

The Online Journal of Distance Education and e-Learning

Volume 3 Issue 3
July 2015

Editor-in-Chief
Prof. Dr. Aytekin İşman

Editor
Prof. Dr. Cengiz Hakan AYDIN

Associate Editor
Assist. Prof. Dr. İrfan ŞİMŞEK

Technical Editor
Hüseyin ESKİ



Copyright © 2013 - THE ONLINE JOURNAL OF DISTANCE EDUCATION AND E-LEARNING

All rights reserved. No part of TOJDEL'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.

Contact Address:

Prof. Dr. Aytakin İŞMAN
TOJDEL, Editor in Chief
Sakarya-Turkey

Published in TURKEY

Message from the Editor-in-Chief

Hello from TOJDEL

TOJDEL welcomes you.

We are very pleased to publish volume 3 issue 3 in 2015. As an editor-in-chief of The Online Journal of Distance Education and e-Learning (TOJDEL), 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 distance education and e-learning by valuable researchers. I and The Online Journal of Distance Education and e-Learning (TOJDEL) 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 tojdel.editor@gmail.com for the next issues.

TOJDEL will organize IDEC-2015 International Distance Education Conference (www.id-ec.net) between September 02-04, 2015 in Russia. This conference is now a well-known distance education event. It promotes 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 conference book has been published at <http://www.id-ec.net/idecpubs>

Call for Papers

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 The articles should be original, unpublished, and not in consideration for publication elsewhere at the time of submission to TOJDEL.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

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

July 01, 2015

Editor in Chief

Prof. Dr. Aytekin ISMAN

Editor-in-Chief

Prof. Dr. Aytekin İŞMAN - Sakarya University, Turkey

Editor

Prof. Dr. Cengiz Hakan AYDIN - Anadolu University, Turkey

Associate Editor

Assist. Prof. Dr. İrfan ŞİMŞEK - Istanbul University, Turkey

Technical Editor

Hüseyin ESKİ - Sakarya University, Turkey

Editorial Board

- Prof.Dr. Adnan BAKİ - Karadeniz Teknik University, Turkey
Prof.Dr. Adnan BAKİ - Karadeniz Teknik University, Turkey
Prof.Dr. Ahmet Pehlivan - Cyprus International University, TRNC
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 - Firat 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. C. Hakan AYDIN - 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 Tainan, 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. Don M. FLOURNOY - Ohio University, USA
Prof.Dr. Dongsik Kim - Hanyang University, South Korea
Prof.Dr. Galip AKAYDIN - Hacettepe University, Turkey
Prof.Dr. Enver Tahir RIZA - Dokuz Eylül University, Turkey
Prof.Dr. Eralp ALTUN - Ege University, Turkey
Prof.Dr. Feng-chiao Chung - National pingtung university, Taiwan
Prof.Dr. Ferhan ODABAŞI - Anadolu University, Turkey
Prof.Dr. Finland Cheng - National pingtung university, Taiwan
Prof.Dr. Fong Soon Fook - Uniiversiti Sains Malaysia, Assoc.Prof.Dr. Dimiter G. Velev - University of National and World Economy, Bulgaria
Assoc.Prof.Dr. Eric Meng - National pingtung university, Taiwan
Assoc.Prof.Dr. Eric Zhi Feng Liu - National central university, Taiwan
Assoc.Prof.Dr. Erkan TEKİNARSLAN - Bolu Abant İzzet Baysal University, Turkey
Assoc.Prof.Dr. Fahriye ALTINAY - Near East University, TRNC
Assoc.Prof.Dr. Ezendu ARIWA - London Metropolitan University, U.K.
Assoc.Prof.Dr. Fahad N. ALFahad - King Saud University
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 ÇALIŞKAN - 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. Hüseyin YARATAN - Eastern Mediterranean University, TRNC
Assoc.Prof.Dr. Işıl KABAKCI - Anadolu University, Turkey
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.Dr. İsmail İPEK - Bilkent 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 Tainan, 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,

- 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 YALIN - Gazi University, Turkey
 Prof.Dr. Heli RUOKAMO - University of Lapland, Finland
 Prof.Dr. Henry H.H. Chen - National pingtung university,
 Taiwan
 Prof.Dr. Hüseyin Ekiz - Süleyman Şah University, Turkey
 Prof.Dr. Ing. Giovanni ADORNI - University of Genova, Italy
 Prof.Dr. J. Ana Donaldson - AECT 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 KESİM - Anadolu University, Turkey
 Prof.Dr. Mei-Mei Chang - National pingtung university,
 Taiwan
 Prof.Dr. Melissa Hur-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 Şahin DÜNDAR - Sakarya University, Turkey
 Prof.Dr. Mustafa Murat INCEOGLU - Ege 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. Rauf YILDIZ - 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. Salih ÇEPNİ - Karadeniz Teknik University, Turkey
 Prof.Dr. Servet BAYRAM - Marmara 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
- 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. 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. 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 ALTINAY - 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. 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. Fahme Dabaj, Eastern Medeterrian
 University, TRNC
 Assist.Prof.Dr. Ferman Konukman - The College of
 Brockport, State University of New York, USA
 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 DEMİRBİLEK - Süleyman Demirel
 University, Turkey
 Assist.Prof.Dr. Pamela EWELL - Central College of IOWA,

- Prof.Dr. Stefan AUFENANGER - University of Mainz, Germany
- 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 AKPINAR - 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. Zeki KAYA - Gazi University, Turkey
- Assoc.Prof.Dr. Abdullah Kuzu - Anadolu University, Turkey
- Assoc.Prof.Dr. Adile Aşkim KURT - Anadolu University, Turkey
- Assoc.Dr. Aytaç Göğüş - Sabancı University, Turkey
- Assoc.Prof.Dr. Betül ÖZKAN - University of Arizona, USA
- 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 Rutkauskiene - Kauno Technology University, Lietvenia
- Assoc.Prof.Dr. Ming-Chang Jeng - National pingtung university, Taiwan
- Assoc.Prof.Dr. Murat ATAİZİ - Anadolu University, Turkey
- Assoc.Prof.Dr. Norazah Mohd Suki - Universiti Malaysia Sabah, 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. David Tawei Ku - Tamkang University, Taiwan
- 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. Santosh Kumar Behera - Sidho-Kanho-Birsha University, India
- Assist.Prof.Dr. Selma KOÇ Vonderwell - Cleveland State University, Cleveland
- Assist.Prof.Dr. Tsung - Yen Chuang - National University of Taiwan, Taiwan
- Assist.Prof.Dr. Vahid Motamedi - Tarbiat Moallem University, Iran
- Assist.Prof.Dr. Vincent Ru-Chu Shih - National Pingtung University of Science and Technology, Taiwan
- Assist.Prof.Dr. Yalin Kılıç TÜREL - Firat University, Turkey
- Assist.Prof.Dr. Yu - Ju Lan - National Taipei University of Education, Taiwan
- Assist.Prof.Dr. Zerrin AYZAZ REİS - İstanbul University, Turkey
- Assist.Prof.Dr. Zülfü GENÇ - Firat 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. Carmencita L. Castolo - Polytechnic University of the Philippines, Philippines
- 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. 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. 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. Tam Shu Sim - University of Malaya, Malaysia
- Dr. Tiong Goh - Victoria University of Wellington, New Zealand
- Dr. Vikrant Mishra - Shivalik College of Education, India
- Chen Haishan - China Open University, China
- Chun Hung Lin - National central university, Taiwan
- I-Hen Tsai - National University of Tainan, Taiwan
- Sachin Sharma - Faridabad Institute of Technology, Faridabad

Table Of Contents

AGRICULTURAL EDUCATION IN BANGLADESH OPEN UNIVERSITY	1
<i>Md. Farid Hossain</i>	
BRICK AND MORTAR UNIVERSITY ON THE WAY TO VIRTUAL UNIVERSITY	7
<i>Prof. Bednarczyk Malgorzata</i>	
CULTURAL COMPETENCE AND INTERCULTURAL COMMUNICATION IN THE DIDACTICS OF FOREIGN LANGUAGES	11
<i>Magdalena Lewicka</i>	
E-LEARNING READINESS IN MEDICINE: TURKISH FAMILY MEDICINE (FM) PHYSICIANS CASE	21
<i>Alaattin Parlakkılıç</i>	
FREEWARE AND OPEN SOURCE SOFTWARE TOOLS FOR DISTANCE LEARNING IN MATHEMATICS	26
<i>Farha Sattar, Laurence Tamatea, Muhammad Nawaz</i>	
MOTIVATION AND RETENTION: A COMPARISON BETWEEN FULLY ONLINE STUDENTS AND ON-CAMPUS STUDENTS TAKING ONLINE COURSES	33
<i>Ernesto Gonzalez</i>	
STUDENTS LEARNING STYLE AND ATTITUDE WITH INFORMATION VISUALIZATION	49
<i>Dalia Alyahya, Suzan Alyahya</i>	
THE IMPACT OF SYNCHRONOUS AND ASYNCHRONOUS COMMUNICATION TOOLS ON LEARNER SELF-REGULATION, SOCIAL PRESENCE, IMMEDIACY, INTIMACY AND SATISFACTION IN COLLABORATIVE ONLINE LEARNING	55
<i>Mahnaz Moallem</i>	
THREE LEARNING POTENTIALS IN DIGITAL GAMES: PERCEPTION OF MALAYSIAN UNIVERSITY TEACHERS	78
<i>Enas Noraddin</i>	
VIRTUAL COLLABORATION: A PHENOMENOLOGICAL STUDY OF REMOTE ONLINE ADJUNCTS VIRTUAL COLLABORATION LIVED EXPERIENCES	90
<i>Dr. Lori Schieffer</i>	

AGRICULTURAL EDUCATION IN BANGLADESH OPEN UNIVERSITY

Md. Farid Hossain

Professor (Agriculture) School of Agriculture and Rural Development,
Bangladesh Open University Gazipur-1705, Bangladesh
faridhossain04@yahoo.com

Abstract: This paper discusses the status of agricultural education in Bangladesh Open University. The need for transfer of updated agricultural technology is at the top of the agricultural policy of the country. Research institutes usually generate technology; it is transferred through different extension approaches and mass media to the learners and farmers. The Bangladesh Open University (BOU) is to expand all levels of education in different fields. The School of Agriculture and Rural Development (SARD) of BOU is to impart education through distance mode comprising formal and non-formal programs in the field of agriculture and rural development. The learning procedure also includes tutorial supported audio and video programs. The School of Agriculture and Rural Development is offering four formal programmes namely, Bachelor of Agricultural Education (B.Ag.Ed), Diploma in Youth in Development Work (DYDW), Certificate in Livestock and Poultry (CLP) and Certificate in Pisciculture and Fish Processing (CPFP). Learners' participation in the tutorial classes at tutorial centres (TCs) of SARD programmes is not satisfactory and missing practical sessions seriously hampers the learners. To improve the overall situation for ensuring quality of the SARD programmes that includes imposition of compulsion on the students to attend the practical sessions, emphasize on research facilities of faculty members, updating the study materials, timely distribution of learning materials, broadcast of media programmes and result publication.

