Squire, K. (2004). Design-Based Research: Putting a Stake in the Ground. *The Journal of the Learning Sciences*, 13(1), 1-14.

- Bateson, G. (1979). *Mind and nature: a necessary unity*. New York: Bantam Books.
- Beller, M., & Or, E. (1998). The Crossroads between Lifelong Learning and Information Technology: A Challenge Facing Leading Universities. *Journal*, 4(2). Retrieved from <http://jcmc.indiana.edu/vol4/issue2/beller.html>
- Blignaut, S., & Trollip, S. R. (2003). Developing a taxonomy of faculty participation in asynchronous learning environments--an exploratory investigation. [doi: DOI: 10.1016/S0360-1315(03)00033-2]. *Computers & Education*, 41(2), 149-172.
- Blin, F., & Munro, M. (2008). Why hasn't technology disrupted academics' teaching practices understanding resistance to change through the lens of activity theory. [doi: DOI: 10.1016/j.compedu.2007.09.017]. *Computers & Education*, 50(2), 475-490.
- Butcher, N., & Wilson-Strydom, M. (2008). Technology and open learning: the potential of open education resources for K-12 education. In J. Voogt & G. Knezek (Eds.), *International Handbook of Information Technology in Primary and Secondary Education* (pp. 725-745). New York: Springer.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of two Theoretical Models. *Management Science*, 35, 982-1003.
- Davis, R., & Wong, D. (2007). Conceptualizing and measuring the optimal experience of the eLearning environment. *Decision Sciences Journal of Innovative Education*, 5(1), 97-126.
- Dutta, S., & MIA, I. (2011). *The Global Information Technology Report 2010–2011*. Geneva: World Economic Forum and INSEAD.
- Esterhuizen, H. D. (2011-2012). Journal of discussions with and observations of SCTE staff and students. North-West University.
- Esterhuizen, H. D., & Blignaut, A. S. (2011, 2-5 October). *A Localized Socially Transformative Learning Technology Integration Framework for ODL*. Paper presented at the 24th ICDE World Conference on Open & Distance Learning: Expanding Horizons - New approaches to Open and Distance learning (ODL), Nusa Dua, Bali.
- Esterhuizen, H. D., Blignaut, A. S., & Ellis, S. M. (2012). Looking out and looking in: Exploring a case of faculty perceptions during e-learning staff development.
- Esterhuizen, H. D., Blignaut, A. S., Ellis, S. M., & Els, C. J. (2012). ODL students' perceived computer literacy competencies, expectations of support, intention to use and perseverance. *Journal*, 14(3). Retrieved from http://tojde.anadolu.edu.tr/tojde49/articles/article_5.htm
- Esterhuizen, H. D., Blignaut, A. S., Els, C. J., & Ellis, S. M. (2012, 26-29 June). *Computer Literacy Learning Emotions of ODL Teacher-Students*. Paper presented at the Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2012, Denver, CO.
- Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention, and behavior: an introduction to theory and research, Available from <http://people.umass.edu/ajzen/f&a1975.html>
- Garrison, D. R. (2007). Online community of inquiry review: social, cognitive, and teaching presence issues. *Journal of Asynchronous Learning Networks*, 11(1), 61-72.
- Herrington, J., McKenney, S., Reeves, T., & Oliver, R. (2007). *Design-based research and doctoral students: Guidelines for preparing a dissertation proposal*. Paper presented at the World Conference on Educational Multimedia, Hypermedia and Telecommunications 2007
- Issroff, K., & Scanlon, E. (2002). Educational technology: the influence of theory. *Journal*, (6). Retrieved from <http://www-jime.open.ac.uk/2002/6>
- Jung, C. G. (1990). *The archetypes and the collective unconscious* (Vol. 10th, Part I, Bollingen Series XX). New York: Princeton University Press.
- Kort, B., Reilly, R., & Picard, R. (2001, 6-8 August). *Affective model of interplay between emotions and learning: reengineering educational pedagogy--building a Learning Companion*. Paper presented at the Advanced Learning Technologies, 2001, Madison, WI.
- Lin, K.-M. (2011). e-Learning continuance intention: moderating effects of user e-learning experience. *Computers & Education*, 56(2), 515-526.
- Longworth, N., & Davies, W. K. (1996). *Lifelong learning: new vision, new implications, new roles for people, organizations, nations and communities in the 21st century*. London: Kogan Page.
- MacKeogh, K., & Fox, S. (2008, 6 November). *Strategies for embedding e-learning in traditional universities: drivers and barriers*. Paper presented at the 7th European Conference on e-Learning, Reading.
- Maxcy, S. J. (2003). Pragmatic Threads in Mixed Methods Research in the Social Sciences: The Search for Multiple Modes of Inquiry and the End of the Philosophy of Formalism. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 51-90). Thousand Oaks: Sage Publications.
- Melrose Training. (2011, 30-31 March). *Proceedings at the Intel Education: ICT in the Classroom Conference*. Paper presented at the Africa Higher-Ed ICT Conference, Rosebank, South Africa.

- Moolman, H. B., & Blignaut, S. (2008). Get set! e-ready, ... e-learn! The e-readiness of warehouse workers. *Educational Technology & Society*, 11(1), 168-182.
- Müller, J. (2011). Gendering 'the Millennials'. Analysing staff responses to new student profiles in Spanish ICT higher education. *Journal*, 3(2). Retrieved from <http://genderandset.open.ac.uk/index.php/genderandset/article/view/170/342>
- Mutula, S. M. (2008). Digital divide and economic development: case study of sub-Saharan Africa. *The Electronic Library*, 26(4), 468-489.
- Norris, P. (2001). *Digital divide: Civic engagement, information poverty and the Internet world-wide*. Cambridge, MA: Cambridge Univ. Press.
- Oblinger, D. G., & Oblinger, J. L. (2005). Educating the Net Generation, Available from <http://www.educause.edu/educatingthenetgen>
- OECD. (2010). *Are the new millennium learners making the grade. Technology and educational performance in PISA*. Paris: OECD.
- Peirce, C. S. (1966). *Collected papers of Charles Sanders Peirce*. Cambridge, MA: Belknap Press of Harvard University Press.
- Pelgrum, W. J. (2008). School practices and conditions for pedagogy and ICT. In N. Law, W. J. Pelgrum & T. Plomp (Eds.), *Pedagogy and ICT use in schools around the world: Findings from the IEA SITES 2006 study* (pp. 67-121). Hong Kong: Springer and the Comparative Education Research Centre, The University of Hong Kong.
- Reeves, T. (2006). Design research from a technology perspective. In J. Van den Akker, K. Gravemeijer, S. McKenney & N. Nieveen (Eds.), *Educational Design Research* (pp. 86-109). London: Routledge.
- Sánchez, J., Salinas, A., Contreras, D., & Meyer, E. (2010). Does the new digital generation of learners exist? A qualitative study. *Journal*. Retrieved from <http://www3.interscience.wiley.com/cgi-bin/fulltext/123340848/PDFSTART>. doi:10.1111/j.1467-8535.2010.01069.x
- Scanlon, E. (2010). Technology enhanced learning in science: interactions, affordances and design based research. *Journal*, (8). Retrieved from <http://jime.open.ac.uk/2010/08>
- Schneckenberg, D., Ehlers, U., & Adelsberger, H. (2011). Web 2.0 and competence-oriented design of learning—potentials and implications for higher education. *British Journal of Educational Technology Vol 42 No 5 2011*, 42(5), 747-762.
- Schwier, R. A. (2010). Focusing Educational Technology Research on Informal Learning Environments. *Contemporary Educational Technology*, 1(1), 90-92.
- South Africa. Department of Education. (2004). *White paper on e-Education*. Retrieved 13 Mar. 2011. from <http://www.info.gov.za/view/DownloadFileAction?id=68767>.
- Tashakkori, A., & Teddlie, C. (Eds.). (1998). *Mixed Methodology: Combining Qualitative and Quantitative Approaches* (Vol. 46). Thousand Oaks: Sage Publications.
- Taylor, J. C. (2001). *Fifth generation distance education*. Paper presented at the ICDE 20th World Conference. Retrieved 23 July 2011, from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.113.3781&rep=rep1&type=pdf>
- UNESCO. (2002). *Information and communication technologies in teacher education: a planning guide* (No. ED/HED/TED/3): UNESCO.
- Van den Akker, J., Gravemeijer, K., McKenney, S., & Nieveen, N. (2006). Introduction to educational design research. In J. Van den Akker, K. Gravemeijer, S. McKenney & N. Nieveen (Eds.), *Educational design research* (pp. 1-8). London: Routledge.
- Wenger, E. (1998). Communities of practice: learning as a social system. *Systems Thinker*, 9(5).
- White, D. (2009). Digital literacy and ICT competence. Retrieved 25 August, 2010, from http://www.e-skills-ilb.org/docs/DW_on_e-skills_for_Baltic_ICT_forum_090329.pdf
- World Bank. (2012). *South Africa economic update: Focus on inequality of opportunity*. Washington, DC: The World Bank.

Student's Perception about Online Interaction, Access and Publishing Content for Academic Use

Carlos Arturo Torres-Gastelú

Veracruzana University, Faculty of Management, Veracruz 91780, Veracruz. Mexico
ctorres@uv.mx

Agustin Lagunes Dominguez

Veracruzana University, Faculty of Accounting and Management, Orizaba 94452, Veracruz. Mexico
aglagunes@uv.mx

Maria Alicia Flores García

Veracruzana University, Faculty of Accounting and Management, Orizaba 94452, Veracruz. Mexico
maflores@uv.mx

Gábor Kiss

*Óbuda University, Donát Bánki Faculty of Mechanical and Safety Engineering, Institute of Machine Design and Safety Engineering,
Budapest PO box H-1081, Hungary*
kiss.gabor@bgk.uni-obuda.hu

Angel Roberto Alejandro Espinoza

Veracruzana University, Faculty of Management, Veracruz 91780, Veracruz. Mexico
roberto-alejandro@hotmail.com

ABSTRACT

In this document we show preliminary results of the Students' perception about their level of ICT competencies in public secondary schools in Veracruz, Mexico. It was a quantitative study using a survey applied to 979 students from two schools. Survey was composed of 72 items. Preliminary results indicate a low level of ICT use in the students of secondary schools in the city of Veracruz related with online interactions, access and publishing content for academic use.

Keywords: ICT, secondary schools, teaching-learning, online interaction, ICT skills, digital divide, digital natives.

INTRODUCTION

In recent years, ICT has taken an important role in our society and are used in a multitude of activities. ICT are already part of most sectors: education, robotics, public administration, employment, business, health.

The use of Information Technology and Communication (ICT), leading to our current information society, represents one of the most refreshing proposals for current education systems, through which key project elements around the transformation of various processes in traditional formal education (Galindo, 2011).

The technological advance developed in the last two decades in terms of communication / information, makes clear that social life is changing significantly the degree of also get involved in educational institutions despite the strength of its integrated systems on them (Galindo, 2011).

In this article, we particularly deal with gaps in competencies or skills using ICT, analyzing the factors that explain the skills and characteristics that may determine different levels of ICT competencies.

Theoretical framework

ICT and secondary education.

The case of ICT also raises an issue of particular relevance: the so-called digital divide. This term is used when considering the differences between different groups of people, in their knowledge and mastery of new technologies. These differences may be influenced by socioeconomic factors (for example, there is strong contrast between the developed countries and third world), or other issues such as age and gender. Regarding the latter, it may be of interest exposed by Prensky 2001, who speak of the natives and digital immigrants. So, we can say that Information and Communications Technology (ICT) is an educational tool unprecedented (Pantoja, & Huertas, 2010).

Never before, the students had received such a volume of information. However, information is not equal to knowledge, so ICT only can help to improve education for students if teachers know how to take advantage. The problem is that ICT are an underutilized resource in teaching and their integration could open the door to a new era of education. ICT has only just come to the classroom, but it points the way to a profound transformation of the educational model that will involve both students and teachers (Pantoja, & Huertas, 2010).

Therefore, an increasing number of countries have accepted the need to introduce compulsory education in a formative dimension that provides young people with the necessary keys to understand the technology.

Factors explaining the gaps in ICT skills.

Digital Divide concept is not only related to ICT access, but also with the ability to use these technologies; ie, skills or abilities that the population need to acquire for the use of ICT and their effective use in different areas such as: entertainment, communication, education, etc. (Matamala, 2015).

The gap is not only limited to physical access, but also to how people use ICT. Such gaps, is what has been called gaps second order (Matamala, 2015), so this refers to the proper use of ICT in all areas.

Generational changes have shown that not all human beings are able to incorporate the order of the material discourse that build ICT: they are not just teachers, to name a collective considered central to our society who refuse to arrival at use and application of ICT in the classroom or your life. It has been already shown that generational changes do not always get along with technologies, especially if they affect significantly on the processes of socialization and training of human beings (León & Caudillo, 2014).

Today in Mexico, the digital divide is made up of about 70% of the total population with large asymmetries depending of ICT penetration in urban and rural areas; whereas in 630 major urban areas 30% of its population has Internet access in rural areas only 6% of its population (5.9 million households) have a computer and 3% are connected to Internet. According to the National Statistical Institute of Mexico (INEGI), these data are due primarily to the lack of financial resources (INEGI, 2013).

We can establish that there are gaps in ICT competencies of secondary school students as socioeconomic level, years of computer use, frequency of computer use and level of confidence in the use of computers, coinciding with the factors that have been identified in previous studies about gaps in the use of ICT (Matamala, 2015).

Some key elements to promote ICT competencies and also reduce Digital Divide could consider including computers in the early years of teaching and promote students' confidence in using computers (Matamala, 2015).

Digital natives.

The popular concept of "digital natives" came in 2001 when a new media analyst wrote an article titled "Digital Natives, Digital Immigrants". The purpose of this study was to analyze the changes among college students due to the influence of technology. Prensky, the author, proposed a distinction between citizens who were born after the digital revolution and those who had done before (Covi, 2010).

His proposal evolved and eventually led to the digital natives identify with those who were born and raised in times of internet (Covi, 2010).

The young generation has been born immersed in the development of new technologies, produced during the last decades of the twentieth century, is the generation of digital natives. Those people is clearly identified by the use of social networks, computer games, Internet, cell phone or instant messaging as an integral part of their lives (León & Caudillo, 2014).