Keywords: Open University, Agriculture, Distance education, Bangladesh

INTRODUCTION

The opportunity for higher education in agriculture is extremely limited in Bangladesh, and therefore, even students, who can afford to finance their studies, it is very difficult to get admission into the universities due to limited capacity [1]. Prime objective of Bangladesh Open University (BOU) is to transform the country's vast human resources into an educated and trained work force by formal and non-formal through distance education [2]. The Bangladesh Open University is to expand all levels of education in different fields. The School of Agriculture and Rural Development (SARD) of BOU is to impart education through distance mode comprising formal and non-formal programs in the field of agriculture and rural development. Field trails or demonstration is a very effective way for dissemination of technology in presence of scientists, extension workers and farmers. Field demonstrations on improved practices through media programs are most effective to affect adoption behavior of farmers. Traditional commodity oriented agricultural research does not necessarily consider these realities. As a result, many of the technologies developed by different research institute have not been adopted by the farmers or else they have not been successful in promoting equitable socioeconomic development. Transferring new findings and technologies to rural farmers remain a promising strategy for increasing agricultural productivity. The new idea must reach farmers' farms and homes through effective extension the technologies and put them into use [3]. Using the mass media has caused an increase in the knowledge level and the output of educational system in recent decades. It seems the main reason for the popularity of television lies in its simplicity for the audiences. Since people intend to choose the easiest way for learning the simplest way can be found in television educational programs [4]. ICTs in delivering course materials of BOU and other academic institutes to promote distance education in Bangladesh [5]. The paper is an overview of agricultural education programmes in Bangladesh Open University.

MEDIA PROGRAMME AND AGRICULTURE

There is no doubt that information and communication technologies (ICT) have influenced educational circumstances more than any other categories [6]. Many researchers and educators have tested the understanding of farmers and other clients toward the delivery of educational information [7- 13]. The outcomes of their studies indicate that extension educators to communicate new and emerging technologies to farmers use different media and methods. The information sources in different topics of agriculture for the farmers are radio and television, the propagation publication, daily farm newspapers, agriculture exhibitions, practical education, and consultation services, respectively [3]. North California, newsletters are the most important information source in the agricultural sector. Among the media, utilizing scientific conferences, computer and other new media are the least preferred; so, few of the farmers use them [14]. Video, radio and television are the major sources of information for the farmers in Nigeria, and print media have a specific situation in transferring agricultural information as well. Among the mass media, regarding informal education, radio and television have a specific situation. Due to the vast use, the media are among the best educational and cultural instruments [15]. The

success of agricultural development programmes in developing countries largely depends on the nature and extent of use of mass media in mobilization of people for development. The planners in developing countries realize that the development of agriculture could be hastened with the effective use of mass media [16]. Radio and television has been acclaimed to be the most effective media for diffusing the scientific knowledge to the masses.

SCHOOL OF AGRICULTURE AND RURAL DEVELOPMENT OF BOU

School of Agriculture and Rural Development of the BOU is actively engaged in educating people of the rural areas of the country with the help of modern technology of agriculture to boost up production of different agricultural commodities including field crops, poultry, dairy and fish. Agriculture contributes more than 50% of the output of the economy and employs approximately two thirds of the labor force of the country [17]. The primary emphasis of development efforts in agriculture since independence has been to replace the age old methods of agriculture with modern technology capable of sustainable growth. Farmers in the country, mostly uneducated, are still following the traditional practices of agriculture. Government and non-government organizations (NGOs) in the country are working tirelessly to educate the farmers with modern techniques of production. Agricultural Universities along with other universities of the country has been producing agriculture graduates who join the Department of Agriculture Extension to work as extension officers in order to transfer the updated technology to farmers. There are several research institutions in the country to do search in finding out solutions of local problems of farm production. But to reach the huge mass associated with so diversified fields of agriculture is not an easy task [18].

TUTORIAL SERVICE OF BOU

The BOU follows curriculum based courses which are offered through different tutorial centre's located in different geographical districts. Actually tutorial centres are the well-reputed institutions located outside of Bangladesh Open University main campus. There is a memorandum of understanding between Bangladesh Open University and the said institutions for tutorial services. Remuneration is paid to the tutorial centre for tutorial services. The tutor's qualification, training especially training in distance learning and experience play an important role in the learning process [19]. Modules are handed over to the learners and tutorial support is provided for each subject by experienced tutors (facilitators) from the localities where the TCs are situated. Theoretical classes are held in the traditional class rooms. Practical classes are held in the field laboratories of the TCs. Strict regulations are followed during enrolment, tutoring and evaluation for quality assurance of the learners. Print and electronic media are used to support students. Books are printed in modular formats. It has been observed that proper guidance, especially through practice teaching is difficult to provide to the learners, though theoretical aspects are easily dispersible. Various methods are in trial to identify the better methods of practical demonstration with interactive approach [18].

MODE OF DELIVERY

The BOU has a rich media centre where video and audio teaching aids are produced for broadcasting through national TV and radio channels. As such student support in print forms as well as through TV and radio are provided to the learners. In conventional system of education, learning is greatly influenced by the dynamic interaction process that goes on between a teacher and his/ her students. The learning procedure also includes tutorial supported audio and video programmes [20]. In distance education system such face to face interaction is almost absent. Besides the use of electronic media for delivering lectures, Bangladesh Open University supports with face to face interaction between learners and tutors at the tutorial centres located outside of the main campus. Several factors like conditions and infrastructure of the tutorial centres, tutor's qualification, experience and training in distance learning, teaching style and strategies are of importance in the process of acquiring education through distance mode [19]. Importance of ODL has recently been focused as a useful tool for transfer of agricultural technology from the researchers and academics to the farmers who are the end users. Mass education through formal and non-formal programmes in ODL is well recognized today throughout the world. But it is difficult to teach science subjects specially the practical oriented courses of agriculture, in distance mode.

SARD ENSURES THE PRACTICAL COURSES

Conventional universities have the advantage to offer laboratory or field facilities for practical demonstration. But it is always difficult to demonstrate distance learners any sort of actual operations to practice and learn. Only reading of printed material is not sufficient for attainment of knowledge of practical oriented subjects because the quality of a programme depends on the process and outcome. The School of Agriculture and Rural

Development of the BOU has taken up an ambitious project to offer several programmes and courses of agriculture mainly for transferring the updated technologies to the rural people [18]. SARD ensures the practical courses for learners through using the laboratory and field facilities of recognized tutorial institutes.

EXAMINATION PROCEDURE OF FORMAL SARD PROGRAMMES

Examinations both theoretical and practical are held after end of each semester. Objective and broad type questions are set and scripts are examined by external examiners. Practical demonstration and oral are the part of practical examination. Result of every examination is centrally published by the Controller of Examinations at the BOU after each semester. The entire system of examination is quite smooth except that it takes about 2 months to complete the examinations and another few months for evaluation and publishing the results. Unusual time is also taken to distribution of scripts to the examiners and again received the scripts from the examiners by registered mail. Then getting them back for tabulation and finally for the publication of results.

FORMAL PROGRAMMES OF SARD

At present the School of Agriculture and Rural Development is offering four formal programmes namely the Bachelor of Agricultural Education (B.Ag.Ed), the Diploma in Youth in Development Work (DYDW), Certificate in Livestock and Poultry (CLP) and Certificate in Pisciculture and Fish Processing (CPFP).

B.Ag.Ed

This is a graduate programme designed to provide proper education in agriculture to the teachers of schools and madrasahs (religious school) who are engaged in teaching agriculture to the secondary level students. Agronomy, horticulture, nursery management, fishery, poultry, dairy etc. along with language proficiency and some pedagogical courses are the core courses of the programme. Diploma in Agriculture or higher secondary level of education is the required qualification for enrolment in the programme. In the country, agriculture is taught as an important subject along with other compulsory subjects. But there is a dearth of qualified teachers in agriculture. It was rather impossible for any other university to take the task to train such a huge number teachers of agriculture without following the proven method of ODL. The BOU was given the responsibility by the government to offer the B.Ag.Ed. programme in the year 1996 and the first batch of students graduated in the year 1999 [21]. It is a six semester programme with six months for each semester. The programme is offered through 15 Tutorial centres (TCs) covering the entire geographical area of the country.

DYDW

This is a graduate diploma programme. Modules written in English have been provided by the Commonwealth Youth Programme (CYP). A strong force of youth workers is expected to get proper training in youth development to enrich human resource development after exposure to the courses of this programme. Graduation in any discipline is the required qualification for enrolment in the programme. It is a three semester programme with six months for each semester. The programme is offered through 3 Tutorial centres (TCs) in the country. Learners' evaluation is done by end semester theoretical examinations, assignments and orals.