In addition, the uses of ICT is altering people in many ways, the mindset of this generation has changed and is different from their elders. By contrast, people who are not born immersed in this environment of new technologies, but they are forced to use them, are called technological immigrants. This is a generation that, we could say they naturally not speak the language of the new technologies (León & Caudillo, 2014).

If for these technologies are digital native mother tongue, for the digital immigrant is a foreign language, and hence multiple times prove a certain accent. These differences between the native and digital immigrant pose a challenge from an educational point of view and protector, because often parents and teachers are overwhelmed by smaller in handling new media (Covi, 2010).

So, it means there are huge differences between the current generations, because the teachers who are teaching to the students do not born with these technologies. And the new generation of teachers should learn how to use ICT to teach. In this sense, also the digital native should learn how to study using this technology.

Therefore, it is very important to study the situation that we are experiencing in the schools about the process of incorporating ICT in the teaching-learning method. Also is relevant to take in consideration new studies dedicated to understanding the forms and processes to operate in environments characterized by teachers who were forced to adapt to the use of technology with students who were born with it.

In this sense, the analysis of ICT competencies in students and teachers was established as a mechanism to help understand and define strategies for improving the quality of education strategies and thereby reduce the digital divide.

METHODOLOGY

The origin of this report came from a research project between two Mexican universities: Technological Institute of Sonora (ITSON) and Veracruzana University (UV) in order to make comparative analysis between the perceptions of students at the secondary level. For this reason was considered secondary schools in Sonora and Veracruz. In Table 1 shows detail information about the sample of 979 students.

The quantitative instrument was composed by 178 items. However, in this document we will show the preliminary results of just 72 items of the secondary schools in Veracruz city. In this document we present the results of two dimensions: On line interaction and Access and Publication of Contents.

The results were obtained using the statistical program SPSS 21. The analytic strategy used was to show the descriptive statistics of the overall results with respect to the frequencies in selected dimensions.

Table 1. Statistic by gender

Name of institution	Gender		Total
	Male	Female	
Industrial Technical School # 1 (ITS #1)	264	323	587
Secondary General Miguel Alemán #5	188	204	392
Total	452	527	979

RESULTS

Online interaction

In Figure 1 and Table 2, we show the results about online interaction (OL) dimension. By type of activities used by students regarding the dimension of online interaction in the first item related to use of e-mail and virtual forum to exchange academic views with peers and teachers, the perception of the students about the competencies level, showed 43.1% consider themselves as no competent, meanwhile 56.9% of the students consider themselves as competent students.

Referring to the item of use social networks to exchange academic information considered 42.8% students consider themselves as no competent and 57.2% of students consider themselves as competent students.

The item using discussion forums to ask questions and research problems, was selected by 49.3% students consider themselves as no competent and 50.7% of students are auto considered as competent students.

On the other hand, operating working groups to develop research online, in terms of the range of percentages as in the previous case the results are very similar and that this time the results were more balanced, with 49.1% students consider themselves as no competent and 50.9% of students consider themselves as competent students. Referring to use software for sharing information on the network with peers and teachers, the result obtained was by 43.3% students consider themselves as no competent and 56.7% of students consider themselves as competent students.

Regarding using the Chat and online discussion forums to discuss academic papers, the results show 47.3% students consider themselves as no competent and 52.7% of students are auto considered as competent students.

In item, use telecommunications for interaction, publishing and collaborating with other students, an incidence of 46.3% students consider themselves as no competent and 53.7% of students consider themselves as competent students.

As to online Work collaboratively with other students, the frequency of percentages presents results of 46.6% students consider themselves as no competent and 53.4% of students consider themselves as competent students.

In the case of communicate information through digital media as Chat, online forums, among others, the range of percentages exhibits behavior of 40.2% students consider themselves as no competent and 59.8% of students consider themselves as competent students.

To connect with students from other parts of the country itself and other countries, showing a full turn to all results, with 64.7% students consider themselves as no competent and 35.3% of students consider themselves as competent students.

For the Item about manage platforms for interaction with peers and teachers, 62.2% students consider themselves as no competent and 37.8% of students consider themselves as competent students.

In the other hand, about the item using technology platforms where doubts with teachers and classmates are clarified, I got the same incidence of the above two cases showing some degree of non-competition this time represented with 61.5% students consider themselves as no competent and 38.5% of students consider themselves as competent students.

About the item of using digital formats to communicate information to various audiences, 56.1% students consider themselves as no competent and 43.9% of students consider themselves as competent students.

Use free software to work with teachers and students in learning, was selected by 54.2% students consider themselves as no competent and 45.8% of students consider themselves as competent students.

Finally, the item use using social networks to collaborate with students and teachers in sharing videos, comments, Chat, among others, returning results to the frequency on the above results favoring competition among students, with 42.3% students consider themselves as no competent and 57.7% of students consider themselves as competent students.

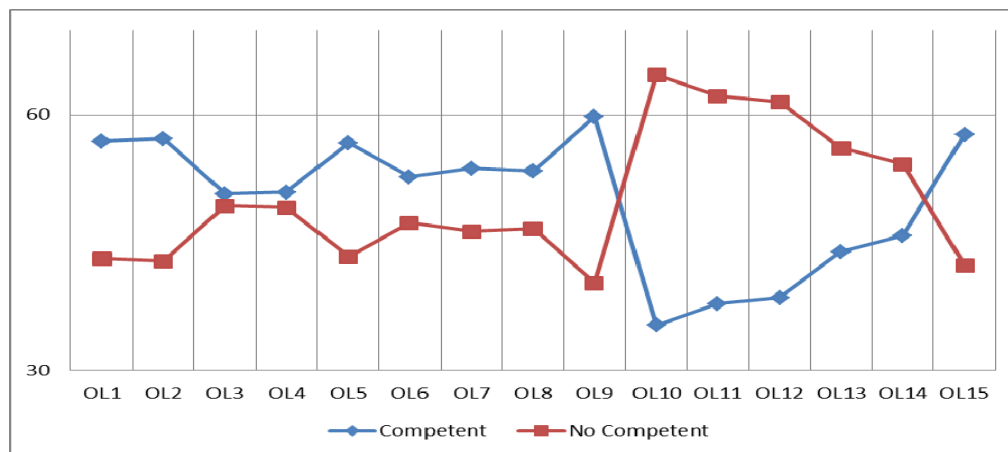


Figure 1. Competencies Online Interaction.

Table 2. Competencies On-Line Interaction.

	No Competent	Competent
OL1 Use of e-mail and virtual forum to exchange academic views with peers and teachers.	43.1%	56.9%
OL2 Use social networks to exchange academic information.	42.8%	57.2%
OL3 Using discussion forums to	49.35	50.7%

ask questions and research problems.		
OL4 Operating working groups to develop research online.	49.1%	50.9%
OL5 Use software for sharing information on the network with peers and teachers.	43.3%	56.7%
OL6 Using the Chat and online discussion forums to discuss academic papers.	47.3%	52.7%
OL7 Use telecommunications for interaction, publishing and collaborating with other students.	46.3%	53.7%
OL8 Online Work collaboratively with other students.	46.6%	53.4%
OL9 Communicate information through digital media as Chat, online forums, among others.	40.2%	59.8%
OL10 Connect with students from other parts of the country itself and other countries.	64.7%	35.3%
OL11 Manage platforms for interaction with peers and teachers.	62.2%	37.8%
OL12 Using technology platforms where doubts with teachers and classmates.	61.5%	38.5%
OL13 Using digital formats to communicate information to various audiences.	56.1%	43.9%
OL14 Use free software to work with teachers and students in learning.	54.2%	45.8%
OL15 Using social networks to collaborate with students and teachers in sharing videos, comments, Chat, among others.	42.3%	57.7%

Access and publishing content

In Figure 2 and Table 3, we show the results about access and publishing content (AP) dimension. For the dimension access and publishing content, in the item related to evaluate academic content and electronic bibliography from Internet in the distribution percentages detail the results with 48% students consider themselves as no competent and 52% of students consider themselves as competent students.

While using technology platforms for accessing content, presents a similar balance with 47.6% students consider themselves as no competent and 52.4% of students consider themselves as competent students.

Continuing with the analysis of results in the item of publish academic content in educational blogs, is represented by a corresponding result to 57.5% students consider themselves as no competent and 42.5% of students consider themselves as competent students.

Referring to organize, process and discriminate the information gathered from the Internet to communicate results indicates that there are similarities with respect to the degree of competitiveness and incompetence with only 49.8% students consider themselves as no competent and 50.2% of students consider themselves as competent students.

On the other hand the same way as above in item publish academic work through some means: website, slideshare, etc. showing slight similarity 49% students consider themselves as no competent and 51% of students consider themselves as competent students.

Use educational platforms to send jobs mark the same features as the previous results only marking contrary no difference favoring competition, shows a result of 50.6% students consider themselves as no competent and 49.4% of students consider themselves as competent students.

As for handle virtual communication channels (messaging, forums, Weblogs, Wikis, etc.) to share content denotes a different distribution of results obtained with 45.9% students consider themselves as no competent and 54.1% of students consider themselves as competent students.

Finally the next representative for the item web pages operated to upload academic papers value was different from the previous case due to the difference that most percentage was not competent for the option with 53.2% students consider themselves as no competent and 46.8% of students consider themselves as competent students.

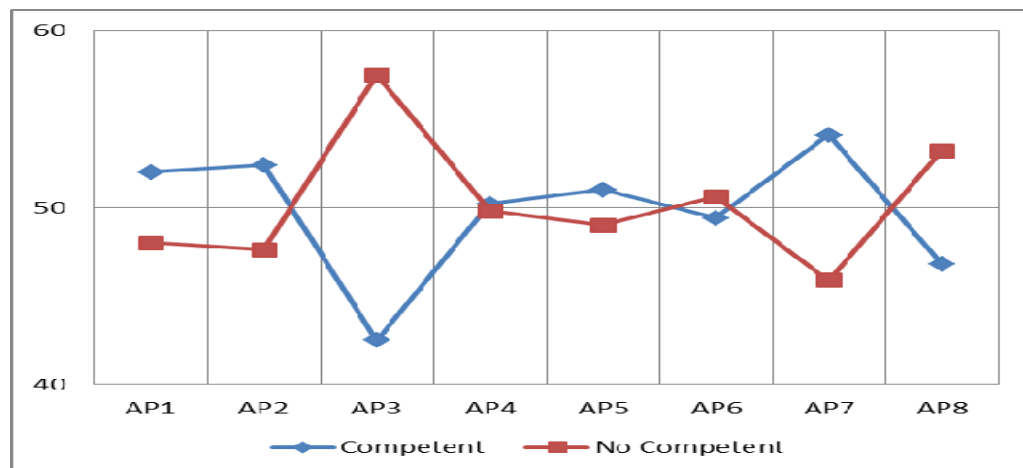


Figure 2. Competencies Access and Publishing Content

Table 3. Competencies Access and Publishing Content

	No Competent	Competent
AP1 Evaluate academic content and electronic bibliography from Internet.	48	52
AP2 Using technology platforms for accessing content.	47.6	52.4
AP3 Publish academic content in educational blogs.	57.5	42.5
AP4 Organize, process and discriminate the information gathered from the Internet to communicate.	49.8	50.2
AP5 Publish academic work through some means: website, slideshare, etc.	49	51
AP6 Use educational platforms to send jobs.	50.6	49.4
AP7 Handle virtual communication channels (messaging, forums, Weblogs, Wikis, etc.) to share content.	45.9	54.1
AP8 Web pages operated to upload academic papers value.	53.2	46.8

CONCLUSIONS

Today ICT is fundamental to improving the quality of teaching tools, but only if students know how to take advantage, have the proper training and have the necessary resources.

Children and adolescents who currently entering educational institutions were born in the digital age; in it the development of ICT has led to the emergence of novel communication styles and cognitive skills, facilitating the creation of new dimensions in the categories of author and reader that have enabled the construction of a new subject of knowledge (Navés, 2015).

There is a low level of ICT competencies in the students of secondary schools in the city of Veracruz. Apparently the students are in the process of developing of these skills. However, they require increase the frequency and forms of ICT use for academic purposes, greater interaction between peers and teachers in the exchange of views and dissolving of doubts, as well as increasing the use of educational platforms, blogs, web pages, etc., for the publication and exchange of educational content.

In this sense, we find that, students still do not have a high level in the use of ICT for education purposes, which implies a deficiency in the cost-benefit ratio for society. Technological change globally has become a paradigm that appears to regulate the growth of countries; the level of ICT use in education represents a great opportunity for individuals to the path of knowledge and its inclusion in the Current society characterized by a self-learning management supported by the application of digital skills.

REFERENCES

- Galindo, A. C. (2011). Representaciones sociales de las prácticas tecno-educativas en profesores de nivel básico (secundaria) en distintos contextos educativos en Colima. *Congreso Internacional Educación Mediática y Competencia Digital 2011*. Recovered from: <http://www.educacionmediatica.es/comunicaciones/Eje%201/Alma%20Celia%20Galindo.pdf>
- Prensky, M. (2001). Digital natives, digital immigrants. *On the horizon*, 9 (5), 1-6. Recovered from: <http://www.marcprensky.com/writing/Prensky%20-%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf>
- Pantoja, A. & Huertas, A. (2010). Integración de las TIC en la asignatura de tecnología de educación secundaria. *Pixel-Bit Revista de Medios y Educación*, 37, 225-337. Recovered from: <http://www.sav.us.es/pixelbit/pixelbit/articulos/n37/18.pdf>
- Matamala, C. (2015). Factores predictivos de las competencias TIC en alumnos chilenos de secundaria. *Revista Iberoamericana de Educación*, 67 (1), 121-136. Recovered from: <http://www.rieoei.org/deloslectores/6701Matamala.pdf>
- León, G. A. & Caudillo, D. (2014). Relaciones interactivas, internet y jóvenes de secundaria en México: primera oleada sobre usos, consumos, competencias y navegación segura en internet en Sonora(2013). *Revista internacional de tecnologías en la educación*, 1 (2), 41-50. Recovered from: http://sobrelaeducacion.com/_uploads/Rev_Int_de_Tecnologias_en_la_Educacion_1%282%29,_2014.pdf
- INEGI Instituto nacional de estadística y geografía. (2013). Boletín de prensa número 270/12, pp: 1/7. México. Disponible en: www.inegi.org.mx
- Crovi, D. M. (2010). Jóvenes, migraciones digitales y brecha tecnológica. *Revista mexicana de ciencias políticas y sociales*, 52 (209), 119-133. Recovered from: <http://www.revistas.unam.mx/index.php/rmsps/article/view/25967>
- Navés, F. A. (Enero-Junio 2015). Las TIC como recurso didáctico: ¿Competencias o posición subjetiva? *Revista de Investigación Educativa*, 20, 238-248. Recovered from: <http://revistas.uv.mx/index.php/cpue/article/view/1308/2399>

The Effect of Emotional Labor on Job Involvement in Preschool Teachers: Verifying the Mediating Effect of Psychological Capital

Ching-Sheue FU

Department of Early Childhood Caring and Education, Chung Hwa University of Medical Technology
misssallyfu@gmail.com

ABSTRACT

In this study, the participants comprised 385 preschool teachers. The relationship among their emotional labor, Job Involvement, and psychological capital were examined using hierarchical regression analysis. In addition, whether psychological capital exerted a mediating effect on Job Involvement was investigated. The results show that “deep acting exerted” the strongest influence on Job Involvement in preschool teachers and that high psychological capital alleviated their emotional burden. Moreover, “self-efficacy” and “optimism” mitigated the need for psychological satisfaction of work in preschool teachers. In addition, “optimism” exerted a mediating effect on the relationship between emotional labor and Job Involvement in preschool teachers.