Certificate in Livestock and Poultry (CLP)

This is a certificate programme having duration of six months. Certified learners are expected to learn the basic techniques of rearing livestock and poultry so that they can start their own farms of dairy or poultry to become self employed. Both theory and practicals are provided through printed modules, TV and radio broadcasts. School secondary Certificate (SSC) level of education is the required qualification for enrolment in the programme.

Certificate in Pisciculture and Fish processing (CPFP)

This is a certificate programme having duration of six months. School secondary Certificate (SSC) level of education is the required qualification for enrolment in the programme. Bangladesh is a land of rivers, ponds and lakes. Fish is a common item in the everyday dietary menu of almost everybody and it is thus the main source of protein. There was a day not long ago when fishes in abundance could be obtained from natural water pools, rivers and ponds. But those days have gone by now with the growth of population. Only recently government has taken steps to boost up fish production in the country by systematic rearing of fishes with modern methods and machinery. CPFP programme has been designed to impart knowledge of modern fish production techniques [21].

Non-formal Programmes

The BOU also offers non-formal programmes to transfer the technology of agriculture to rural farmers. These programmes are dispersed through national TV and radio station. The programmes are produced by the media

centre of the BOU and the scripts are written by the faculty members and imminent guest scientists of the country.

CONSTRAINTS

Dropout of students is one of the main problems. About 30% dropout is noticed in the B.Ag.Ed programme, where as 60%, 20% and 15% dropouts have been noticed in the DYDW, CLP and CFPF programmes, respectively [21].

Distance of the TCs from the residences of learners, uneasy feeling of an unfriendly atmosphere in the tutorial sessions and above all, the far way attachment with the faculty at the BOU bring a feel of loneliness to the learners. These have been identified as the prime causes of irregular attendance in the tutorial sessions [21].

Attendance in tutorial sessions cannot be made compulsory to the learners in the ODL system. But missing practical sessions seriously hampers the learners. It has also been observed that the students who did not attend the tutorial sessions regularly failed in great numbers in the practical part of examinations. Question has also been raised about the effectiveness of the practical sessions [21].

Timely distribution of learning materials and result publication are the main constraint of Bangladesh Open University. Unexpected delay of receiving course materials and results sometimes brings frustrating feeling to the learners.

Lack of research and evaluation makes BOU programmes very much static and backward as times goes ahead. No improvement is made with the courses [22].

Failure of on-time production and delivery of media programme is a problem at Bangladesh Open University. It will seriously hamper the long-term sustainability of BOU programmes [22].

FUTURE STRATEGY FOR IMPROVEMENT OF SARD PROGRAMMES

The School of Agriculture and Rural Development has put forward some suggestions to improve the overall situation that includes imposition of compulsion on the students to attend the practical sessions. This can be done by allotting 10% of total marks for attendance. More effective tutor training has been suggested to motivate the tutors to behave as a tutor not as a teacher for creation of friendlier environment in the tutorial sessions and to make the sessions learner-oriented by more interaction and collaboration [21]. Innovative approaches, such as revision of curricula, supply of audio-visual materials to the tutorial centers, increase facilities for practical sessions, introduce asynchronous electronic technologies (internet, e-mail and mobile phone) for rapid dissemination of information on admission; tutorial session and examination are suggested [23]. BOU authority must take initiatives to enhance professional skilled of the teachers of SARD and should emphasize on research and regular revision or updating the study materials for ensuring quality of the running programmes.

CONCLUSION

The Bangladesh Open University (BOU) is to expand all levels of education in different fields through media and Information communication Technology (ICT). The need for transfer of updated agricultural technology is at the top of the agricultural policy of the country. The School of Agriculture and Rural Development (SARD) of BOU is to impart certificate, diploma, graduate level education through distance mode comprising formal and non-formal programs in the field of agriculture and rural development to boost up production of different agricultural commodities including crops, livestock and fisheries. Student attendance in the TCs is not satisfactory and missing practical sessions seriously hampers the learners. To improve the overall situation that includes imposition of compulsion on the students to attend the practical sessions, emphasize on research and updating the study materials for ensuring quality of the programmes. Timely distribution of learning materials in the learners and result publication in due time are the present challenges of Bangladesh Open University.

ACKNOWLEDGEMENT

The author thanks to Dr. N. M. Talukder, former Professor, Bangladesh Agricultural University, Mymensingh and Member of Academic Council, BOU for his valuable suggestions and cordial cooperation. Author extended his thanks to Dr. A. M. Faruque and Dr. M.T. Islam, former Professor of SARD, BOU for their earlier worked and article in relation to agriculture education in distance mode.

REFERENCES

[1]. Sadeq, A. M. (2003). Cooperation and collaboration for ODE: The case of Bangladesh. Paper presented in 17th AAOU Annual Conference, Held on Thailand, 12-14 November 2003.

[2]. Ali, M. S.; Haque A. K. E. and Rumble, G. (1997). The Bangladesh Open University: Mission and promise, Open Learning: The Journal of Open and Distance Learning. 12(2):12-28.

- [3]. Ekoja, I. (2003). Farmer's access to agricultural information in Nigeria. *Bull. Am. Info. Sci. Technol.* 29 (6):21-23.
- [4]. Buren, E.D. (2000). *Cultural Aspects of Communication for Development*. Translator. Falsafi, S. Tehran. IRIB Press. Iran, pp.110-114.
- [5]. Islam, M. T. and Selim, A. S. M. (2006). Current status and prospects for e-learning in the promotion of distance education in Bangladesh. *Turkish Online Journal of Distance Education* 7(1), article no. 11.
- [6]. Asnafi, A. and Hamid, A. (2008). The role of ICT in developing of knowledge centre of Iran information and scientific evidence. *E- Journal*: 3(2). Available at: <http://aeizhazmi.persianblog.ir/post/13>.
- [7]. Gamon, J.A.; Bounaga, L. and Miller W.W. (1992). Identifying information sources and educational methods for soil conservation information used by landowners of highly erodible field. *J. Appl. Commun.*, 76 (1):1-5.
- [8]. Caldwell, A.E. and Richardson, J.G. (1995). Performance of a traditional extension audience for self-directed delivery methods. *J. Appl. Commun.* 79(1):31-40.
- [9]. Laughlin, K.M. and Schmidt, J.L. (1995). Maximizing program delivery in Extension [Online]: 33(4). Available at : <http://joe.org/joe/1995august/a4.html>.
- [10]. Trede, L.D. and Whitaker, S. 1998. Perceptions of Iowa beginning farmers towards delivery of education. *J. Appl. Commun.* 82(4):22-33.
- [11]. Suvedi, M.; Campo S. and Lipinski, M.K. (1999). Trends in Michigan farmers' information seeking behaviors and perspectives on the delivery of information. *J. Appl. Commun.* 83(3):33-50.
- [12]. Akar-Vural, R. (2010). How rural schoolchildren and teachers read TV dramas: A Case Study on Critical Media Literacy in Turkey. *Urban Educ.* 45(5): 740-763.
- [13]. Faiola, A.; Davis, S.B.; Edwards R.L. (2010). Extending knowledge domains for new media education: integrating interaction design theory and for new media education: integrating interaction design theory and methods. *New Media Soc.* 12(5):691-709.
- [14]. Jenkins C.N.H.; McPhee, S.J.; Bird, J.A.; Pham, G.Q.; Nguyen B.H.; Nguyen, T.; Lal K.Q.; Wong, C. and Davis, T.B. (1999). Effect of a media-led education campaign on breast and cervical cancer screening among Vietnamese-American women. *Preventive Med.* 28(4); 395-406.
- [15]. Arokoyo, T. (2003). ICT's for agriculture extension? CTA's observatory on ICT's. 6th Consultative Expert Meeting. Wageningen, 23-25 September.
- [16]. Salleh, H.; Hayrol Azril, M.S.; Abu Samah, B.; Shahkat Ali, M.S. and Ramli, N.S. (2010). Agriculture Communication in Malaysia: The Current Situation. *Amer. J. Agric. Biol. Sci.* 5(3):389-395.
- [17]. Islam, A. (1997). Agriculture for 21st Century in Bangladesh. *Proc. of JICA Alum Assoc of Bangladesh*.
- [18]. Faruque, A.M. (1998). How Effectively We can Teach Agriculture in Distant Mode. *Proc. of the International Conference on Collaborative and Networked Learning*. New Delhi. 1998.
- [19]. Rahman, K.M.R. and Sadat, A. (2010). Analysis of Tutorial Services for Distance Learners: A Case of Bangladesh Open University. School of Science and Technology, Bangladesh Open University (http://wikieducator.org/images/3/37/PID_265.pdf)

- [20]. Kirkwood, A. (1998). New media mania: Can information and communication technologies enhance the quality of open and distance learning? *Distance Education* 19(2):228-241.
- [21]. Faruque, A.M. (2004). Agricultural Education in Distant Mode in Bangladesh Open University-A New Approach to Transfer of Technology (<http://www.col.org/pcf2/papers%5Cfaruque.pdf>).
- [22]. Sultana, S.A. and Kamal, M.A. (2002). Distance Education and Open Learning in a Developing Country like Bangladesh: Philosophy and Reality. *2nd Pan-Commonwealth Conference Proceedings* (<http://www.col.org/pcf2/papers/sultana.pdf>)
- [23]. Islam, M.T. (2008). Appropriateness of Curricula, Technology Choice and Methods of Assessment: A Study of Vocational Education Programmes in Agriculture through Distance Mode. Presented in the 5th Meeting of the Pan Commonwealth Forum, 13–27 July, 2008, University of London, UK. (<http://wikieducator.org/images/9/9c/Dr.Tofazzal-PCF5.pdf>)

Brick and Mortar University on the Way to Virtual University

Prof. Bednarczyk Malgorzata, Ph.D
Jagiellonian University, Poland
Bednarczyk Agata
English Modern School

Abstract: Nowadays existence of every university is based on internet. In educational settings it is used for storing results and students' data, communication inside an organization, between an organization and students, teachers and students, between peers. Even brick and mortar universities are indeed semi-virtual organizations. It is no longer a question of using internet or not, it is a question of what it is used for. It is a profound dilemma especially for universities that have a reputation and long tradition of higher education. Internet lowers the costs of educational practices but how to preserve high outcomes of learning? What are the barriers that are needed to be overcome? How does it effect the academic level of students, faculty members and the institution by itself? Could all of the fields of study be offered as an online course? Presented is a sample of Art Education.