Key words: Emotional Labor, Job Involvement, Psychological Capital, Preschool Teachers

INTRODUCTION

In modern society, many preschool children must be accompanied by a preschool teacher throughout this critical period of their lives. In recent years, first-line professionals providing preschool services have encountered an increasing number of difficulties when sustainably running their preschool businesses because of a declining birth rate and unclear childcare policies (Lee & Chen, 2006). These preschool teachers, who must interact with children and adults every day, must continually control their emotions to complete their jobs. When students perform favorably at school, their preschool teachers must actively praise and encourage them, and when the students’ performance is poor, the preschool teachers must manage the students’ deviant behaviors calmly and with confidence. To achieve these professional goals, preschool teachers are sometimes required to show or exaggerate certain emotions or to reduce or suppress certain emotions. In fact, teaching requires emotional engagement as well as technical and cognitive engagement. In addition to managing students, preschool teachers must manage requirements from parents and various administrative bodies. Thus, the role which preschool teachers play is that of an emotional laborer (Brouwers & Tomic, 2000; Brotheridge & Grandey, 2002; Johnson et al., 2005; Kamerman, 2000; Näring, Briet & Brouwers, 2006).

According to the definition of emotional labor (EL) in the context of education proposed by Hochschild (1983), students are similar to customers, and operating a school is similar to managing a company that must sell products and service customers. Teachers commonly interact with people and may address various emotional problems at work. Many studies have suggested that, because of external pressures, teachers who cannot address their emotions promptly experience work stress. After prolonged stress, teachers may become exhausted and tire of their jobs. This fatigue can exert an extremely negative influence on teachers’ physical and psychological health and on the quality of their teaching (Mark & Anderson, 1987; Pakarinen et al., 2010).

Society holds idealized images of teachers, but these images do not deprive them of personal agency in the classroom (Oplatka, 2007). Teachers voluntarily engage in emotional teaching practices on the basis of their assessment of student responses. Researchers have used “emotional work” to describe the choices teachers make when implementing emotions in the classroom (Caires & Almeida, 2007; Fu, 2011; Isenbarger & Zembylas, 2006; Op’t Eynde & Turner, 2006). The emotions that preschool teachers must address at work concern more than labor. Teachers enter a working environment where they experience children’s sweetness and innocence and can perform their job with a positive attitude (Fu, 2011). This positive attitude is their psychological capital (PsyCap), which can influence their individual growth and development and improve their performance (Luthans, Avey, Avolio & Norman, 2007). Teaching is an emotionally draining profession. Teachers continually devote themselves to their profession both emotionally and intellectually. Teaching is labor requiring a considerable depletion of emotions (Hargreaves, 1998; Heck & Williams, 1984).

Pugh (2001) noted that many studies of EL have focused on job requirements, ignoring the roles of environmental factors and individual conditions; in other words, teachers’ psychological conditions and identification with their job should be considered in the study of preschool teachers’ EL. Emotional labor may lead to emotional exhaustion and burnout, while influences of some psychological capital are also involved (Jensen & Luthans, 2006; Wu, 2010). The findings obtained by exploring the relationships amongst EL, job

involvement (Job-in), and PsyCap as well as the intermediating effects of the PsyCap of preschool teachers can serve as references for preschools, preschool teachers, and institutions of preschool-teacher education and enable preschool teachers to understand their emotional states and increase their Job-in through improved PsyCap, thereby facilitating children's learning and development.

The purposes of this study are the following:

- (a) To explore the relationships amongst preschool teachers' EL, Job-in, and PsyCap
- (b) To explore whether the intermediating effect of PsyCap on the relationship between preschool teachers' EL on their Job-in is significant.

LITERATURE REVIEW

Definition of Emotional Labour and Related Studies

The concept of EL was first proposed by Hochschild (1983), he believed that the cabin crew's emotional expressions followed rules that were mandated by their employer and required them to fake their emotions to please their customers. EL has gradually become a concern and has been broadly discussed in education and other disciplines (Roulston, 2004). At work, emotional laborers may express positive and happy emotions to create a joyful working atmosphere, negative and somber emotions to create an atmosphere that establishes a psychological distance between them and customers, or neutral and impartial emotions to project a professional image (Hochschild, 1983; Wharton, 1993; Morris & Feldman, 1996). In other words, EL is the manner in which employees control their personal emotions at work to meet the expectations of their employer and use their words and body language to make customers feel cared for, safe and happy during interactions (Hochschild, 1983). Studies using teachers as research subjects have suggested that teachers are emotional laborers (Brotheridge & Grandey, 2002; Roulston, 2004). Teachers in preschools are first-line professionals tasked with interacting with students and parents. These professionals are both technical and childcare personnel. According to the categorization by Hochschild (1983), they are laborers bearing a high emotional load.

The meaning of EL can be analyzed from two aspects: the suppression and expression of emotions in job-focused EL and deep-level and surface strategies of emotional actions in job-focused EL (Brotheridge & Grandey, 2002). Job-focused EL is the emotional regulation required for a job. Service-sector jobs that require employees to control their emotions whilst serving customers and to harness emotions to portray a certain work-role expectation involve job-focused EL (Brotheridge & Grandey, 2002). In this context, the "variety of emotions" (VE) refers to the spectrum of emotional responses expected of employees when interacting with people of different backgrounds, on different occasions, and in different places (Wharton, 1993). When a job requires more frequent and complex changes in emotional states from employees at work, and employees must expend additional effort to anticipate all possible situations and plan for appropriate responses, the employees are considered to engage in a high level of EL (Morris & Feldman, 1996). In contexts demanding a high level of EL, employees show positive emotions and hide negative emotions at work because of emotion-related regulations established by the company or organization for which they work (Wharton & Erickson, 1995). The positive or negative expression of emotions is regulated to a certain degree. The emotional performance of employees must meet the expected standards of their roles.

Employee-focused EL entails individualized and active management of work emotions and covers all active efforts to adjust those emotions (Brotheridge & Grandey, 2002). Employee-focused EL involves two types of active efforts for self-adjustment and regulation: surface emotional actions (SEAs) and deep-level emotional actions (DEAs). An SEA is the outward appearance that employees use to disguise or control the expression of their emotions whilst their true, inside feelings remain the same, satisfying the needs of their work life (Grandey, 2000). A DEA is an internalization process for emotional management used to accept the social standards of an organization and begins with adjusting the internal thinking and feeling systems of emotion control (Hochschild, 1983).

EL can be classified into job-focused EL, such as the regulation of emotional expressions by organizations to control public perceptions and the emotional complexity of emotions to be shown by employees in public places, and employee-focused EL, such as the surface emotional disguises worn by employees to adapt to their job requirements and the internalization of deep emotional needs. Job-focused EL stresses employees' psychological feelings regarding emotional demands at work, whereas employee-focused EL stresses employees' efforts in emotional adjustment.

On the basis of the argument by Hochschild (1983) and the EL loading scale developed by Lin (2000), Lee and Chen (2006) developed an EL scale for preschool teachers that incorporated the opinions and suggested modifications of domain experts regarding the EL of preschool teachers in the job field and divided EL into four

constructs: VE, requirements for emotional expression (REE) in job-focused EL, and SEA and DEA in employee-focused EL. The scale was used as the measurement tool in this study because its formation and development aligned with the study's purpose.

Definition of Job Involvement and Related Studies

Job-in was first proposed by Lodahl and Kejner (1965). They defined it as the degree to which employees identify with their jobs or the degree of importance that employees' jobs have to employees' self-worth. Soon after Lodahl and Kejner proposed the concept of Job-in, researchers began to pay close attention to Job-in (Robinowitz & Hall, 1977). Maslach, Schaufeli, and Leiter (2001) adopted an idea opposite to that of job burnout, suggesting that when employees dedicate considerable energy to a job, they can enter an efficient working state in which they relate well with others although being tired of working. The three features of Job-in are involvement, efficacy, and energy. When these features are transformed in reverse, or when an employee changes from being energetic to exhausted, from being involved to distant, and from being efficient to inefficient, burnout occurs. Schaufeli, Salanova, González-Romá and Bakker (2002) followed this thinking model, suggesting that high positive power enables resisting job burnout. They proposed that Job-in is based on pleasure and the activation of well-being. They defined Job-in as an active and satisfactory emotional and cognitive state associated with a job. The characteristics of this state include constancy and diffusivity. The state is not in connection with a certain goal, event, or situation but involves a positive experience of high energy and concentration whilst identifying strongly with work. Job-in is employees' cognition of the value of their work.

Hackman and Lawer (1971) believed that the degree of Job-in experienced by employees can be influenced by their self-respect and performance. In other words, when employees perceive that their job performance can facilitate satisfying their need for self-respect and can be improved through their efforts, they expend more energy at work. Therefore, Job-in is the main factor contributing to self-growth and satisfaction and a crucial factor for self-encouragement and goal orientation. The degree of employees' Job-in is related not only to their psychology and behavior but also to their performance at work (Kanungo, 1982). Kanungo (1982) suggested that past definitions of Job-in were too broad, resulting in low-precision measurement tools; therefore, he categorized Job-in into job involvement (JI) and work involvement (WI). JI refers to employees' faith in their current jobs and the degree to which those jobs can satisfy their personal needs, and WI refers to the value of work and its importance in the employees' lives. Therefore, Kanungo (1982) believed that two main factors influence Job-in and indicate employees' current internal and external needs and the possibility that the employees perceive that their jobs meet those needs. This study defined JI as employees' degree of identification with work, their jobs, and their external behaviors and attitudes and their degree of identification with the crucial influence of their job performance on their self-worth. This study adopted Kanungo's viewpoint regarding the constructs which comprise the JI scale.

Definition of Psychological Capital and Related Studies

Discussion of the origin of PsyCap should begin by considering positive psychology, which focuses on people's positive capabilities instead of on their previous negative experiences (Ryan & Deci, 2001; Seligman, 2012). Positive psychology is the science of subjective experiences, positive personal traits, and positive organization with the purpose of improving quality of life and preventing morbid states (Ryan & Deci, 2001). Positive psychology aims to study how the quality of human life can be improved. The core concept of PsyCap centers on ameliorating human lives (Luthans, Youssef & Avolio, 2007).

According to economics, capital is a valuable asset by which individuals and organizations create wealth. Luthans et al. (2004) suggested that, in the twenty-first century, a hypercompetitive environment, the competitive advantages of previous economic capital, human capital, and social capital cannot endure for long. PsyCap focuses on personal psychological qualities, such as "who you are" and "what you can become," according to a development-oriented viewpoint (Luthans, Youssef & Avolio, 2007). PsyCap cannot be obtained from the outside. It is different from human capital and social capital, which are influenced by high purchase costs and labor migration (Lee, 2009). PsyCap can help enterprises gain a greater competitive advantage in the marketplace. For individuals, PsyCap is an essential factor that facilitates personal growth and development and improves performance (Luthans, Avey, Avolio & Norman, 2007).

PsyCap is a combination of the concepts of positive psychology and capital; it consists of four constructs: self-efficacy (Self), optimism (Opt), hope (Hope), and resilience (Res) (Luthans et al., 2004; Luthans, Youssef & Avolio, 2007). PsyCap can be defined as having confidence, or Self, to take on and put in the effort necessary to succeed at challenging tasks; persevering toward goals and, when necessary, redirecting paths to goals (Hope); constructing a positive attribution (Opt) to succeed now and in the future; and enduring or recovering from problems and adversity to succeed (Res) (Luthans et al., 2004; Luthans, Youssef & Avolio, 2007). People rich in

PsyCap have confidence in themselves, are hopeful and resilient, and extend themselves with positive, active attitudes (Avey, Wernsing & Luthans, 2008; Luthans & Youssef, 2007). On the basis of the core concept of PsyCap proposed by Luthans et al. (2007), this study aimed to explore the PsyCap of preschool teachers from four aspects: Self, Opt, Hope, and Res.

Relationships amongst Emotional Labor, Job Involvement, and Psychological Capital

Teaching is tiring in an invisible way (Chiang 2002). Lord and Harvey (2002) suggested that when employees' JI is high, they may reappraise or redefine their work. The emotional loads that teachers bear may change according their personal adjustments. This change can, in turn, influence their JI (Lee & Ashforth, 1996). EL can lead to emotional exhaustion, followed by job burnout and low JI (Wu & Cheng, 2006; Grandey, 2000). Thus, this study proposed hypothesis [H1]:

[H1] Preschool teachers' EL influences their JI.

According to the argument of Hochschild (1983), preschool teachers who interact with parents and children everyday must continually control their emotions to achieve their professional goals. Preschool teachers engage in a high level of EL (Brotheridge & Grandey, 2002; Kamerman, 2000). Preschool teachers pay a high emotional price when teaching children and interacting with parents. At times, they must use positive energy from their personal traits to encourage themselves and remain dedicated to their work. This PsyCap, including positive energy, positive thinking related to goal achievement, optimistic self-motivation, and the capability to make adjustments after frustration, can significantly and positively influence a person's JI (May, Gilson, and Harter 2004). Thus, this study proposed hypothesis [H2]:

[H2] Preschool teachers' EL influences their PsyCap.