Key words: virtual university, blended learning, entrepreneurship in learning communities

Introduction

The Internet has transformed learning into a different level and has changed the character of a typical student, faculty and factors of universities. Gradually brick and mortar institutions offering higher education have implemented online collection of students' results. In 2000 to 2003 it was still rather a rare practice. Next step was offering online courses that soon has become very popular. "The number of students taking at least one online course has expanded at a rate in excess of the growth of overall higher education enrollments" (Storey and Tebes 2008, p. 3) Paule Chau (2004) wrote in „*Online higher education commodity*” that “E-learning has developed and impacted all different fields of studying: business, criminal justice, health administration, psychology, accounting, information technology, pedagogy, art and design etc.” Ongoing digitization of education is unquestionable in all levels: associates, bachelors, masters, doctorate degrees. All types of institutions of higher educations: profit and non profit, public and private, traditional brick and mortar are dependent on the internet. Universities have evolved from using internet to store data to offering online courses finally into Virtual Organization as itself. Internet lowers the costs of educational practices but how to preserve high outcomes of learning? It is the main question for brick and mortar universities today. But there are others: What are the barriers that are needed to be overcome? How does it affect the academic level of students, faculty members and the institution by itself? Could all of the fields of study be offered as an online course? It could be presented on example of Art Education. Answers to these questions will allow the command of the main thesis of the article contained in the question: Is a Virtual University able to educate students on the same level as a brick and mortar University?

Blended learning

How do online courses affect universities? To examine the financial effect we will look closely at the University of Phoenix that is the biggest private university in America with a peak enrollment of almost 600,000 students in 2010. Although the numbers have drastically changed since then, mainly due to change in the economical environment, it is still an interesting case to analyze. University of Phoenix has targeted working adults as big potential market. Carnevale and Olsen (2003) claim that there are an “estimated 70 million working adults [who] have never earned a college degree” (as cited in DeFleur and Adams 2004, p. 151 in „*Online higher education commodity*”, Paule Chau 2004)

With such a big number of people that are not able to attend regular university lectures, the University of Phoenix developed online courses. Which are much more accessible and cheaper for university. It is worth to look at numbers. In the year 2006 net earning of Phoenix University was 2 millions \$ and in the following 3 years has increased almost one million up to 2.9 millions \$, what has noticed by Paule Chau. This financial success in figures was mainly caused by offering online courses for adult students. The present financial crisis that the University struggles with has not changed that it is still the biggest private for-profit Institution that offers higher diplomas. After closing 115 brick-and-mortar locations they have still a nationwide network of 112 locations in 36 states, the District of Columbia, Puerto Rico and total enrollment of 328 0000 students. According to *New York Times* (2012,p.A22): “Enrollments at the University of Phoenix and in the for-profit sector over all have been declining in the last two years, partly because of growing competition from other online providers, including nonprofit and public universities, steady drum roll of negative publicity about the sector’s recruiting abuses, low graduation rates and high default rates.” To conclude three – quarters of their students were studying online and they were offered to move to nearby sites to continue their education in different

institutions. This study shows that e-learning is still growing but wrong procedures of recruitment might be a threat for a bad publicity what effects monetary success of the institution.

What are the admission requirements to enter the University of Phoenix ? The University has targeted students that are working adults. Most of them finished their high school years earlier. All of their scores gained in the past might not be representing their ability to perform now and succeed as university students. More adequate is their current working experience as a criteria to enter the University. What has made the boom in number of enrollments of the University of Phoenix. On the other hand it was a threat for the level of academic achievements of graduate students. This easy admission made the room for abuse and further failure in substantive education of University of Phoenix. How ever it is not a risk for the growth of online courses. They are still a very attractive alternative to the traditional face to face learning but it is a threat for their academic level of achievements. Now every institution that offers higher education needs to incorporate online learning.

“Based on a report by the Sloan Consortium, a consortium made up of institutions and organizations with the mission of integrating online education with mainstream higher education, in 2007 there were approximately 3.94 million online students, which marks a 12.9% increase from 2006 (Allen and Seaman 2008, p. 5)

Entrepreneurship in learning communities

Nowadays existence of every institution is based on the internet. In educational settings it is used for storing results and other students' data, communication inside an organization, between an organization - students, teachers - students, between peers. Even brick and mortar universities are indeed semi- virtual organizations. It is no longer a question of using the internet or not, it is a question of what it is used for. It is a profound dilemma especially for universities that have reputation and long tradition of higher education. Among an abundance that give on -line courses it is a threat that substantive level might drop as shown on example of mentioned before the University of Phoenix.

To give frame for this discussion we will focus on particular elements of functions of organizations that provide higher education. We will skip issues of protection and safety of storing data and the communication within educational settings. Internet lowers the costs of educational practices but how to preserve high outcomes of learning?

S.Hrastinski and J.Jaldemark after analyzing researches that had been conducted before (e.g., Fredericksen et al. 2000; Hiltz et al. 2000; Rovai 2007; Woo and Reeves 2007). are emphasizing that computer based communication between peers and teachers in educational realm has a positive effect. Face to face interaction is no more necessary to stimulate an intellectual growth of students. The easiness of access to information has changed the role of teachers from a person that stores knowledge in their head and has a monopoly on specialist's books to a guide that shows students reliable resources. Although the computer based communication has desired impact on studious growth of students it “is automatically and in most cases unintentionally built into mental functioning” (S.Hrastinski, J.Jaldemark , 2011)

How does it affect students psychology and their performance. What are the factors that decide whether the studies will be completed? Do students gain an overall understanding of their realm of study or do they gather unrelated to each other pieces of information. We will investigate this issue further on.

To examine challenges that occur in front of universities offering online courses We need to compare profile of an traditional and an online student. Face to face education offered a physical venue where learning was taking place. Students were gathered together were they could exchanged their ideas get an advice and mental support. Studying was a major task in their life and they could dedicate to it almost completely. They had common goal what made them feel as part of a community. All of these elements create environment for learning in brick and mortar universities. Thus people taking online courses are usually mature in their age. Apart from working often they have families to take care of. Their time is much more limited and they are isolated from other peers. “In fact, it has been argued that individual success or failure can depend on whether students feel like insiders rather than outsiders” (S.Hrastinski, J.Jaldemark, 2011) Therefore success of online seminars offered by semi or fully virtual universities lays significantly in creating and sustaining communities, where students could be able to get an advice, ask content related questions and receive emotional support. The feel of companionship would support their motivation to complete the studies. Crucial role of success of virtual or semi virtual universities is to create learning communities. Collaborative projects done through electronic media promote social communications that support learning outcome. Stefan Hrastinski and Jimmy Jaldemark (2011) have analyzed how online students interact on project group forums in relation to three aspects: social support, information

exchange, task management. It varies according to the internet tool being used and size of the team working together. To make it most effective and meaningful here are some suggestions to follow :

„Encourage information exchange by establishing requirements and by giving students reasons to participate”.

Asking questions to prove their critical thinking skills.

„Encourage shared task management among students.” To avoid particular students to dominant the whole flow of discussion.

„Encourage social support by organizing social events and by enabling private means of communication. Some students need more private means” to feel related to a group therefore more engaged in the project. Effectiveness of communication is also related to the comfort of knowing partners of discussion.

Further examining aspects of collaborative work : already Ling and Ku in 2006 found “that whether group members had similar or different backgrounds did not seem to have an impact on the degree of learning in an on - line course.” *Chou, Pao-Nan (2012)*

Group projects support individual learning advanced concepts, moreover being exposed to comments of people from different backgrounds deepen the understanding of subject and possibilities of implementation the knowledge. Presence of a mentor on such online group assignment may intimidate some participants but it is a guarantee that substantive outcome will be placed. *Chou, Pao-Nan (2012)* wrote:“Spatariu et al. (2007) reported that a discussion leader's intervention would improve the quality of argumentation in online discussions.”

Online tools of communications are mostly text related in order to create a complex learning there is a great need of planned live human interactions through internet during the course of study. Otherwise there is a threat that text might be misunderstood and wrongly interpreted. Another obstacle for online studying is the need of a social community of peers than for sure enhances learning. *Chou and Pao -Nan (2012)* have analyzed use of 5 different online tools that give variety of different stimulus in order to create motivated and effective learning environment.

They've examined cost effective (for free) online tools for seminars:

Blogging that encourages students to reflect on the subject, it could also storage description and requirements of course.

Skype conferences that help to avoid misunderstanding of text. Planned verbal life interactions might stimulate participants and minimize gaps in knowledge about the subject.

Podcasting the course instructor would need to prepare audio or video supporting aids to implement streaming of information.

Facebook in order to facilitate social support and create a learning community.

Wiki platform for the project so the course's mentor may observe and stimulate discussions.

All of the above online tools need to be launched by a university and operated by the course's instructors. It requires time to change teaching aids into online materials. So knowledge previously storage in instructor's head needs to be transformed into a online text or audio or video materials. Lack of face to face sessions creates a need of involvement in internet social medias in order to build a sense of community which increases workload for the course's instructor. It involves different process of learning. *Rohan Jowallah (2012)* wrote: view this change as the “demonopolisation of teaching” which is the shifting from the ‘teacher focus approach’ to the ‘student centered learning approach’. Therefore, it will be imperative for universities to consider how they will use new technologies to enhance online pedagogy to improve support for research students.”

Creating an online course of study requires entrepreneurship and innovations. It is far different from just giving a lecture. The instructor needs to organize from the scratch the whole process of participant's learning. Though there were made different researches on online group projects, dynamic of every group is different and unexpected issues will appear also related to specific for the realm of subject. The course's instructor needs to be not only a lecturer as in the traditional brick and mortar universities but mentor and coordinator. Technology based group projects facilitate a bigger flow of content related exchange of information. It means that the instructor needs to be highly qualified in the field as well as proactive. While the duration of the project instructor's role is to supervise work being done and check if it leads in the right direction. It might need redesigning the the whole project and task management. The coordinator needs to have manager's skills of dealing with people and the whole group. “ These proficiencies will require online tutors to be creative teachers who are supportive of the learner, skilled in monitoring the learning environment, able to motivate and stimulate the learner, and able to create critical learning interaction between themselves and their students” (*R.Jowallah*

2012) Along with the strong learning community there needs to be provided diversity in ways of delivering knowledge by greatly flexible and critically thinking instructors.

And further “ highlights this importance by stating that the humanized classroom leads to improved learning experiences, student accomplishment, and student retention. “ (R. Jowallah 2012)

Online courses on example of Art Education

Art education is the field that needs practice of craftsmanship in variety of techniques. To master these techniques there needs to be time to explore media. It can not be studied just by reading someones experience it requires to be done physically. It is hard to be an expert in ceramics when you have never touched the clay and used the kiln. However it doesn't mean that ceramics can not be offered as an online course. It would required a visit in ceramic art studios to experiment with the real medium. Students from all over the world before entering the course of study would need to researched if they would have access to an equipped art studios like: metal engraving, jewelry making, ceramic studio, photo studio, video studio, tailor studios, etc.. Technicians would be involved in the process of learning. Final result would be sent by post or just shown through video or sent by internet. Reflections done on internet, could be a proof of authentic and authorship of the projects. Part of the whole assignment could be gathering information of specifics of the medium as itself. It would require a variety general frames of the learning procedure but would give freedom of choosing field of study. So the learning would rely much more on participant's than the university. The University and instructor's role would on designing procedures and requirements to be fulfill, as well of method of assessing the project. Many universities that provide art education organize outdoor trips for painting. It could be an opportunity to build life community. All the knowledge based courses like Art History might be enriched by the access to locally find artifacts. Students from Greece might be encourage to study and prepare video about art of ancient Greece. That would be shared with students from different parts of the world. It would make the study very meaningful and involving in their own cultural heritage. Methodology of teaching might be taught by showing video examples of successfully conducted lessons. Online courses of specific subjects that requires physical activities can be possibly successfully conducted. However the experience and knowledge gathered though the studies is far more specific so it is more recommended for higher then bachelor diploma. To be an expert of the field university students need to first gain general knowledge.

Conclusion

A Virtual University is an institution that offers higher diplomas however the profile of their students is far different. Success of virtual universities lays significantly in creating and sustaining supportive learning environment. It requires creating a community where students can get emotional support, and opportunity for peer learning. The feel of companionship that will motivate them to complete the studies. Presence of a supervisor for the online projects is a guarantee that substantive outcome will be placed. What means that course's instructor will need to be much more involved in students' process of learning. His role will change from a lecturer to manager . However face to face interaction is no more necessary to stimulate an intellectual growth of students. Online tools of communications are mostly text related in order to create a complex learning there is a great need of planned life human interactions through internet during the course of study. Otherwise there is a threat that text might be misunderstood and wrongly interpreted. Along with the strong learning community diversity in ways of delivering knowledge and many content base interaction and greatly flexible critically thinking instructors the outcome of studies is highly possible to be highly successful.

References

- Bednarczyk M. (2001), Public Organisations, PWN SA, Poland
University of Phoenix To Shutter 115 Locations (October 18, 2012) , *New York Times*
Paule Chau (24 October 2010), *Online higher education commodity*, Springer Science+Business Media, LLC 2010
Hrastinski S., Jaldemark J. (8 April 2011), *How and why do students of higher education participate in online seminars?* Springer Science+Business Media
Chou, Pao-Nan (2012), *Teaching Strategies in Online Discussion Board: A Framework in Higher Education*, Higher Education Studies
Rohan Jowallah (2012), *An Investigation into the Management of Online Teaching and Learning Spaces: A Case Study Involving Graduate Research Students*, Higher Education Studies

Cultural Competence And Intercultural Communication In The Didactics Of Foreign Languages

Magdalena Lewicka

Nicolas Copernicus University in Torun, Arabic Language and Culture Center, Poland
magdalewicka@umk.pl

Abstract

For many years European glottodidactics has been postulating for joining the practice of foreign language teaching with the presentation of the realities and culture which resulted in birth of a new glottodidactic sub-discipline called intercultural glottopedagogics, also known by the following terms: *die Landeskunde* (German), *area studies* (English), *la civilisation* (French), *la civiltà* (Italian) or *stranovedenie* (Russian). There is a growing conviction that foreign language teaching should be deeply embedded in the cultural context, including introduction of the culture of a given language area and information about intercultural differences, since despite the fact that in currently dominating communicative approach the key didactic objective is the ability of efficient communication, the indisputable fact is the threat of the efficiency of the communication in the given language posed by the lack of so called intercultural competence. It is defined as the ability to communicate with the members of different cultural circles and nations and the ability to build the „bridges of agreement”, in other words – complex ability to manage oneself in the complicated reality of multilingual and multi-cultural contemporary world. The objective of my paper is the reflection upon cultural problems on the ground of foreign languages, current issues of intercultural approach in the didactics of foreign languages, place and role of intercultural competence among the goals of language teaching, as well as mutual relationship between cultural and communicative competence, theoretical premises and concepts underlying the basis of practical solutions of intercultural teaching and emphasising the function of glottodidactics consisting in approaching the culture of the target language country and explaining intercultural differences, hence the outline of the problems of intercultural tendencies on the ground of contemporary glottodidactics.

Keywords: glottodidactics, teaching foreign languages, intercultural competence, intercultural communication.

Introduction

The starting point of the discussion on glottodidactic aspects¹ of multiculturalism² should be the analysis of the development of methodical views, in which one has to notice a few turning-points concerning the goals of language teaching and their significant influence on perception of the essence of contemporary teaching and learning of a foreign language.

The first of them was establishing that the sub-systems of language are not the primary objective of the foreign language didactics, but language skills. The other was taking notice of the functionality of a language, hence pointing out that through a statement we realise particular language activities, which within the framework of a discussion can occur in various configurations, usually in some subordinate dependencies in relation to dominating language activity, so adopting the communication competence³ as the leading term. The third one was emphasising the link between language and culture, and including in the communication process the variation of terms, norms and behaviours deriving from the cultural distinctness of the participants of this process allowing to find oneself in the communication situation with a representative of a different culture (Myczko, 2005: 25).

Without any doubt, perceiving interculturalism in foreign language teaching⁴ has a specific dimension which results from close relationship between language and culture⁵, because it constitutes the system serving the

¹ About glottodidactic see: Dakowska, 1994; Dakowska, 2002; Grucza, 1974; Grucza, 1976; Grucza, 1978; Grucza, 1979; Grucza, 1985.

² Problems of multiculturalism are discussed in a number of Polish publications such as: Bartz, 1997; Bednarek, 1999; Kempny, Kapciak, Łodziński, 1997; Mamzer, 2002; Torenc, 2007.

³ Concept of communication competence in glottodidactics is discussed in detail in: Stawna, 1991.

⁴ Characteristics of the state of the research, bases and organisation of the intercultural education in glottodidactics are presented by M. Torenc, 2007.

⁵ Issues of the relationship between language and culture and bases of intercultural communication can be

orientation and identification within a given society, which influences perception, thinking, valuation and activities of the representatives of this society. This is why the lack of possibility of acquiring the language without taking into consideration socio-cultural context is emphasised – after all „language communication is often embedded in the situations which are defined by culture” (Myczko, 2005: 28). Aleksander (1982: 5) emphasises that „language as a social creation is an inseparable part of civilisation and culture of a given society. It reflects the differences in the way of seeing the reality beyond the language, as well as patterns and norms of behaviour”, Lachowicz (1987: 141) notices that „utterances deprived of social and cultural context can be grammatically correct but inappropriate as far as situation requirements are concerned” while Torenc (2007: 9) rightly states that „learning foreign languages is at the same time learning different cultures, and learning different cultures is inseparably connected with learning languages” hence the emphasis of the role of culture in foreign languages teaching and turning the attention of glottodidactics towards intercultural communication⁶.

Materials and Method

For many years European glottodidactics has been postulating for joining the practice of foreign language teaching with the presentation of the realities and culture which resulted in birth of a new glottodidactic sub-discipline called intercultural glottopedagogics, also known by the following terms: die Landeskunde (German), area studies (English), la civilisation (French), la civiltà (Italian) or stranovedenie (Russian). Lack of a similar term relating to the didactics of oriental languages and aspect of presenting oriental cultures and explanation of intercultural differences does not mean that teaching of all languages as well should not be deeply embedded in cultural context, since despite the fact that in currently dominating communicative approach the basic didactic goal is the ability of efficient communication, the undisputable fact is the threat of the efficiency of communication in a given language by the lack of so called intercultural competence⁷. It is defined as the ability to communicate with the representatives of different cultural circles and nations and the ability to build the „bridges of agreement”, in other words - complex ability to manage oneself in the complicated reality of multilingual and multi-cultural contemporary world.⁸

Obtaining such a competence is particularly emphasised by so called intercultural approach to teaching a foreign language with the elements of realities and culture, which is the third – the other two being factographic and communicative – way of approaching the presentation of these issues in the didactics of foreign language teaching (see: Pauldrach, 1992; Gębal, 2006). Each of them had taken the advantage of the achievements of the earlier ones, enriching them with key assumptions of their contemporary psychology, pedagogy, didactics and cultural studies, so they often functioned parallelly and complemented one another.