PsyCap is the positive energy in a preschool teacher's personal traits. Kahn (1990) believed that JI is mainly influenced by psychological conditions such as psychological meaningfulness, safety, and availability. Psychological meaningfulness is the value gained from a work goal or purpose and is judged in relation to a person's ideals or standards. Psychological safety is the experience of being able to act in a manner that is natural to that person and being able to use and employ all skills and knowledge in a role without fear of being ridiculed or of experiencing negative consequences. Psychological availability is the capability to engage as a result of having cognitive, emotional and physical resources. Previous studies on PsyCap have emphasized that its individual elements can facilitate an employee's job satisfaction, organizational commitment, sales performance, leadership effectiveness, and work effectiveness whilst reducing personal work pressure and demission rates and increasing organizational drive, transformation, and productivity (Avey, Patera & West, 2006; Peterson, Luthans, Avolio, Walumbwa, Zhang, 2011). Thus, this study proposed hypothesis [H3]:

[H3] Preschool teachers' PsyCap influences their JI.

This study integrated hypotheses [H1], [H2], and [H3] and verified that the EL and PsyCap of preschool teachers are related to their JI. Many studies have used PsyCap as a mediating variable and found the mediating effect of PsyCap to be statistically significant. The greater the mediating effect is, the more favorable a person's subjective perception and the higher an employee's job satisfaction are (Chung, 2009; Huang, 2009; Jensen & Luthans, 2006; Wu, 2010). Thus, this study proposed hypothesis [H4]:

[H4] Preschool teachers' EL influences their JI through the mediating effect of their PsyCap.

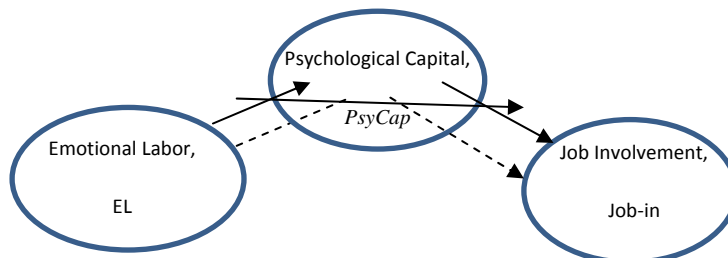


Figure 1 Structural model for hypotheses

METHODS

Participants

The population sampled in this study comprised all 450,004 preschool teachers in Taiwan (Department of Statistics, Ministry of Education, 2014). The required sample size, a given percentage of the population, was calculated. The conditions $n = Z^2 * p(1 - p)/\varepsilon^2$, $\alpha = 0.05$, $p = .50$, and $\varepsilon = 0.05$ were used to determine that the minimal required sample size was 384.16. Through numerical analysis, Krejcie and Morgan (1970) determined that the sample size should be 384. In consideration of the aforementioned conclusions, specifically, the sample size needed to be at least 5% of the population size and the estimated error needed to be within $\pm 0.50\%$ (confidence level: 95%) according to population size, 500 preschool teachers were selected for the survey. After invalid questionnaires were excluded, the valid sample size was 390, representing a response rate of 78%.

Research Tools

The research tools used in this study were an EL scale for preschool teachers, a PsyCap scale for preschool teachers, and a JI scale for preschool teachers. These scales were administered to the sampled research participants. Lee and Chen (2006) developed an EL scale for preschool teachers on the basis of the argument by Hochschild (1983) and the EL loading scale developed by Lin (2000). The EL scale was further modified after subject-matter experts provided opinions and suggestions regarding the preschool teachers' EL in the job field. This scale divides EL into four constructs, VE ($\alpha = .896$), REE ($\alpha = .836$), SEA ($\alpha = .797$), and DEA ($\alpha = .882$), and comprises 20 items.

The PsyCap scale for preschool teachers was created by Lee (2009), who referred to the PsyCap questionnaire developed by Luthans et al. (2007), the hope scale developed by Snyder et al. (2003), the life orientation test developed by Scheier and Carver (1985), and the resiliency scale developed by Baron and Kenny (1986), and contains 20 items and 4 factors, Self ($\alpha = .886$), Hope ($\alpha = .971$), Opt ($\alpha = .954$), and Res ($\alpha = .967$), in total.

The JI scale for preschool teachers was a revision of the JI scale developed by Kanungo (1982) with the terminology of the items being modified by a group of experts so that the items more closely resembled the characteristics of a preschool teacher's job. This scale contains 10 items and 2 factors, JI ($\alpha = .773$) and WI ($\alpha = .605$).

The items in the questionnaire used in this study were ranked on a Likert 6-point scale, which was employed to ensure that the participants could not provide a neutral answer (no opinion). The choices were agree strongly (6), agree (5), "agree slightly" (4), "disagree slightly" (3), "disagree" (2), and "disagree strongly" (1).

RESULTS AND DISCUSSION

Current Status of Preschool Teachers' Emotional Labor, Psychological Capital, and Job Involvement

The empirical data from 385 preschool teachers were collected, descriptive statistics were calculated, and relationships amongst the constructs were analyzed. Table 1 summarizes the descriptive statistics of the four factors of the preschool teachers' EL: VE, REE, SEA, and DEA. The participants' REE scores were the highest ($M = 5.20$; $SD = .67$), followed by their VE scores ($M = 4.99$; $SD = .74$), DEA scores ($M = 4.88$; $SD = .71$), and SEA scores ($M = 4.42$; $SD = .78$). All of the preschool teachers' scores for the four factors of EL were high; in other words, their EL scores were high. In particular, the scores indicated that REE was the highest emotional load that they perceived.

According to the descriptive statistics on the participants' scores for the four factors of PsyCap, the scores for Hope were the highest ($M = 4.84$; $SD = .66$), followed those for Self ($M = 4.83$; $SD = .69$), Opt ($M = 4.76$; $SD = .76$), and Res ($M = 4.61$; $SD = .79$). All of the preschool teachers' average scores for the four factors of PsyCap were close to 5 and to each other. These findings indicate that the teachers had substantial PsyCap.

According to the descriptive statistics on the participants' scores for the two factors of Job-in: JI and WI, the participants' JI scores were high ($M = 4.38$; $SD = .88$). The average WI was 2.74, which is lower than the median, 3, and the standard error was 1.14. The results showed that the preschool teachers' faith in their job was rather high and indicated that their job satisfied their personal needs to a high degree. By contrast, the value they obtained from their job and their perceived importance of their job in life were rather low, with high individual differences.

Relationships amongst Preschool Teachers' Emotional Labor, Psychological Capital, and Job Involvement

All relationships amongst the three constructs of EL, PsyCap, and JI (Table 1) as well as the relationships of WI with Hope, Opt, Res, and DEA (which were not significant) exhibited between-variable correlations between .083 and .334. These results indicated that the value preschool teachers obtained from their jobs and the

importance they perceived their jobs to have in their lives did not change because of their individual Hope, Opt, or Res scores. Although the preschool teachers may have had superior strategies for adjusting their emotions, the resulting scores were not related to the value obtained from their jobs. Furthermore, the correlations of JI with VE, REE, and Self were negative. Both VE and REE was job-focused EL; in other words, they entail expressing emotions in response to different work situations and to meet expectations for their role at work. Therefore, when expectations of the preschool teachers' emotions were high, their perceived value at work was low. In other words, the more preschool teachers had to change their emotional expression according to the needs of situations at work, the less they could devote themselves to the actual work of preschool teaching. The correlation between WI and Self was negative. Lawler and Hall (1970) suggested that people's JI is the importance of work in their lives. People with high JI can be influenced because they perceive their jobs to be a crucial part of their self-worth. The results of this study show that the higher the preschool teachers' perceived value of their job and their perceived importance of the job in their lives were, the lower their perceived Self was. The preschool teachers' perceived value at work and their Self were not consistent; therefore, the correlation was negative.

All correlations of JI with the four variables of PsyCap were positive. The higher the preschool teachers' faith in their job was, the higher their PsyCap was, and vice versa. Furthermore, although the correlation between JI and WI was significant, the correlation coefficient was rather low (.127). The research results showed that preschool teachers thought that their job could satisfy their needs, yet they also thought that the job was not vital to their personal lives. Kanungo (1982) suggested that JI may change. People's JI may change when their perception of the degree to which their needs are being met changes. Therefore, although the preschool teachers had high personal faith regarding their JI, the value they obtained at work and the importance of their job in their lives did not increase accordingly.

Table 1 The relationships among preschool teachers' emotional labor construct, psychological capital construct, and job involvement construct N=385

				Correlations									
Construct	Variable	Mean	SD	VE	REE	SEA	DEA	Self	Hope	Opt	Res	JI	WI
EL	VE	4.99	.74	1									
	REE	5.20	.67	.752*	1								
	SEA	4.42	.78	.450*	.412*	1							
	DEA	4.88	.71	.637*	.712*	.504*	1						
PsyCap	Self	4.83	.69	.571*	.530*	.334*	.560*	1					
	Hope	4.84	.66	.653*	.618*	.365*	.651*	.803*	1				
	Opt	4.76	.76	.660*	.645*	.357*	.622*	.658*	.715*	1			
	Res	4.61	.79	.661*	.627*	.358*	.654*	.657*	.710*	.801*	1		
Job-in	JI	4.38	.88	.441*	.480*	.367*	.613*	.523*	.527*	.614*	.566*	1	
	WI	2.75	1.14	-.108*	-.134*	.320*	.049	-.109*	-.067	-.056	-.044	.127*	1

* p < .05

Both the preschool teachers' EL and PsyCap were high, verifying the argument that preschool teachers engage in a high level of EL (Brouwers & Tomic, 2000; Brotheridge & Grandey, 2002; Johnson et al., 2005; Kamerman, 2000; Näring, Briet & Brouwers, 2006). PsyCap is a crucial psychological factor that supports preschool teachers (Pugh, 2001). Working in an environment with a high level of EL, preschool teachers require excellent psychological condition to expend the emotions and release the stress experienced in their jobs. In response to the trend of decreasing birth rates in Taiwan, preschools extend their childcare hours, and teachers must engage in services such as daytime transport and recruitment. All of these tasks at work have exerted great pressure on preschool teachers (Lin & Tsai, 2002; Chang & Hung, 2008). However, preschool teachers' self-cognition remains high, assisting them in slightly reducing their emotional loads. In the JI construct, according to the preschool teachers' self-reported information, their performance in JI was rather high. Their faith in their job was high and their personal needs were met to a certain degree. However, the average WI score in the 6-point scale was only 2.75 points, meaning that the value and importance of the job were not sufficient to make the preschool teachers willing to become more devoted to their work.

Influences of the Constructs

1. Regression Analysis of the Effect of Preschool Teachers' Emotional Labor on Their Job Involvement

This study applied the hierarchical regression method with EL as the independent variable to explore the

influence of EL on JI. As shown in Table 2, the VE construct of EL significantly and negatively influenced WI ($\beta = -.196$, $p < .05$), but did not significantly influence JI. These results indicated that the more preschool teachers expressed emotions required by their work setting for the overall benefit of their preschool, the less important they believed their job to be in their lives and the lower their sense of value was; conversely, the faith they held in their jobs was not influenced.

REE significantly and negatively influenced WI ($\beta = -.272$, $p < .05$), but had no significant influence on JI. The results showed that the more the preschool teachers exhibited positive emotions and hid negative emotions for the organizational benefits of the preschool for which they worked, the less they identified with the value of their job; however, their faith in their work was not influenced.

SEA significantly influenced WI ($\beta = .449$, $p < .05$), but had no significant influence on JI. The results indicated that the preschool teachers' personal emotional disguises facilitated increasing their perceived importance of their job in life; however, their perceived satisfaction of their psychological needs was not influenced. The influences of the DEA on both WI ($\beta = .141$, $p < .05$) and JI ($\beta = .076$, $p < .05$) were significant. The results showed that the preschool teachers' methods for adjusting their emotions increased the satisfaction of their psychological needs and their perceived importance of their jobs in life. Thus, the hypothesis stating that preschool teachers' EL influences their JI, [H1], was supported.

Table 2 The regression analysis of preschool teachers' emotional labor on their job involvement N=385

Independent Variable		Dependent Variable	
		JI	WI
Emotional Labor, EL			
	VE	.043	-.196*
	REE	.056	-.272*
	SEA	.054	.449*
	DEA	.076*	.141*
F		58.245*	24.559*
P		.000	.000
Adj R ²		.377	.200

Note: The regression coefficients shown in the table are standardized β coefficients

* $p < .05$

2. Regression Analysis of the Effect of Preschool Teachers' Emotional Labor on Their Psychological Capital

This study applied the hierarchical-regression method with EL as the independent variable to explore the influence of EL on PsyCap. As shown in Table 3, the influences of the VE on Self ($\beta = .325$, $p < .05$), Opt ($\beta = .347$, $p < .05$), and Res ($\beta = .362$, $p < .05$) were significant; the influences of REE on Hope ($\beta = .060$, $p < .05$) and Opt ($\beta = .201$, $p < .05$) were significant; and the influences of DEA on Self ($\beta = .300$, $p < .05$), Hope ($\beta = .363$, $p < .05$), Opt ($\beta = .265$, $p < .05$), and Res ($\beta = .360$, $p < .05$) were significant. The influences of SEA on all four aspects of PsyCap were not significant. The results indicated that, when the preschool teachers were willing to change their emotion adjustment strategies, their PsyCap increased. However, when they merely disguised or faked their emotions, their PsyCap was not influenced. Overall, the hypothesis stating that preschool teachers' EL influences their PsyCap, [H2], was supported.

Table 3 The regression analysis of preschool teachers' emotional labor on their psychological capital N=385

Independent Variable		Dependent Variable			
		Self	Hope	Opt	Res
Emotional Labor, EL					
	VE	.325*	.051	.347*	.362*
	REE	.068	.060*	.201*	.111
	SEA	.009	-.019	-.016	-.032
	DEA	.300*	.363*	.265*	.360*
F		60.402*	102.551*	100.544*	106.771*
P		.000	.000	.000	.000
Adj R ²		.386	.518	.513	.528

Note: The regression coefficients shown in the table are standardized β coefficients

* $p < .05$

3. Regression Analysis of the Effect of Preschool Teachers' Psychological Capital on Their Job Involvement

This study applied the hierarchical regression method with PsyCap as the independent variable to explore the influence of PsyCap on JI. As shown in Table 4, the influence of the Self aspect of PsyCap on JI ($\beta = .158$, $p < .05$) was significant, as was the influence of Opt on JI ($\beta = .377$, $p < .05$). Therefore, the hypothesis stating that preschool teachers' PsyCap influences their JI, [H3], was supported. Yet, this analysis yielded unexpected results; the influences of all four aspects of PsyCap on WI were not significant. The results showed that, regardless of how high the preschool teachers' PsyCap was, it did not influence their perceived importance of their jobs in their lives and sense of value. However, Self and Opt helped them to meet their psychological needs at work.

Table 4 The regression analysis of preschool teachers' psychological capital on their job involvement N=385

Independent Variable		Dependent Variable	
		JI	WI
Psychological Capital (PsyCap)			
	Self	.158*	-.162
	Hope	.033	.041
	Opt	.377*	-.016
	Res	.136	.047
F		64.739*	1.300
P		.000	.270
Adj R ²		.403	.003

Note: The regression coefficients shown in the table are standardized β coefficients

* $p < .05$

4. Mediating Effects of Preschool Teachers' Psychological Capital

This study applied the hierarchical regression method to explore the mediating effects of the preschool teachers' PsyCap and referred to the argument by Baron and Kenny (1986) to verify that preschool teachers' EL significantly influences their JI through the mediating effect of their PsyCap.

Table 5 The regression analysis of the mediation effects preschool teachers' psychological capital on their emotional labor and job involvement N=385

Independent Variable		Dependent Variable			
		Job-in	PsyCap	Job-in	Job-in
		Model 1	Model 2	Model 3	Model 4
Emotional Labor (EL)					
	VE	.033	.389*		-.145
	REE	.025	.134*		.058
	SEA	.072	-.015		.080
	DEA	.498*	.363*		.350*
Psychological Capital (PsyCap)					
	Self			.090	.086
	Hope			.075	.004
	Opt			.334*	.423*
	Res			.162	.094
F		47.064*	150.397*	52.906*	55.438*
P		.000	.000	.000	.000
Adj R ²		.328	.568	.355	.413

Note: The regression coefficients shown in the table are standardized β coefficients

* $p < .05$

First, as shown in Models 1 and 2 of Table 5, the influence of the DEA construct of EL on JI ($\beta = .498$, $p < .05$) was significant, as were the influences of the VE, REE, and DEA constructs on PsyCap ($\beta = .389$, $p < .05$; $\beta = .134$, $p < .05$; $\beta = .363$, $p < .05$). These results verified the first step in the argument by Baron and Kenny (1986) that EL (independent variable) significantly influences JI (dependent variable) and PsyCap (intervening variable).

Second, as shown in Model 3 of Table 5, the influence of the Opt aspect of PsyCap on JI ($\beta = .334, p < .05$) was positive and significant. This result verified the second step from the argument by Baron and Kenny (1986) that PsyCap (intervening variable) significantly influences JI (dependent variable).

Third, as shown in Model 4 of Table 5, the influence of the DEA construct of EL on JI decreased from .498 to .350, and that of the Opt aspect of PsyCap on JI increased from .334 to .423. These results showed that the influence of DEA on JI was replaced by the influence of Opt, resulting in the decrease in the influence of DEA on JI in Model 4. In this case, the mediating effect of Opt was required to increase the influence on JI. Therefore, the hypothesis that preschool teachers' EL influences their JI through the mediating effect of their PsyCap, [H4], was supported.

CONCLUSION AND SUGGESTIONS

Adjusting Emotions Whilst Playing a Professional Role at Work Reduced Preschool Teachers' Perceived Job Value

Preschool teachers must cope with pressure from various sources. For example, they must interact with students, parents, and administrators. According to the categories defined by Hochschild (1983), preschool teachers engage in a high level of EL. Wu (2003) suggested that, when an employee performs EL at work, the main factor ensuring smooth completion of tasks is "taking job considerations seriously." Employees must follow regulations regarding the emotion adjustments required for their job positions to complete their tasks smoothly (the display rule) (Ekman, 1984; Ashforth & Humphrey, 1993). The findings of this study show that such job-focused EL (VE and REE) cannot be used to predict JI; in other words, the preschool teachers' self-belief could not be determined according to the role that they play in the job field. However, the predictive effect of EL on WI was negative. This result indicated that the more preschool teachers follow the rules of emotional expression for their professional role at work, the lower their perceived value of their job was. Furthermore, this phenomenon shows that, although preschool teachers engage in a high level of EL, the application of commoditization of emotions to their work requires further discussion, because when preschool teachers teach, they may evaluate their students' responses, and they may accept emotional loads higher than they would of their own free will. Previous studies have emphasized the fact that teachers voluntarily engage in emotional teaching practices according to their assessment of student responses, as opposed to the laborers that Hochschild describes, who are externally monitored by employers (Isenbarger & Zembylas, 2006; Oplatka, 2007). In relevant studies, both students and teachers reported receiving benefits from the teachers' management of emotions in the classroom. Finally, the task of teaching, as opposed to waitressing and other service tasks, involves long-term relationships with students, leading teachers to genuinely care for their students' learning.

Preschool Teachers' Sincere Emotional Expressions Can Facilitate Increasing Their Psychological Capital

Grandey (2000) believed that SEAs are an approach that employees use to exaggerate and control the expression of their emotions and serve as an emotional disguise whilst their true feelings remain unchanged. The results of this study results showed that the influence of the preschool teachers' SEAs on any of the four PsyCap variables was no significant. The exaggeration or control of emotions performed to meet requirements at their jobs or in their lives did not seem to be a desire of the preschool teachers. Although the preschool teachers' PsyCap was high, they had to accommodate multiple job facets at work. Consequently, the main purpose of their role did not take precedence and their role became unfocused. When the tasks to be performed for their role are unclear, their identification with their job might decrease (Chang & Hung, 2008). Expressing false emotions to please customers is not an easy task for preschool teachers. By contrast, the preschool teachers' DEAs could be used to predict the results for all four PsyCap variables. A DEA is an internalization process for emotional management that a person uses to change his or her emotional control model and accept organizational socialization and is initiated by adjusting the internal thinking and feeling systems of emotional control (Hochschild, 1983). A DEA requires applying additional effort to control true feelings.

Although preschool teachers had to bear loads of EL at work, their PsyCap was still quite high. This finding is consistent with the argument by Hargreaves (2001) that teachers may show various emotions in the course of their careers, including positive emotions such as love, caring, trust, and encouragement as well as negative emotions such as irritation, guilt, shame, anger, envy, and frustration. Bearing the same EL, some people can enjoy themselves, whereas others are in pain, acquiring various methods for coping (Hochschild, 1997). Although preschool teachers at work can use SEAs to pretend and please children and parents, SEAs do not facilitate increasing PsyCap. However, when preschool teachers sincerely change their internal processes of emotional control and address their EL wholeheartedly, their PsyCap increases, and the institutions which employ them benefit. This is one potential reason why the teachers remained enthusiastic.

Self-Efficacy and Optimism Can Facilitate Satisfying Preschool Teachers' Psychological Needs

People are the main conduit of all value conversions. PsyCap cannot be obtained outside a person; it results from a person's psychological state. PsyCap is the sum of a person's psychological resources beyond human capital and social capital. Systematic investment and development facilitating convert this active psychological state into a competitive advantage (Luthans, Avey & Avolio, 2006). The results of this study showed that all of the preschool teachers' scores for the four variables of PsyCap were high. The competitiveness of the teachers' internal positive resources was high. The Self and Opt aspects of PsyCap proved to be valuable influences on JI and were vital resources preschool teachers used to remain active and positive.

Optimism Mediates the Influence of Preschool Teachers' Emotional Labor on Their Job Involvement

The EL of the preschool teachers was high. They had to continually adjust and exaggerate their emotional expression. The adjustment of emotions by preschool teachers according to their personal roles led to a negative influence on their JI. Here, Opt played a mediating role, slightly increasing the preschool teachers' JI. Optimistic people regard their jobs with a degree of expectation. Optimistic employees can positively interpret future developments in their job fields, develop active emotions to widen their thinking and behavioral models, accept new concepts, and exert efforts to achieve innovative performance (Carr, 2004). One of this study's hypotheses is that preschool teachers' EL influences their JI through the mediating effect of PsyCap. Amongst the four factors of PsyCap, Opt was proven to have a mediating effect. Opt is a belief system involving positive expectations regarding the future as well as an active psychological state of PsyCap for interpreting work events in a positive direction according to surface characteristics (Luthans & Youssef, 2007). When preschool teachers devote themselves to their job, although it requires substantial amounts EL, they are often able to continue being devoted to and passionate in their work because of the effect of a particular psychological factor, their optimism.

REFERENCES

- Ashforth, B. E., & Humphrey, R. N.(1993). Emotional Labor in Service Roles: The Influence of Identity. *Academy of Management Review*, 18, 88-115.
- Avey, J. B., Patera, J. L., & West, B. J. (2006). The Implications of Positive Psychological Capital on Employee Absenteeism. *Journal of Leadership & Organizational Studies*, 13, 42-60.
- Avey, J., & Wernsing, T. S., & Luthans, F. (2008). Can Positive Employees Help Positive Organizational Change? Impact of Psychological Capital and Emotions on Relevant Attitudes and Behaviors. *The Journal of Applied Behavioral Science*, 44(1), 48-70.
- Bandura, A. (1991). Social Cognitive Theory of Self-Regulation. *Organizational Behavior and Human Decision Processes*, 50, 248-287.
- Baron R. M., & Kenny D. A. (1986) .The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.
- Brotheridge, C. M., & Grandey, A. A.(2002). Emotional Labor and Burnout: Comparing Two Perspectives of "People Work". *Journal of Vocational Behavior*, 60, 17-39.
- Brouwers, A., & Tomic, W. (2000). A Longitudinal Study of Teacher Burnout and Perceived Self-Efficacy in Classroom Management. *Teaching and Teacher Education*, 16, 239-253.
- Caires, S. & Almeida, LS.(2007). Positive Aspects of the Teacher Training Supervision: The Student Teachers' Perspective. *European Journal of Psychology of Education*, 22(4), 515-528.
- Carr, A. (2004). *Positive Psychology: The Science of Happiness and Human Strengths*. New York: Routledge.
- Carver, C. S., & Seligman, M. (2005). Optimism. In C.R. Snyder & S. J. Lopez (Eds.), *Handbook of Positive Psychology* (pp. 231-241). Oxford, UK: Oxford University.
- Chang, C. T. & Hung, C. C. (2008), Preschool Teachers' Emotional Labor: Context and Features. *Journal of Education Studies*, 42(2), 45-66.
- Chiang, W. T. (2002). Difficulties Teachers Encounter in Assessment Reform, *Journal of Education Research*, 93, 108-115
- Chung, H. K.(2009). *The Relativity between Workplace Spirituality and Psychological Ownership : The Mediating Effect of Psychological Capital*. Graduate Institute of Department of Logistics Management. Management College, National Defense University. New Taipei City, Taiwan.
- Department of Statistics, Ministry of Education (2014). *Numbers of preschool teachers of public and private preschools in Taiwan*, <https://stats.moe.gov.tw/result.aspx?qno=MQAZAA2>. Accessed 01 Jan 2014.
- Ekman, P.(1984). Expression and the Nature of Emotion. In K.R. Scherer & P. Ekman(Eds.), *Approach to Emotion* (pp.319-343). Hillsdale, NJ: LEA.
- Fu, C.S. (2011). *To Explore Academic Emotion and Structure Model Verify for Child Care and Educational Intern*. Doctoral dissertation, Graduate Institute of Education, National Cheng Kung University, Taiwan.
- Grandey, A. A.(2000). Emotional Regulation in the Workplace: A New Way to Conceptualize Emotional Labor.