The oldest of these, the cognitive approach (also known as factographic) was based on conveying the knowledge about the country of a given language with the emphasis on presentation of its history and so called high culture, which in relation to course books meant mixing the cultural and realistic themes in the reading material included in subsequent lessons as the background for the presentation of introduced vocabulary or grammar, but not in the form of special complementary chapters which would not induce grammar or lexical progress.

Communication turn which has been present in foreign language teaching from 1970's has significantly influenced the change of the role of realities and culture in the process of the acquisition of foreign languages. The main goal of a new approach was the formation of the ability of using a foreign language in the same way as native speakers do, so the centre of gravity was transferred onto the development of communicative skills⁹, while teaching the realities and culture was – according to this concept – understood as yet another experience of the learners, which widened their mental horizons and helped them to understand the phenomena of daily culture. Course books contained many authentic texts, plain facts had substituted the guidelines on how to react in the situations which the students might encounter in inter-personal contacts. Communicative approach integrated language teaching with learning about realities and culture, it was directed to the development of socio-linguist

referred to in: Wilczyńska, 2005; Banach, 2003.

⁶ Concept of communication competence in glottodidactics is discussed in detail in the following work: Chwastowicz, 2005; Duszak, 1998; Fleischer, 2002; Harbig, 2005; Kielar, Krzeszkowski, Lukszyn, Namowicz, 2000; Wilczyńska, 2005; Zając, 1997; Zawadzka, 1995.

⁷ The issue of intercultural competence is discussed by: Bandura, 2000; Bandura, 2001; Grucza, 1992; Łyp-Bielecka, 2005; Mackiewicz, 2005; Myczko, 2005; Torenc, 2007; Żylińska, 2003.

⁸ Analysis of the place, the role and the measurement of intercultural competence among the objectives of linguistic education can be referred to in: Myczko, 2005; Komorowska, 1996.

⁹ First communicative textbook of Polish is: W. Martyniuk, *Mów do mnie jeszcze!*, Kraków 1986.

competence of the students; its characteristic features include the integration of teaching realities and culture with teaching the language, directing the attention to everyday culture with simultaneous decrease of the role of high culture, matching the subjects to the interests and needs of the students and encouraging them to undertake communication activities within acquired content, various utilisation of factual knowledge.

Intercultural approach which was promoted until the second half of 1980's moved forward the achievement of the above mentioned intercultural competence, which can be defined as „the complex of analytic and strategic skills in relationship with the representatives of other nationalities. Through the knowledge about other cultures and culturally conditioned forms of behaviour, through their unbiased analysis intercultural competence facilitates sensitizing in relation to culturally conditioned difference, as well as change of the existing attitudes and widens the possibility of interpretation and actions of a given individual through such approach” (Zawadzka, 2000: 67). New approach emphasises close connection between the language and culture, combination of language and psychological skills including the awareness of the existence of various activities and communicative behaviours deriving from the membership in various cultural circles; ability to acquire and utilise the strategies of distinguishing the meanings from the contexts and analysis of possible misunderstandings in communication, the ability to identify various communication styles, but most of all – the readiness to empathize with culturally unfamiliar perspectives, in other words – sociological and cultural sensitizing. Characteristic features of intercultural approach to the realities and culture are: culturally conditioned deepening of the ability to communicate, the attempt to liberate oneself from the stereotypes of perception of unfamiliar cultures, turning the attention to the existence of different, culturally conditioned interpretations of words and patterns of behaviour.

Combination of the achievements of all the discussed approaches to the realities and culture is the eclectic grasp which currently dominates in the didactics of foreign language teaching, since „without basic knowledge about the country of the taught language (cognitive approach) it is not possible to try out the social and cultural skills which condition the proper interaction in target language (communicative approach) and aspiration to the understanding of unfamiliar cultures (intercultural approach)” (Gębal, 2004: 130). It is obvious that each of the mentioned ways of presentation of cultural and realistic issues have imprinted their mark on developed concepts and syllabi which transferred the theoretical assumptions to practical grounds.

In contemporary times, in the era of international communication, the issue of intercultural communication and its implication in a foreign language teaching process interested socio-linguists, sociologists and educationalists specialising in foreign languages. It is quite new academic discipline, which was born in the United States of America, the most scientific research is being run in that country, while in Europe the interest in this issue increased after publishing Common European Framework of Reference for Languages by the Council of Europe in 2001. The issues connected with interculturalism are placed on an honourable spot. The document distinguishes general language competence, which is composed of personal conditioning (*savoir-’tre*) – individual traits of a person, their character, attitudes, motivation, system of values; declarative knowledge (*savoir*) - knowledge deriving from life experiences and school education, knowledge about the world, socio-cultural awareness and sensitivity; procedural knowledge (*savoir-faire*) - ability to use the possessed declarative knowledge, life, social, professional and intercultural skills; the ability to learn (*savoir-apprendre*) - communicative and linguistic sensitivity and general sensitivity and phonetic skills, learning techniques and heuristic skills. And linguistic communication competence which is composed of the following components: socio-linguistic element - knowledge and ability to use such social communication conventions as polite regulations, rules of communication depending on age, sex and social status, communication rituals, language style and register, social and regional variations of the language, and other socio-cultural factors of particular meaning in inner- and cross cultural communication; linguistic element - knowledge and ability to use systemic knowledge about the language such as phonology, morphology, syntax, lexis and semantics independently of socio-linguistic and pragmatic aspects connected with usage of given language forms; pragmatic element - knowledge and ability to use the knowledge about the functionality of language forms (pragmatic functions, acts of speech) cohesion and coherence, functions and determinants of style (irony, parody, etc.), scripts of standard conversations and negotiations.

In Poland¹⁰, the interest in the problems of teaching realities and culture in relation to both foreign language and Polish as a foreign language started as late as in the 1980, when communicative approach appeared, and the discussion on the culture studies in teaching foreign languages¹¹ started which has been going on until present day, however, the first symposium dedicated to the role and place of culture studies in foreign language teaching

¹⁰ Social and cultural aspects of teaching foreign languages in glottodidactics on the example of chosen countries are discussed by Banach, 2003.

¹¹ The culture studies in teaching foreign languages see: Augustynowicz, 2004; Banach, 2003; Derenowski, 2006; Kwolek, 1995; Polok, 2004; Siatkowski, 1977; Żmijewska, 1983.

took place in 1977 in Zielona Góra. Conveying the information concerning the history, culture and tradition of a given language area to the foreigners has almost always been a part of the process of teaching this language, however, in the earlier methodological essays and course books, the issues concerning realities and culture were not present in the same degree and way as can be seen from mid 1990's. These problems were discussed in the widest manner on national Polish conference "Didactics of foreign languages versus cultural competence and intercultural communication. Theory – practice – perspectives" which took place in Poznań. The conference resulted in the publication bearing the same title, which was edited by Mackiewicz. As we can read in the introduction: „Conviction of the fundamental meaning of thinking in intercultural categories in the process of foreign language teaching as well as of the role of socio-cultural competence for both teachers and students is common for many papers. (...) Widely accepted demand of intercultural approach in glottodidactics is often confronted with dull reality, where intercultural content is, more often than not, sidetracked or not present at all. (...) Foreign languages courses are just the place for intercultural meetings. Presentation of cultural standards of the countries of given target language or even referring to stereotypes relating to these countries and nations often lead to reflection upon one's own culture, correction of the attitudes and behaviours and readiness to minimize the tensions in contacts with representatives of a different culture, that is to shaping intercultural competence.” (Mackiewicz, 2004: 11). The content of all the articles and papers clearly points out the necessity to tie practical teaching of a foreign language with the issues including such subjects as history of the countries of given language area, history of literature and culture of those countries, phenomena of folklore, customs and traditions, as well as socio-cultural and socio-linguistic issues, for – as Mazur (1994: 36) emphasizes - „the bigger the socio-cultural gap between the sender and the receiver, the more often it happens that the communication message – next to some common elements - contains components which are removed from each other and cause misunderstandings. The latter may originate not from the content of the message itself, but rather from its interpretation caused, for example, by the difference in custom and moral norms, hence the necessity to introduce the students to basic elements of the knowledge about Polish culture and society.”

Results

The key elements of intercultural competence which has become one of main goals of language educations are thought to be: particular supply of possessed information concerning unfamiliar reality, ability to interpret foreign culture against one's own culture, as well as one's own culture against foreign one, the ability to see and analyse one's own attitude and indications of cultural forms of behaviour, ability to identify misunderstanding and ability to widen the knowledge through conscious approach towards cultural dissimilarity. This knowledge consists of such groups as: daily living; conditions of living; interpersonal relations; systems of values; views and attitudes; body language; social conventions; ritual behaviour, so particular information about culture, history, literature, lifestyle, system of values and mentality of a given social group, which knowledge, understanding and ability to use make up for intercultural sensitivity and translate into particular social, life's or professional skills.

Discussion

Development of already mentioned intercultural competence is closely connected with given stages of teaching a language, since omitting specific cultural norms by a foreigner uttering a communicate containing many language mistakes will be accepted by the native speaker with understanding, whereas the ability of fluent and correct usage of a language is also connected with the expectation of adequately better knowledge of a foreign culture. Choice of the subjects and content of the syllabus at the basic level should enable the students to communicate efficiently in daily situations as well as expressing basic communicative intentions, which is why it is necessary to convey the information about the most important socio-cultural conventions used in communication in a given language. Having finished the course on A level, the students should have no major difficulties in taking part in social conversations and form their utterances in such a way that they are understood for other interlocutors linguistically and socio-culturally in the range of verbal contact and social rites. People starting a language course should also be aware of the basic facts concerning the knowledge about the countries of a given language area which facilitate them functioning in those countries and will make them able to undertake the attempt of understanding the ways of behaviour of the natives.