- Journal of Occupational Health Psychology*, 5(1), 95-110.
- Hackman, J. R. & Lawler, E. E. (1971) Employees Reactions to Job Characteristics. *Journal of Applied Psychology*, 55, 259-286
- Hargreaves, A. (1998). The Emotional Practice of Teaching. *Teaching and Teacher Education*, 14(8), 835- 854.
- Hargreaves, A. (2001). Emotional Geographies of Teaching. *Teachers College Record*, 103(6), 1056- 1080.
- Heck, S.F. & Williams, C.R. (1984). *The Complex Roles of the Teacher: An Ecological Perspective*. Teachers College Press, UK.
- Hochschild, A. R. (1997). When Work Becomes Home and Home Becomes Work. *California Management Review*, 39(4), 79- 97.
- Hochschild, A. R. (1983). *The Managed Heart*. Berkely, CA: University of California Press.
- Huang, C. W. (2009). *The Study of Psychological Capital and Organizational Citizenship Behavior of the Elementary School Teachers in Yunlin County*. Graduate Institute of Elementary and Secondary Education National Chiayi University, Taiwan.
- Isenbarger, L., & Zembylas, M. (2006). The Emotional Labor of Caring in Teaching. *Teaching and Teacher Education*, 22, 120-134.
- Jensen, S. M., & Luthans, F. (2006). Relationship between Entrepreneurs' Psychological Capital and Their Authentic Leadership. *Journal of Managerial Issues*, 18, 254-273.
- Johnson, S., Cooper, C., Cartwright, S., Donald, I., Taylor, P., & Millet, C. (2005). The Experience of Work Related Stress across Occupations. *Journal of Managerial Psychology*, 20, 178-187.
- Kahn, W. A. (1990). Psychological Conditions of Personal Engagement and Disengagement at Work. *Academy of Management Journal*, 33(4), 692-724.
- Kamerman, S.B. (2000). Early Childhood Education and Care: An Overview of Developments in the OECD Countries. *International Journal Educational research*, 33(1), 7-29.
- Kanungo, R.N. (1982). Measurement of Job and Work Involvement. *Journal of Applied Psychology*, 67, 341-350.
- Krejcie, R.V., & Morgan, P. W. (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement*, 30, 607-610.
- Lawler, E. E. & Hall, D. T. (1970). Relationship and Job Characteristics to Job Involvement, Job Satisfaction and Intrinsic Motivation. *Journal of Applied Psychology*, 54, 305-312.
- Lee, H. M. & Chen, M. T. (2006). The Factorial Structure of Preschool Teachers' Emotional Labor and Its Influence on Job Burnout. *Kaohsiung Normal University Journal*, 20, 67-90.
- Lee, H.M. (2009). Preschool Teachers' Psychological Capital and Its Potential Association between Job Performance. *Journal of Child Care*, 7, 1-24.
- Lee, R. T. & Ashforth, B. E. (1996). A meta-analytic examination of the correlates of the three dimension of job burnout. *Journal of Applied Psychology*, 81, 123-133.
- Lin, M. H., Tsai, C. M. (2002). Future Visions and Lessons of Kindergarten's Teacher Career Ladder. *Bulletin of Research on Elementary Education*, 42(5), 5-17
- Lin, S.P. (2000). A Study of the Development of Emotional Labor Loading Scale. *Sun Yat-Sen Management Review*, 39(8), 427-447.
- Lodahl, T. M., & Kejner, M. (1965). The Definition and Measurement of Job Involvement. *Journal of Applied Psychology*, 49(1), 24-33.
- Lord, R.G., Harvey, J.L. (2002). *An Information Processing Framework for Emotion, in Emotions in the Workplace*. Edited by Robert G. Lord, Richard J. Klimoski & Ruth Kanfer, San Francisco: Jossey-Bass.
- Luthans, F., Youssef, C. M., & Avolio, B. J. (2007). *Psychological Capital*. Oxford, UK: Oxford University Press.
- Luthans, F., & Youssef, C. M. (2007). Emerging Positive Organizational Behavior. *Journal of Management*, 33, 321-349.
- Luthans, F., Avey, J. B., & Avolio, B. J. (2006). Psychological Capital Development: Toward a Micro-Intervention. *Journal of Organizational Behavior*, 27, 387-393.
- Luthans, F., Avolio, B. J., Avey, J. B., & Norman, S. M. (2007). Positive Psychological Capital: Measurement and Relationship with Performance and Satisfaction. *Personnel Psychology*, 60, 541-572.
- Luthans, F., Luthans, K.W., & Luthans, B. C. (2004). Positive Psychological Capital: Beyond Human and Social capital. *Business Horizons*, 47, 45-50.
- Mark, J. H., & Anderson, B. D. (1987). Teacher Survival Rates-A Current Look. *American Education Research Journal*, 15(3), 397-383.
- Maslach C, Schaufeli W. B. & Leiter M.P. (2001). Job Burnout. *Annual Review of Psychology*, 52, 397-422
- May D. R., Gilson R. L. & Harter L.M. (2004). The Psychological Conditions of Meaningfulness, Safety and Availability and the Engagement of the Human Spirit at Work. *Journal of Occupational & Organizational Psychology*, 77(1), 11-37.

- Morris, J.A., Feldman D.C.(1996). The Dimensions, Antecedents and Consequences of Emotional Labor. *Academy of management review*, 21(4), 986-1010.
- Näring, G., Briet, M., & Brouwers, A. (2006). Beyond Demand-Control: Emotional Labor and Symptoms of Burnout in Teachers. *Work & Stress*, 20(4), 303-315.
- Op't Eynde, P., & Turner, J. E. (2006). Focusing on the Complexity of Emotion Issues in Academic Learning: A Dynamical Component Systems Approach. *Educational Psychology of Review*, 18, 361-376.
- Oplatka, I. (2007). Managing Emotions in Teaching: Toward an Understanding of Emotion Displays and Caring as Nonprescribed Role Elements. *Teachers College Record*, 109 (6), 1374-1400.
- Pajares, F. (1996). Self-Efficacy Beliefs in Academic sSetting. *Review of Educational Research*, 66(4),543-545.
- Pakarinen, E., Kiuru, N., Lerkkanen, MK., Poikkeus, AM., Siekkinen, M., & Nurmi, JE.(2010). Classroom Organization and Teacher Stress Predict Learning Motivation in Kindergarten Children. *European Journal of Psychology of Education*, 25(3), 281-300.
- Peterson, S. J., Luthans, F., Avolio, B. J., Walumbwa, F. O., & Zhang, Z. (2011). Psychological Capital and Employee Performance: A Latent Growth Modeling Approach. *Personnel Psychology*, 64, 427-450.
- Pugh, S. D. (2001). Service with a Smile: Emotional Contagion in the Service Encounter. *Academy of Management Journal*, 44, 1018-1027.
- Robinowitz S. & Hall D. T. (1977), "Organizational Research on Job Involvement". *Psychological Bulletin*, 84, 265-288.
- Roulston, K. (2004) . An Investigation of Music Teacher's Work in Changing Times. *Journal of Educational Chang*,5(1), 31-56.
- Ryan, R. M., & Deci, E. L. (2001). On Happiness and Human Potentials: A Review of Research on Hedonic and Eudemonic Well-Being. *Annul Review of Psychology*, 24(4), 422-429.
- Schaufeli, W. B., Salanova, M., González-Romá, V., & Bakker, A. B. (2002).The Measurement of Engagement and Burnout: A Two Sample Confirmatory Factor Analytic Approach. *Journal of Happiness Studies*, 3, 71-92.
- Scheier , M. F. & Carver, C. S. (1985). Optimism, Coping and Health: Assessment and Implications of Generalized Outcome Expectancies. *Health Psychology*, 4 , 219-247.
- Seligman, M. (2012). *Teaching Well-Being in Schools*.
<http://www.authentic happiness.sas.upenn.edu/newsletter.aspx?id=1551>. Accessed 16 Mar 2012.
- Snyder, C. R., Lopez, S. J., Shorey, H. S., Rand, K. L., & Feldman, D. B. (2003). Hope Theory, Measurements, and Applications to School Psychology. *School Psychology Quarterly*, 18 (2), 122-39.
- Tasi, H.H.(2007). *The Relationship among Emotional Labor, Emotional Intelligent, and Job Satisfactions for the Kindergarten Teachers in Taichung*. Department of Youth and Child Welfare, Providence University. Master Thesis.
- Wharton, A. S. (1993). The Affective Consequences of Service Work: Managing Emotions on the Job. *Work and Occupations*, 20(2), 205-232.
- Wharton, A. S., & Erickson, R. J. (1995). The Consequences of Caring: Exploring the Links between Women's Job and Family Emotion Work. *Sociological Quarterly*, 36(2), 273-296.
- Wu, T.Y.(2003). *Emotional Labor at Work : Development of Concept, Analysis of Related Variables, and Exploration of Psychological Process Issues*. Doctoral dissertation, Graduate Institute of Psychology, National Taiwan University.
- Wu, T.Y., Cheng, B.S.(2006) The Effect of Interactions among Job Involvement, Ability of Regulating Other's Emotion, and Emotional Labor on Emotional Exhaustion. *Chinese Journal of Psychology*,48(1).69-87.
- Wu, Z.S.(2010). *The Relationships among Life Stress, Psychological Capital, and Depression of College Students*. Graduate Institute of Education. National Chengchi University, Taipei, Taiwan.

The Effect of Play Supported Program on the School Readiness of 60-72 Month-Old Disadvantaged Children^{ab}

Özgül Polat

^cMarmara University, Goztepe Campus, Kadikoy – Istanbul, 34722, Turkey

Ayşegül Sönmez^d

^dToki Kardelen Preschool, Kucukcekmece, Istanbul, Turkey

^a It was taken from the thesis titled "The effect of play supported program designed for 60-72 month-old disadvantaged children on their readiness level for primary school education".

^b This article was produced from EGT-D-130515-0238 numbers project which is supported by University of Marmara: BABKO Department

ABSTRACT

The aim of this research is to examine the effect of The Play supported Program designed for 60-72 month-old disadvantaged children on their readiness levels. The sample of the research has consisted of an experimental group and a control group, each having twenty 60-72 months old children (10 girls and 10 boys) at Göztepe Semiha Şakir Children's Home, an institution under the Turkish Republic Social Services and Society for the Protection of Children in Kadıköy Istanbul during 2010-2011 Academic Year. Research was designed according to pretest-posttest control group model. The Play Supported Program was prepared for the 60-72 month-old disadvantaged children and the training program has been carried out with the experimental group. The control group was not given an extra program. The development and application forms of "Marmara Primary School Education Readiness Scale", which was developed and standardized by Polat Unutkan in 2003, have been used to gather data in the research. The results of the research show that there are significant differences in the favor of experiment group on the aspects of Mathematics, Science, Audio Capabilities, Cognitive and Language Development, Social and Emotional Development, Physical Development, and Self-Care Skills.

Keywords: School Readiness, Disadvantaged Children, Play Supported Program of School Readiness, Social Services and Society for the Protection of Children.

INTRODUCTION

There is a high number of children that need protection in Turkey. According to the data given by the Directorate General of Children's Services under the Ministry of Family and Social Policies in December 2014, the number of children in Turkey are 101.607 (<http://cocukhizmetleri.aile.gov.tr>). The sufficiency of services provided is debatable (Şimşek, Erol, Öztıp, and Özcan, 2008). Due to the factors such as lack of family and negative environmental conditions, children growing up under institutional care, suffer from cognitive, physical, emotional, and social developmental regression and deterioration. Problems for such disadvantaged children are more than just finding accommodation or meeting their clothing or nourishment needs (Fidan, 2005; Şimşek et. al., 2008). According to the results of comparative studies conducted on children who grow up in institutions versus those that grow up with their families, the former frequently suffer from problems with agreement, cooperating, and empathizing (Sloutsky, 1997) that play a major role in social life and family environment; they demonstrate behavioral problems that may continue during their schooling such as attention problems, hyperactivity, and impulsivity (MacLean, 2003); stereotypical behavioral problems such as rocking, and thumb sucking (Yörükoğlu, 1968); have problems with success at school, talent developing, and extracurricular activities (Tuzcuoğlu, 1989) in addition to low cognitive performance, inability to participate in social or emotional transactions, failure to think in correct concepts and terms, getting stuck in details, inability to pass from material world to abstract world with reason and imagination. Children that grow up in institutions fall behind development even though they are well taken care of under good health conditions (Çörüş & Arık, 1999; Kırpınar & Ceyhun, 2013).

Özdemir, Sefer, and Türkdoğan (2008) emphasize the significance of individuals to take social responsibility in the current system to prepare and apply additional programs that would support emotional, social, cognitive, language, and psychomotor development of such disadvantaged children who live in children's homes and need protection. Disadvantaged children need Primary School Readiness Support Programs to make an equal start to primary school with other children. A number of studies concluded that children at low socio-economical level have low literacy (Oktay, 1983) and primary school readiness levels (Baldwin, 2011; Gonca, 2004; Isaacs and Magnuson, 2011; Polat Unutkan, 2006a; Polat Unutkan, 2006b; Polat Unutkan, 2007; Telegdy, 1974). This is

very important for ‘Children that Need Protection’ who suffer many losses in their lives and who are devoid of maternal love and care.

Preparing effective support programs along with qualified staff and rich and stimulant environmental are required to ensure disadvantaged children who are taken care of at institutions so for them to have equal primary school readiness skills as their counterparts and this is the most important obligation of ‘accepting right to education of the children and granting this right on equality of opportunity basis’ principle emphasized at that Article 28 of Convention on the Rights of the Children (<http://www.unicef.org/turkey>). In the light of results of current research, it can be argued that disadvantaged children need programs prepared with different methods and techniques especially to compliment preschool education. In this context, the aim of this study is to examine the impact of ‘Preschool Play supported Program Prepared for 60-72 Month-Old Disadvantageous Children’ on primary school readiness levels of such children.

THE STUDY

Design of the study is pretest-posttest control group model. Participants are a total of 40 socially disadvantaged 60-72 months old children getting education at two classes of Göztepe Semiha Şakir Children’s Home in Kadıköy district of Istanbul, in 2010-2011 Academic Year. 20 children (10 boys and 10 girls) were randomly assigned to test group and 20 children (10 boys and 10 girls) were randomly assigned to control group.

DATA COLLECTION TOOLS

Two data collection tools were used in the study. The first one is personal information form. The other tool is “Marmara Primary Education Readiness Scale” (MPERS) which was developed and standardized by Polat Unutkan in 2003 for 60-78 month-old Turkish children. The scale is composed of two parts as Development and Application forms. Development Form of MPERS has a total of 153 items, which consists of 4 sub-scales as cognitive and language (74 items), socio-emotional (40 items), physical development (23 items), and self-care skills (16 items) and is filled out by teachers or parents. In this study, teachers filled out development forms. Test-retest reliability (continuity coefficient) of development form was determined as $r = .99$. Internal consistency coefficient (cronbach alpha) was determined as $r = .98$. As validity study, its factor structure was established with factor analysis. Internal consistency-cronbach alphas of sub-scales of the development form used in this research were determined as; cognitive and language $r = .97$, socio-emotional $r = .94$, physical development $r = .89$, and self-care skills $r = .80$.

Application Form of Marmara Primary Education Readiness Scale used in this study has 5 sub-scales as mathematics (46 questions), science (14 questions), sound (8 questions), drawing (3 questions), and labyrinth (2 questions). Application Form is composed of 73 questions with pictures. Application form is individually applied to children. In this study application form was applied to each child by the researcher. Test-retest reliability (continuity coefficient) of application form was determined as $r = .93$, $p < 0.01$. Internal consistency coefficient (cronbach alpha) is $r = .93$, $p < 0.01$. As validity study, its factor structure is established with factor analysis. Internal consistency-cronbach alphas of sub-scales of the application form used in this research were determined as mathematic studies $r = .96$, $p < 0.01$, sound studies $r = .88$, $p < 0.01$, science studies $r = .86$, $p < 0.01$, drawing studies $r = .81$, $p < 0.01$, and labyrinth studies $r = .95$, $p < 0.01$.

THE PLAY SUPPORTED PROGRAM

In the study, ‘Play Supported Program for Primary School Readiness of 60-72 Month-Old Disadvantaged Children’ was developed by the researcher to increase primary school readiness levels of children. Education program was prepared in accordance with children’s developmental characteristics and in the scope of goals and objectives in preschool education program developed in 2006 for 36-72 month-old children. Goals and objectives were selected from cognitive and language development, socio-emotional development, physical development, and self-care skills and then developmentally appropriate activities were prepared for each development areas. Application of education program was planned to last for eight months during 2010-2011 education year on school days between September and May and as three play activities per day. The target of the games prepared in ‘Primary School Readiness Play supported Program for 60-72 Month-Old Disadvantaged Children’ was to make sure that children learn by having fun; thus, all activity types are presented with games. The draft of the program was carefully analyzed and altered by 5 experts according to the goals, objectives and study. The experts incorporated incorporating a primary school readiness program with play activities. Following revisions on the education program was made and the program was given its final shape. The duration of the education program is planned to be eight months during 2010-2011 education year during school days in between September and May by three play activities per day.

FINDINGS

According to pretest results of children in test and control groups, no significant difference was found between MPERS Mathematics ($U=184,500 - p>0,05$), Science ($U=193,000 - p>0,05$), Sound ($U=200,000 - p>0,05$), Labyrinth ($U=137,500 - p>0,05$) sub-scale scores and Application total score ($U=151,000 - p>0,05$). Contrary to these findings, there was a significant difference in total Drawing sub-scale scores between children in test and control groups ($U=122,000 - p<0,05$). This difference was found to be in favor of experiment group. Again according to pretest results of children in experiment and control groups, no significant difference was found between Socio-Emotional Development ($U=198,500 - p>0,05$), Physical Development ($U=169,500 - p>0,05$), Self-Care Skills ($U=166,000 - p>0,05$) sub-scale scores and Development total score ($U=144,000 - p>0,05$). Contrary to these findings, a significant difference was found between Cognitive-Language Development sub-scale scores ($U=126,500 - p<0,05$) and this difference was found to be in favor of experiment group.

A significant difference was found between MPERS Application Form Mathematics ($z=-3,925 - p<0,05$), Science ($z=-3,933 - p<0,05$), Sound ($z=-3,948 - p<0,05$), Drawing ($z=-3,825 - p<0,05$), Labyrinth ($z=-3,666 - p<0,05$) sub-scale scores and Application total ($z=-3,930 - p<0,05$) scores of children in experiment group. This difference was found to be in favor of posttest scores of experiment group. In addition to this finding, a significant difference was found between MPERS Development Form Cognitive-Language Development ($z=-3,921 - p<0,05$), Socio-Emotional Development ($z=-3,925 - p<0,05$), Physical Development ($z=-3,925 - p<0,05$), Self-Care Skills ($z=-3,927 - p<0,05$) sub-scale scores and Development total ($z=-3,921 - p<0,05$) scores of children in experiment group. This difference was found to be in favor of posttest scores of test group.

A significant difference was found between MPERS Application Form Mathematics ($z=-3,926 - p<0,05$), Science ($z=3,949 - p<0,05$), Sound ($z=-3,407 - p<0,05$), Drawing ($z=3,919 - p<0,05$), Labyrinth ($z=-3,592 - p<0,05$) sub-scale scores and Application total ($z=-3,927 - p<0,05$) scores of children in control group. This difference was found to be in favor of posttest scores of control group. Similarly, a significant difference was found between MPERS Development Form Cognitive-Language Development ($z=-3,921 - p<0,05$), Socio-Emotional Development ($z=-3,922 - p<0,05$), Physical Development ($z=-3,931 - p<0,05$), Self-Care Skills ($z=-3,924 - p<0,05$) sub-scale scores and Development total ($z=-3,921 - p<0,05$) scores of children in control group. This difference was found to be in favor of posttest scores of control group.

A significant difference was found between MPERS Mathematic ($U=1,500 - p<0,05$), Science ($U=26,000 - p<0,05$), Sound ($U=3,000 - p<0,05$), Drawing ($U=99,500 - p<0,05$) sub-scale scores and Application total scores ($U=2,000 - p<0,05$) of children in experiment and control groups. Contrary to these findings, no statistically significant difference was found between MPERS Labyrinth sub-scale scores of children in experiment and control groups ($U=150,000 - p>0,05$). Statistically significant differences were also found between MPERS Development Form Cognitive-Language Development ($U=,000 - p<0,05$), Socio-Emotional Development ($U=,000 - p<0,05$), Physical Development ($U=,000 - p<0,05$), Self-Care Skills ($U=6,000 - p<0,05$) sub-scale scores and Development total scores ($U=,000 - p<0,05$) of children in experiment and control groups. This difference was found to be in favor of posttest scores of experiment group.

CONCLUSIONS

In conclusion, socially disadvantaged children who participated in this study in the experimental group were found to have higher primary school readiness skills than those children in the control group. When the relevant literature is studied, it can be found that play supported programs have a positive influence on developing children's language (Ahioğlu, 1999; Kavsaoğlu, 1990; Lyytinen, Poikkeus & Laakso, 1997), psychomotor skills (Özdenk, 2007), and social skills (Durualp and Aral, 2010); in fact, play supports all development areas in children (Ömeroğlu, 1992) and children themselves ascribe great importance to it (Santo, 2006). According to the study carried out by Taylor, Gibbs and Slate (2000), children under risk from low socio-economic and diverse ethnic backgrounds participating in Georgia Preschool Education Program are positively influenced from their preschool experiences in terms of school maturity skills. These findings were also supported by a number of studies that revealed benefits of preschool education on academic and intellectual development of children under risk.

When we consider that the 'Play supported Program for Primary School Readiness of 60-72 Month-Old Disadvantaged Children' used in this study was prepared using play method, the positive development in primary school readiness skills of children in the experiment group proved the program's effectiveness. Also when results of studies that test the effectiveness of programs prepared with different methods and techniques, it can be noted that programs that supplement the Ministry of Education Preschool Education Program currently in use lead to positive developments on children's writing awareness (Aktan Kerem, 2001; Breit-Smith et. al., 2009; Edmonds et. al., 2009; Mol, Bus, and Jong, 2009), language development (Yayla, 2003) and sentence and

number maturity skills (Turhan, 2004). It can be argued that play as the basis of the program applied in this study and the fact that play enables children to learn by having fun, gaining first-hand experiences, and playing an active role in their learning lead to an increase in primary school readiness scores of children in experiment group. If we look at the results of the study conducted by Dilli (2013), the total scores of children in experimental group in the areas such as mathematics, science, sound, cognitive-language, socio-emotional, physical, self-care skills development and application and development, were all found to be higher than the scores of children in the control group of 'Play supported Program for Primary School Readiness of 60-72 Month-Old Disadvantageous Children'.

The reasons why primary school readiness scores of children in the control group differ significantly in favor of their posttest scores can be the positive impact preschool education on children's development (Atılğan, 2001; Bilecen, 1995; Ekinci, 2001; Damarlıoçak, 2007; Dinç, 2003; Gonca, 2004; Kılıç, 2008; Özbek, 2003; Öztürk, 1995; Uğur, 1998; Smith, Simmons, and Kameenui, 1995; as cited in Fitzsimmons, 1998; Seçilmiş, 1996; Taner, 2003; Tamkavas, 2003; Yangın, 2007) and the nature of development itself. In addition, the previous research demonstrated that children who receive preschool education have a higher level of primary school readiness compared to children who do not receive such education even when they have disadvantaged backgrounds (Erkan & Kırca, 2010; Pehlivan, 2006; Polat Unutkan, 2003; Polat Unutkan & Oktay 2004; Yeşil, 2008; Yılmaz & Dikici-Sığırtaç, 2008) and have a higher level of cognitive thinking skills (Polat Unutkan, 2006b). Also, preschool education increases primary school readiness cognitively and supports children to achieve an easier socio-emotional adjustment to school (Turaşlı, 2006). Mathematical skills and academic success of children who receive preschool education such as attention-memory, number recognition, adding-subtracting (Polat Unutkan, 2007; Dursun, 2009); are also higher than those who do not receive such education (Anderson, 1994; Arı, Üstün and Akman, 1994; Arı, Üstün, Akman, and Etikan, 2000; Başer, 1996; Dağlı, 2007; Ergün, 2003; Tuğrul, 1992). The study conducted by Kmak (2010) proved that as years of preschool attendance increased, literacy skills in preschool also improved. In addition to all these studies, Uyanık Balat (2003) aimed to bring forward basic conceptual information of children in need of protection and children who live with their families. In this study, there was a significant difference in conceptual scores between children who could not attend preschool and children who could attend preschool for one year, two, and more years. As the duration of preschool education increases, the mean scores of children also increase. This result is in parallel to relevant studies and it brings forward the importance of preschool education.

This study conducted by the researcher revealed results that are relevant for researchers and educators, and the following suggestions are developed under the light of these findings:

- Effectiveness of this program prepared by the researcher should be tested with various samples and results of those studies should be compared with results of this study.
- The overall development of children in experiment group whose first grade readiness levels were supported with this study should be tracked throughout primary school to investigate the sustainability of the program.
- New studies that investigate the joint effect of support programs prepared for disadvantaged children should be conducted and diverse variables (gender, age, time spent at institution) on the first grade readiness levels of children should be regarded.
- Research that compares the impact of first grade readiness support programs on disadvantaged children and their non-disadvantaged counterparts can be planned.
- Results of this study and other relevant studies should be investigated by the relevant institutions so that necessary precautions can be taken to support an equal start to the first grade by disadvantaged children with their counterparts.

REFERENCES

- Ahioglu, E. N. (1999). *Sembolik oyunun 4 yaş çocuklarının dil kazanımına etkisi (Impact of symbolic play on language development of 4 year-old children)*. (Unpublished Master Thesis), Ankara University, Social Sciences Institute, Ankara.
- Aktan Kerem, E. (2001). *Okul öncesi dönem çocuklarında okuma gelişimi ve okumaya hazırlık programının etkisinin değerlendirilmesi (Evaluation of literacy development and the impact of literacy preparation program on pre-school children)*. (Unpublished PhD Thesis), Marmara University, Institute of Education Sciences, İstanbul.
- Anderson, G. R. (1999). Introduction: achieving permanency for all children in the child welfare system. *Journal of Multicultural Social Work*, 5(1/2), 1-8.
- Arı, M., Üstün, E., & Akman, B. (1994). 4-6 yaş anaokuluna giden ve gitmeyen çocukların kavram gelişimlerinin karşılaştırılması (Comparison of concept development at 4-6 year-old children who attend

- preschool versus children who do not). *10. YA-PA Okul Öncesi Eğitimi ve Yaygınlaştırılması Semineri (The 10th YA-PA Seminar on Preschool Education and Its Generalization)*. Ankara: Ya-Pa Publishing.
- Arı, M., Üstün, E., Akman, S., and Etikan, İ. (2000). 4-6 yaş grubu çocuklarda kavram gelişimi (Concept development at 4-6 year-old children) . *Gazi University Industrial Arts Education Faculty Magazine*, 8, 5-18.
- Atılğan, G. (2001). *Okul öncesi eğitim kurumlarına devam eden ve etmeyen ilköğretim 1.kademe 1. devre öğrencilerinin sosyal beceri özelliklerinin karşılaştırılması (Comparison of social skills of children at first semester of first grade who attended preschool versus children that did not)*. (Unpublished Master Thesis), Selçuk University, Konya.
- Balat Uyanık, G. (2003). *Altı yaş grubu korunmaya muhtaç ve ailesinin yanında kalan çocukların okula hazır bulunuşluk ile ilgili temel kavram bilgilerinin karşılaştırılması (Comparison of basic conceptual information regarding primary school readiness of children in need of protection versus children that live with their families)*. (Unpublished PhD Thesis), Hacettepe University, Health Sciences Institute, Ankara.
- Baldwin, C. N. (2011). *School Readiness: Parent perceptions, behaviors, and child ability related to ethnicity and socioeconomic status*. (Unpublished Master Thesis), The Faculty of the Department of Psychology, Western Kentucky University, Bowling Green.
- Başer, G. (1996). *Anasınıfı eğitimi alan ve almayan ilköğretim birinci sınıf öğrencilerinin akademik başarılarının karşılaştırılması (Comparison of academic successes of first grade students who attended preschool versus those that did not)*. (Unpublished Master Thesis). Gazi University, Ankara.
- Bilecen, N. (1995). *Birinci sınıfın etkilerine ulaşmada anasınıfına devam etme veya etmemenin etkisi (Impact of preschool attendance on achieving effects of first grade)*. (Unpublished Master Thesis). Balıkesir University, Balıkesir.
- Breit-Smith, A., Justice, L. M., McGinty, A.S., & Kaderavek J. (2009). How often and how much? Intensity of print referencing intervention. *Topics in Language Disorders*, 4, 360–369.
- Convention on the Rights of the Children*, http://www.unicef.org/turkey/crc/_cr23d.html reached on: April 23rd, 2013.
- Çörüş, G., & Arık, İ. A. (1999). *Farklı ortamlarda bilişsel gelişim, İstanbul 1. çocuk kurultayı bildiriler kitabı (Cognitive development in different environments, İstanbul 1st Congress on Children Declaration (M.R. Şirin, S.U. Sayita), p.319-328, İstanbul Çocukları Vakfı Publishing, 1999, İstanbul*.
- Dağlı, A. (2007). *Okul öncesi eğitimi alan ve almayan ilköğretim birinci sınıf öğrencilerinin türkçe ve matematik derslerindeki akademik başarılarının karşılaştırılması (Academic success at Turkish and mathematics classes of first grade students that attended preschool versus those that did not)*. (Unpublished Master Thesis), Selçuk University, Social Sciences Institute, Konya.
- Damarlıoçak, S. (2007). *İlköğretim birinci sınıf öğrencilerinin dil gelişim düzeyleri ile okuma-yazma başarıları arasındaki ilişki (The relationship between language development and literacy success of first grade students)*. (Unpublished Master Thesis). İstanbul: Marmara University.
- Dilli, F. (2013). *60-72 Aylık sosyal açıdan dezavantajlı çocuklar için hazırlanan ilköğretime hazırlık destek programının çocukların ilköğretime hazırlanışlarına etkisi (The impact of primary school readiness support program prepared for 60-72 month-old disadvantaged children on primary school readiness)*. (Unpublished Master Thesis), Marmara University, İstanbul.
- Dinç, B. (2002). *Okul öncesi eğitimin 4-5 yaş çocuğunun sosyal gelişimine etkileri konusunda öğretmen görüşleri (Teachers' opinions on the impact of preschool education on social development of 4-5 year-old children)*. (Unpublished Master Thesis), Anadolu University, Education Sciences Institute, Eskişehir.
- Durualp, E. & Aral, N. (2010). *Altı yaşındaki çocukların sosyal becerilerine oyun temelli sosyal beceri eğitiminin etkisinin incelenmesi (Studying the impact of play supported social skills education on social skills of six year-old children)*. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi (H. U. Journal of Education)*, 39,160-172.
- Edmonds, E., O'Donoghue, C., Spano, S., & Algozzine, R. F. (2009). Learning when school is out. *The Journal of Educational Research*, 102 (3), 213-221.
- Ekinci, O. (2001). *Okul öncesi eğitimin ilköğretim birinci sınıf öğrencilerinin başarıları üzerine etkisi (The impact of preschool education on success of first grade students)*. (Unpublished Master Thesis), Gaziantep: Gaziantep University.
- Ergün, S. (2003). *Okul öncesi eğitim alan ve almayan ilköğretim birinci sınıf öğrencilerinin matematik yetenek ve başarılarının karşılaştırmalı olarak incelenmesi (Comparative study of first grade students who attended preschool versus those that did not in terms of mathematics abilities and success)*. (Master Thesis). İstanbul: Marmara University.
- Fidan M. (2005). *Sosyal hizmetler çocuk esirgeme kurumu çocuk yuvalarında barınan çocukların wisc-r skorlarının değerlendirilmesi (Evaluating wisc-r scores of children that live at children's homes)*. (Unpublished Master Thesis), İstanbul University, Institute of Forensic Sciences, İstanbul.