Level	Language fluency level	Socio-linguistic propriety
A1	Person using the language on this level is able to use and understand colloquial expressions and very simple statements concerning every day needs. They can formulate questions concerning private life, for example about place where people live, people they know and things they possess and is able to answer the questions of such types. They are able to introduce themselves and others. They are able to participate in a simple conversation under the condition that the interlocutor speaks slowly and clearly and is willing to help.	Person using the language on this level is able to enter into basic social relations using polite expressions such as greetings and farewell phrases, introductory phrases and expressions such as please, thank you, I'm sorry.
A2	Person using the language on this level understands utterances and frequently used expressions concerning everyday living. They are able to communicate in routine, simple communication situations requiring only direct exchange of statements on known and typical subjects. They can describe their origin and environment they are living in, and bring up the subjects connected with the most basic needs of everyday life.	Person using the language on this level is able to understand and simply express basic language functions such as obtaining and exchange of information, expressing views and convictions. They are able to participate in social conversations in simple yet efficient way, using the most popular expressions and conversation patterns. They are able to manage themselves in very short social conversations using typical polite greeting and addressative expressions. They are able to formulate invitations, propositions or requests for forgiveness etc. and they are able to react to such expressions.

Table 1: Language fluency level and socio-linguistic propriety – level A. (Europejski system opisu kształcenia językowego: uczenie się, nauczanie, ocenianie, 2003: 33,109)

The content of syllabus which is approved to be realised on the level of language proficiency include general and specific subjects closely connected with own interests of the students. Graduates of B level courses should be able to use the foreign language fluently and spontaneously, in the way allowing them to communicate freely with native speakers. They should be able to differentiate and use the right variation (formal or informal) of the language in accordance to the situation, as well as know the majority of socio-cultural conventions used in communication in a given language including verbal and non-verbal contact and social rituals. Presentation of the knowledge about the countries of a given language area should be complemented with elements comparable with Polish culture.

Level	Language fluency level	Socio-linguistic propriety
B1	Person using the language on this level understands the meaning of the main woof of the message contained in clear, standard utterances which concern known issues and events typical for work, school, leisure, etc. They can manage themselves in most communication situations which can happen when travelling to the region where given language is spoken. They are able to build simple and coherent spoken or written forms on the subjects which are known to them or interest them. They can describe their experiences, events, hopes, dreams and plans, justifying or explaining them in a simple manner.	Person using language on this level is able to express and understand a wide range of language function using the most common forms of their expression in neutral register of the utterance. They are aware of the most important polite conventions and able to act accordingly. They are aware and can look for the signs of the most crucial differences between their own and foreign society as far as customs, traditions, stances, beliefs and values are concerned.

B2	Person using the language on this level understands the meaning of the main woof of the message contained in complex texts about specific and abstract subjects, including the understanding of a discussion on technical terms they specialise in. They are able to use the language so fluently and spontaneously to run a normal conversation with a native speaker. They are able to formulate clear and detailed oral or written utterances and explain their views on issues being the subject of the discussion considering pros and cons of different solutions.	Person using the language on this level can express themselves in convincing, clear and polite way using formal or informal register of the utterance – according to the situation and interlocutor. They are able to participate actively in the group discussion, even if the conversation is quick and colloquial. They are able to run a conversation with native speakers without amusing or irritating them unintentionally. They are able to express themselves adequately to situation and avoid blatant mistakes.
----	--	--

Table 2: Language fluency level and socio-linguistic propriety – level B. (Europejski system opisu kształcenia językowego: uczenie się, nauczanie, ocenianie, 2003: 33,109)

Subject and syllabus on the advanced level include general and specialised language. The graduates of C level courses should be able to use the language fluently and spontaneously in all the communicative situations with native speakers. They should be able to differentiate the shades of meaning and use the variation of language which is appropriate to the situation, what should be facilitated by the knowledge of idioms and slang expressions. During the course on such a level, the students should learn socio-cultural conventions used in a given language including verbal and non-verbal contact, social rituals; they should also possess a substantial knowledge about the countries of a given language area.

Level	Language fluency level	Socio-linguistic propriety
C1	Person using the language on this level understands wide range of difficult, lengthy text and is able to see hidden meanings expressed indirectly. They are able to form fluent, spontaneous utterances quite easily finding the right expressions. They can easily and efficiently use the language in social, public, educational or professional contacts. They are able to form well-built, detailed oral or written forms concerning complex problems, properly and ably using the rules of the organisation of the utterance, and indicators of conjunction of the text.	Person using the language on this level can identify in a wide range idiomatic and colloquial expressions, noticing the changes of the register of the utterance, however, from time to time they need to make sure about some details, especially when they are dealing with unknown accent. They are able to understand the language of the films, including slang and idiomatic expressions. They are able to use the language in social situations in an efficient and flexible way, including allusive, emotional and humorous usage of the language.
C2	Person using the language on this level can easily understand practically everything they hear or read. They can abridge the information originating from different sources (written or spoken) coherently reporting the theses and explanations they contain. They are able to express their thoughts in a fluent, spontaneous and precise manner, subtly differentiating meaning shades even in the most complex utterances.	Person using the language on this level shows good command of idiomatic and colloquial expressions and is aware of connoted meanings. They are able to fully notice socio-linguistic and socio-cultural implications accompanying the utterances of native speakers and are able to react properly. They are able to act as a go-between in communication with the representatives of their own and foreign society, considering socio-cultural and socio-linguistic differences.

Table 3: Language fluency level and socio-linguistic propriety – level C (Europejski system opisu kształcenia językowego: uczenie się, nauczanie, ocenianie, 2003: 33,109)

Thus, the appropriate place of cultural aspects accompanying language behaviour and culturally determined concepts accompanying this behaviour is crucial element of communication competence on every stage of teaching, for language is not only the information channel in the communication process, but each behaviour is a defined communication. Omitting culture and reality elements (or elements conditioned by reality and culture) in the language acquisition process can contribute to the hindrance of communication and adaptation of new cultural codes, or even cause the phenomenon of so called „cultural shock” in the student. Hence the necessity of introducing lexical material marked culturally from the first level of teaching and gradual deepening of the

language competence and knowledge of the culture with its specific elements, approaching the world of values, mentality and stereotypes of a given cultural circle or nation. Certainly, intercultural competence is essential supplementation of the goals of language education in general, including Polish taught to foreigners; its development favours fuller realisation of the superior objective of this education which is communication competence.

Conclusions

To sum up, it is worth to cite the theses on the role of culture studies in teaching foreign languages. Firstly, the contribution to peaceful coexistence of people.¹² Culture studies play central role in this aspect, because it presents the reality of the country of a given language and cultural identity of its citizens. Secondly, the sensitization and development of the ability to deal with unfamiliar cultures through the assessment, relativisation and presentation in juxtapose with the reality of those who learn about culturally unfamiliar phenomena and not by conveying information and plain facts, because in such a way only will they be shown and prejudices and stereotypes removed, while tolerance will be supported. Finally – the lecturers should be the ambassadors of the region of a given language through their own experience and proper choice of didactic material, good education and participation in professional development courses. Describing the didactic and methodical assumptions of conveying reality and cultural information, we can point out the necessity of the form of active confrontation/discussion with foreign cultures through the choice of appropriate material and way of conducting the classes including authentic material, various points of view and contradictions existing in a given society, historical subjects and texts informing about the connections between past, present and future; reference to the traces of foreign cultures in the students' country, and finally – encouraging the students to creative work, awakening the curiosity and desire to discover the new and strange. So important is the role of the lecturers in the realisation of the assumptions of cultural studies¹³, the necessity of education and professional development, cooperation in preparing the material, exchange of information, preparation of appropriate didactics and methodology of the lessons about realities and culture, which should be fully integrated with practical language teaching.

In the literature discussing the issues of the didactics of foreign languages such terms as cultural studies, socio-cultural studies, linguistic and cultural competence, socio-linguistic competence, linguistic-cultural studies and socio-linguistics, etc. are more and more common. The discussion dedicated to the range of material and ways of teaching culture and realities integrated with language teaching has been going on for years, while glottodidactic syllabi contain more and more cultural texts of different types presenting cultural and realistic issues which proves that widely understood knowledge about the countries of a given language area becomes an integral part of foreign language teaching.

References

- Aleksander, Z. 1982. *Elementy lingwo realizacyjne w nauczaniu j. rosyjskiego*. Warszawa: Wydawnictwa Szkolne i Pedagogiczne.
- Anusiewicz, J. 1995. *Lingwistyka kulturowa*. Wrocław: Wydawnictwo Uniwersytetu Wrocławskiego.
- Augustynowicz, J. 2004. „Realizacja na lekcji języka obcego”. *Języki obce w Szkole* 4: 172-173.
- Banach, B. 2003. „Język a kultura”. *Języki Obce w Szkole* 2: 3-5.
- Banach, B. 2003. „Tendencje interkulturowe we współczesnej glottodydaktyce” *Języki Obce w Szkole* 3: 3-15.
- Bandura, E. 2000. „Ewaluacja kompetencji interkulturowej” (in:) *Ewaluacja w nauce języka obcego* (ed. H. Komorowska). Białystok: Wydawnictwo Uniwersytetu w Białymstoku.
- Bandura, E. 2001. „Podejście etnograficzne i porównawcze w nowych materiałach do nauczania kompetencji interkulturowej na lekcji języka obcego” (in:) *European Year of Languages* (ed. T. Siek-Piskozub). Poznań: Wydawnictwo UAM.
- Bandura, E. 2003. „Rola nauczycieli języków obcych w rozwijaniu kompetencji interkulturowej uczniów szkół średnich”. *Neofilolog* 23: 63-69.
- Bartz, B. 1997. *Idea wielokulturowego wychowania w nowoczesnych społeczeństwach*. Radom: ITeE.

¹² Numerous Polish publications are dedicated to the issue of intercultural education. The most important of them include: Lewowicki, 2000; Lewowicki, 2002; Nasalska, 1999; Nikitorowicz, 1995; Nikitorowicz, 1996; Nikitorowicz, 2000; Nikitorowicz, 2001; Nikitorowicz, 2002; Nikitorowicz, 2005; Torenc, 2007.