- Fitzsimmons, M. K. (1998). Beginning Reading, Eric Clearinghouse on Disabilities and Gifted Education, Reston, <http://www.ldonline.org/article/6281>.
- Gonca, H. (2004). *Ankara il merkezinde farklı sosyo-ekonomik ve kültürel ortamlarda yetişen ve ilköğretim okuluna yeni başlayan çocukların okul olgunluğunun incelenmesi (Studying school maturity of children from different socio-economic and cultural backgrounds who start primary school at Ankara center)*. (Unpublished Master Thesis), Hacettepe University, Health Sciences Institute, Ankara. <http://cocukhizmetleri.aile.gov.tr/data/544e2899369dc318044059c3/Aral%C4%B1k.pdf>
- Julia B. Isaacs and Katherine Magnuson (2011). *Income and Education as Predictors of Children's School Readiness, the social genome project*. http://www.brookings.edu/~media/research/files/reports/2011/12/15%20school%20readiness%20isaacs/1214_school_readiness_isaacs.pdf
- Kavsaoğlu, S. Z. (1990). *1,5-2,0 ve 4,5-5,0 yaş çocuklarında oyun yöntemi ile büyük-küçük ve uzun-kısa kavramlarının işlev ve dil düzeylerinde değerlendirilmesi (Evaluating in terms of function and language of big-small and tall-short concepts with play method at 1,5-2,0 and 4,5-5,0 year-old children)*. (Unpublished Master Thesis), Hacettepe University, Health Sciences Institute, Ankara.
- Kılıç, Z. (2008). *İlköğretim birinci sınıf öğretmenlerinin görüşlerine göre okul öncesi eğitim alan ve almayan öğrencilerin gelişim becerilerinin karşılaştırılması (A comparison by first grade teachers of developmental skills of children that attend preschool versus those that do not)*. (Unpublished Master Thesis), Beykent University, Social Sciences Institute, Istanbul.
- Kırca, A., & Erkan, S. (2010). Okul öncesi eğitimin ilköğretim birinci sınıf çocuklarının okula hazırbulunuşlarına etkisinin incelenmesi (Examining the impact of preschool education on school readiness levels of first grade students). *Hacettepe University Education Faculty Magazine*, 38, 94-106.
- Kırpınar, İ., & Ceyhun, H. (2013). Erzurum Çocuk Yuvası 0-6 yaş biriminde kalan çocukların sosyo-demografik özellikleri, davranışsal sorunları ve gelişim düzeyleri (Socio-demographic characteristics, behavioral problems and developmental levels of children who live at Erzurum Children's Home 0-6 age group). *Konuralp Medicine Magazine*, 5(2), 17-21
- Kmak, J. A. (2010). *Kindergarten literacy skills and their relationship to the type of preschool experience*. Unpublished doctoral thesis, Aurora University: USA.
- Lyytinen, P., Poikkeus, M., & Laakso, M. L. (1997). Language and symbolic play in toddlers. *International Journal of Behavioral Development*, 21 (2) , 289-302
- Maclean, K. (2003). The Impact of Institutionalization. *Development and Psychopathology*, 15, 853-884.
- Mol, S. E., Bus, A. G., & Jong M. T. (2009). Interactive book reading in early education: a tool to stimulate print knowledge as well as oral language. *Review of Educational Research*, 79(2), 979-1007.
- Oktay, A. (1983). *Okul olgunluğu (School maturity)*. Istanbul University Education Faculty Publishing No: 3089: Istanbul.
- Ömeroglu, E. (1992). *Çocuk ve Oyun (Children and Games)*. Republic of Turkey Family Research Institution. Ankara: Kiliçarslan Publishing.
- Özbek, A. (2003). *Okul öncesi eğitim kurumlarına devam eden ve etmeyen çocukların ilköğretim birinci sınıfta sosyal gelişim açısından öğretmen görüşüne dayalı olarak karşılaştırılması (Comparison of children who attend preschool versus those that do not in terms of social development at first grade based on teacher's opinion)*. (Unpublished Master Thesis), Anadolu University, Eskişehir.
- Özdemir, N., Sefer, N., & Türkdoğan, D. (2008). Bir sosyal sorumluluk projesi örneği: korunmaya muhtaç çocuklar (A social responsibility example: children in need of protection). *Cumhuriyet University Social Sciences Magazine*, 32(2), 283- 305.
- Özdenk Ç. (2007). *6 yaş grubu öğrencilerinin psikomotor gelişimlerinin sağlanmasında oyunun yeri ve önemi (Place and importance of play in psychomotor development of six year-old students)*. (Unpublished Master Thesis), Fırat University Social Sciences Institute, Elazığ.
- Öztürk, H. (1995). *Okul öncesi eğitim kurumlarına giden ve gitmeyen ilkokul birinci sınıf öğrencilerinin alıcı ve ifade edici dil düzeyleri (Receptive and expressive language levels of first grade students who attend preschool versus those that do not)*. (Unpublished Master Thesis), Gazi University, Ankara.
- Pehlivan, D. (2006). *Okul öncesi eğitim alan ve almayan öğrencilerin ilkokuma ve yazmaya geçiş sürecinin öğretmen ve öğrenci görüşleri doğrultusunda değerlendirilmesi (Evaluation of transition to literacy of students who attend preschool versus those that do not based on teacher and student opinions)*. (Unpublished Master Thesis), Çukurova University Social Sciences Institute, Adana.
- Polat Unutkan, Ö. (2003a). *Marmara ilköğretime hazır oluş ölçeğinin geliştirilmesi ve standardizasyonu (Development and standardization of Marmara primary school readiness scale)*. (Unpublished PhD Thesis), Marmara University, Education Sciences Institute, Istanbul.
- Polat Unutkan, Ö. (2003b). *Çocuğunuz okula hazır mı? (Is your child ready for school?) Eğitim İletişim Magazine*, August-September Issue, 31-34.

- Polat Unutkan, Ö. & Oktay, A. (2004). *Marmara İlköğretime Hazır Oluş Ölçeğinin Geliştirilmesi ve Standardizasyonu. (Development and standardization of Marmara school readiness inventory) First International Pre-School Education Congress*. Marmara University. Yapa Publishing. İstanbul, 336-352.
- Polat Unutkan, Ö. (2006a). *Okul öncesinde ilköğretime hazırlık (Primary school readiness at preschool)*. İstanbul: Morpa Kültür Publishing.
- Polat Unutkan, Ö. (2006b). İlköğretim 1. sınıfa başlarken: çocuk-öğretmen ve anne baba (Starting the first grade: child-teacher and parents), *İlköğretime Yeniden Bir Bakış (Primary School Revisited)*. Eds: Prof. Dr. Oktay- Dr. Özgül Polat Unutkan, Morpa Kültür Publishing, İstanbul, 10-11.
- Polat Unutkan, Ö. (2006c). A Study of pre-school children's school readiness related to scientific thinking skills. *Turkish Online Journal of Distance Education TOJDE*, 7(4).
- Polat Unutkan, Ö. (2007). Okul öncesi dönem çocuklarının matematik becerileri açısından ilköğretime hazır bulunuşluğunun incelenmesi (Studying primary school readiness of preschool children in terms of mathematics skills). *Hacettepe University Education Faculty Magazine*, 32, 243-254.
- Santo, A. (2006). *School readiness: perceptions of early childhood educators, parents and preschool children. Unpublished doctoral dissertation*, University of Toronto, Department of Human Development and Applied Psychology, Toronto.
- Seçilmiş, S. (1996). *Anaokuluna giden ve gitmeyen erken çocukluk dönemindeki çocukların dil gelişimi ile ilgili becerilerin incelenmesi (Studying language development skills of children in early childhood who attend preschool versus those that do not)*. (Unpublished Master Thesis), Hacettepe University, Ankara.
- Sloutsky, V. M. (1997). Institutional care and developmental outcomes of 1 and 7-year-old children: a contextualist perspective. *International Journal of Behavioral Development*, 20 (1): 131-151.
- Şimşek, Z., Erol, N., Öztıp, D., & Özcan, Ö. (2008). Kurum bakımındaki çocuk ve ergenlerde davranış ve duygusal sorunların epidemiyolojisi; ulusal örnekleme karşılaştırmalı bir araştırma (Epidemiology of behavior and emotional problems of children and adolescents under institutional care: comparative study with national sample). *Turkish Psychiatry Magazine*, 19(3), 235-246.
- Tamkavas, E. (2003). *5-6 yaş çocuklarının öz bakım becerilerinin cinsiyet ve okul öncesi eğitim alma durumlarına göre incelenmesi (Examining 5 and 6-year old children's self-care skills according to gender and preschool education)*. (Unpublished Master Thesis), Selçuk University Social Sciences Institute, Konya.
- Taner, M. (2003). *Okul öncesi eğitimi alan ve almayan farklı sosyo-ekonomik düzeylerdeki ilköğretim birinci sınıf öğrencilerinin dil gelişimlerinin karşılaştırılması (Comparison of language skills at first grade students from different socio-economic backgrounds who attend preschool and those that do not)*. (Unpublished Master Thesis), Uludağ University, Bursa.
- Taylor, K. K., Gibbs, A. S., & Slate, J. R. (2000). Preschool attendance and kindergarten readiness. *Early Childhood Education Journal*, 27(3), 191-195.
- Telegdy, G. A. (1974). The relationship between socioeconomic status and school readiness, *Psychology in the Schools*, 11(3), 351-356.
- Tuğrul, B. (1992). *Anaokulu eğitimi alan ve almayan çocukların ilköğretim birinci sınıftaki akademik başarı ve ruhsal uyum davranışlarının karşılaştırmalı olarak incelenmesi (Comparative study of first grade students who attended preschool versus those that did not based on academic success and mental adjustment)*. (Unpublished PhD Thesis), Hacettepe University, Social Sciences Institute, Ankara.
- Turaşlı, N. (2006). *6 yaş grubu çocuklarda benlik algısını desteklemeye yönelik sosyal-duygusal hazırlık programının etkisinin incelenmesi (Studying the effect of socio-emotional preparation program directed towards supporting understanding of self in 6 year-old children)*. (Unpublished PhD Thesis), Marmara University, İstanbul.
- Turhan, G. (2004). *Anasınıfına devam eden alt sosyo-ekonomik düzeydeki çocuklara uygulanan matematiksel kavramları destekleyici eğitim programının cümle ve sayı olgunluğuna etkisinin incelenmesi (Studying the impact of education program supporting mathematics on sentence and number maturity of preschool students with low socio-economic background)*. (Unpublished Master Thesis), Gazi University, Ankara.
- Tuzcuoğlu, N. (1989). *Korunmaya muhtaç çocukların öğrenim problemleri (Learning problems of children in need of protection)*. (Unpublished Master Thesis), Gazi University, Social Sciences Institute, Ankara.
- Uğur, H. (1998). *Anasınıfı eğitiminin sosyalleşmedeki rolü ve öğrencileri sosyalleştirme açısından özel ve devlet anasınıflarının karşılaştırılması (Role of preschool education in socialization and comparison of public and private preschools in socialization of students)*. (Unpublished Master Thesis), Sakarya University, Social Sciences Institute, Sakarya.
- Yangın, B. (2007). Okul öncesi eğitim kurumlarındaki altı yaş çocuklarının yazmayı öğrenmeye hazır bulunuşluk durumları (Level of writing readiness of six year-old children in preschools). *Hacettepe University Education Faculty Magazine*, 32, 294-305.
- Yayla, Ş. (2003). *Alt Sosyo-ekonomik Düzeydeki Ailelerden Gelen 60-72 Aylar Arasındaki Çocuklara Uygulanan Dil Eğitim Programının Çocukların Dil Gelişimine Etkisinin İncelenmesi (Studying impact of*

- language development program on linguistic development of 60-72 month-old children from families with low socio-economic status. (Unpublished Master Thesis), Gazi University, Education Sciences Institute, Ankara.*
- Yeşil, D. (2008). *Okul öncesi eğitim almış ve almamış öğrencilerin okula uyumlarının karşılaştırılması (Comparison of school adjustment of students that attended preschool with those that did not).* (Unpublished Master Thesis), Yeditepe University, Social Sciences Institute, Istanbul.
- Yılmaz, E., & Dikici Sığırtmaç, A. (2008). İlköğretim birinci sınıfa devam eden çocukların ilk okuma yazmaya geçiş sürelerinin okul öncesi eğitim alma durumuna göre incelenmesi (Studying duration of transition to literacy of first grade students based on preschool attendance). *Çağdaş Eğitim*, 349, 30-36.