¹³ The role of the lecturers in the realisation of the assumptions of cultural studies see: Bandura, 2003; Bayer, 1995; Bayer, 1998; Gajda, 1995; Kęmbłowska, 2003; Kurtyka, 2005; Kwiatkowska, 1997; Mackiewicz, 2009; Miłuńska, 2009; Murkowska, Zielińska, 2003; Owczarek, 2005; Ulanicka, 2005; Zawadzka, 2004.

- Bayer, M. 1995. „Kształcenie interkulturowe jako zadanie kształcenia nauczycieli w Europie” (in:) *Edukacja międzykulturowa. W kręgu potrzeb, oczekiwań, stereotypów* (ed. J. Nikitorowicz). Białystok: Trans Humana.
- Bayer, M. 1998. „Przyswojenie kompetencji interkulturowej do wspierania w wymiarze europejskim kształcenia nauczycieli” (in:) *Rozwój nauczyciela w okresie transformacji* (ed. W. Prokopiuk). Białystok: Trans Humana.
- Bednarek, S. 1999. „Problem wielokulturowości we współczesnej polskiej refleksji humanistycznej”. *Teraźniejszość – Człowiek – Edukacja* 3: 65-70.
- Burzyńska, A. 2002. *Jakże rad bym się nauczył polskiej mowy... O glottodydaktycznych aspektach relacji język a kultura w nauczaniu języka polskiego jako obcego*. Wrocław: Wydawnictwo Uniwersytetu Wrocławskiego.
- Chwastowicz, A. 2005. „Komunikacja międzykulturowa w praktyce. Jak i czego uczyć?” (in:) *Dydaktyka języków obcych a kompetencja kulturowa i komunikacja interkulturowa* (ed. M. Mackiewicz). Poznań: Wydawnictwo Wyższej Szkoły Bankowej w Poznaniu.
- Cudak, R., Tambor, J. (ed.) 2001. *Inne optyki. Nowe programy, nowe metody, nowe technologie w nauczaniu kultury polskiej i języka polskiego jako obcego*. Katowice: Wydawnictwo UŚ.
- Dakowska, M. 1994. „Glottodydaktyka jako nauka” (in:) *Polska szkoła lingwistyki stosowanej* (ed. B. Kielar, J. Lewandowski, L. Bartoszewicz). Warszawa: Wydawnictwo UW.
- Dakowska, M. 2002. *Psycholingwistyczne podstawy glottodydaktyki języków obcych*. Warszawa: PWN.
- Derenowski, M. 2006. „Elementy kulturowe w nauczaniu języka obcego”. *Języki Obce w Szkole* 3: 4-7.
- Duszek, A. 1998. *Tekst, dyskurs, komunikacja międzykulturowa*. Warszawa: PWN.
- Europejski system opisu kształcenia językowego: uczenie się, nauczanie, ocenianie* (polska wersja pracy *Common European Framework*). Warszawa: Wydawnictwa CODN.
- Fleischer, M. 2002. *Teoria kultury i komunikacji, Systemowe i ewolucyjne postawy*. Wrocław: Wydawnictwo DSWE.
- Gajda, J. 1995. „Europejskość jako dyrektywa w edukacji nauczycieli” (in:) *Alternatywne modele kształcenia nauczycieli* (ed. M. Ochmański). Lublin: Wydawnictwo UMCS.
- Gębał, P. 2004. „Program nauczania cudzoziemców realiów polskich”. In: W. Miodunka (Ed.), *Kultura w nauczaniu języka polskiego jako obcego*. Kraków: Universitas.
- Gębał, P. 2006. „Realia i kultura w nauczaniu języka polskiego jako obcego” (in:) *Z zagadnień dydaktyki języka polskiego jako obcego* (ed. E. Lipińska, A. Seretny). Kraków: Universitas.
- Gębał, P. 2009. „Realioznawstwo w nauczaniu języka niemieckiego” (in:) *Kultura w nauczaniu języka polskiego jako obcego* (ed. T. Miodunka). Kraków: Universitas.
- Grucza, F. (ed.) 1976. *Glottodydaktyka a lingwistyka. Materiały z II Sympozjum zorganizowanego przez Instytut Lingwistyki Stosowanej UW*. Warszawa: Wydawnictwo UW.
- Grucza, F. 1978. „Glottodydaktyka. Jej zakres i problemy”. *Przegląd Glottodydaktyczny* 1: 29-44.
- Grucza, F. (ed.) 1992. *Język, kultura – kompetencja kulturowa*. Warszawa: Wydawnictwo UW.
- Grucza, F. 1974. „Lingwistyka a glottodydaktyka”. *Języki Obce w Szkole* 3: 133-143.
- Grucza, F. (red.) 1985. *Lingwistyka, glottodydaktyka, translatoryka*, Warszawa 1985.
- Grucza, F. 1979. „Rozwój i stan glottodydaktyki polskiej w latach 1945-1975” (in:) *Polska myśl glottodydaktyczna 1945-1975* (ed. F. Grucza). Warszawa: Państwowe Wydawnictwo Naukowe.
- Harbig, A. 2005. „Komunikacja interkulturowa w biznesie z perspektywy dydaktyki języków obcych” (in:) *Dydaktyka języków obcych a kompetencja kulturowa i komunikacja interkulturowa* (ed. M. Mackiewicz). Poznań: Wydawnictwo Wyższej Szkoły Bankowej w Poznaniu.
- Kempny, M., Kapciak, A., Łodziński, S. (ed.) 1997. *U progu wielokulturowości*. Warszawa: Oficyna Naukowa.
- Kielar, B., Krzeszkowski, T., Lukszyn, J., Namowicz, T. (ed.) 2000. *Problemy komunikacji międzykulturowej: lingwistyka – translatoryka – glottodydaktyka*. Warszawa: Graf-Punkt.
- Komorowska, A. 1996. „Nowe tendencje w pracach programowych Rady Europy: koncepcja celów nauczania języków obcych”. *Języki Obce w Szkole* 2: 109-115.
- Kurtyka, A. 2005. „Rozwijanie kompetencji interkulturowej nauczycieli języków obcych” (in:) *Dydaktyka języków obcych a kompetencja kulturowa i komunikacja interkulturowa* (ed. M. Mackiewicz). Poznań: Wydawnictwo Wyższej Szkoły Bankowej w Poznaniu.
- Kwiatkowska, H. 1997. *Edukacja nauczycieli. Konteksty, kategorie, praktyki*. Warszawa: Instytut Badań Edykatywnych.
- Kwolek, J. 1995. „Elementy realioznawcze na lekcjach języka obcego”. *Języki Obce w Szkole* 4: 306-310.
- Lachowicz, D. 1987. „Komunikacja językowa a kontekst społeczno-kulturowy”. *Języki obce w szkole* 3: 141-146.
- Lewowicki, T. (ed.) 2000. *Edukacja międzykulturowa w Polsce i na świecie*. Katowice: Wydawnictwo UŚ.
- Lewowicki, T. 2002. „W poszukiwaniu modelu edukacji międzykulturowej” (in:) *Pedagogika i edukacja wobec nowych wspólnot i różnic w jednoczącej się Europie. Materiały z IV Ogólnopolskiego Zjazdu Pedagogicznego* (ed. E. Malewska, B. Śliwerski). Kraków: Impuls.
- Lyp-Bielecka, A. 2005. „Nauczanie słownictwa a kompetencja interkulturowa”. (in:) *Dydaktyka języków obcych*

- a kompetencja kulturowa i komunikacja interkulturowa* (ed. M. Mackiewicz). Poznań: Wydawnictwo Wyższej Szkoły Bankowej w Poznaniu.
- Mackiewicz, M. (ed.) 2005. *Dydaktyka języków obcych a kompetencja kulturowa i komunikacja interkulturowa*. Poznań: Wydawnictwo Wyższej Szkoły Bankowej w Poznaniu.
- Mackiewicz, M. 2005. „Jeszcze raz o modelu z Tybingi. Wsparcie kompetencji interkulturowej czy utrwalanie stereotypów?” (in:) *Dydaktyka języków obcych a kompetencja kulturowa i komunikacja interkulturowa* (ed. M. Mackiewicz). Poznań: Wydawnictwo Wyższej Szkoły Bankowej w Poznaniu.
- Mackiewicz, M. 2009. „Nauczyciel języka obcego jako kulturoznawca i mediator interkulturowy” (in:) *Nauczyciel języków obcych dziś i jutro* (ed. M. Pawlak, A. Mystkowska-Wiertelach, A. Pietrzykowska). Poznań-Kalisz: Wydział Pedagogiczno-Artystyczny UAM.
- Mamzer, H. 2002. *Tożsamość w podróży: wielokulturowość a kształtowanie tożsamości jednostki*. Poznań: Wydawnictwo Naukowe UAM.
- Mazur, J. (ed.) 1994. *Kształcenie sprawności komunikacyjnej Polaków ze Wschodu*. Lublin: Wydawnictwo UMCS.
- Mihułka, K. 2009. „Mediator interkulturowy – nowa rola nauczyciela języków obcych” (in:) *Nauczyciel języków obcych dziś i jutro* (ed. M. Pawlak, A. Mystkowska-Wiertelach, A. Pietrzykowska). Poznań-Kalisz: Wydział Pedagogiczno-Artystyczny UAM.
- Miodunka, W. (ed.) 1992. *Język polski jako obcy. Programy nauczania na tle badań współczesnej polszczyzny*. Kraków: Universitas.
- Miodunka, W. (ed.) 2004. *Kultura w nauczaniu języka polskiego jako obcego*. Kraków: Universitas.
- Miodunka, W. (ed.) 2009. *Nowa generacja w glottodydaktyce polonistycznej*. Kraków:
- Murkowska, A., Zielińska, J. 2003. „Różnojęzyczność i wielokulturowość w kształceniu nauczycieli języków obcych”. *Języki Obce w Szkole* 6: 107-111.
- Myczko, K. 2005. „Kompetencja interkulturowa jako cel kształcenia językowego” (in:) *Dydaktyka języków obcych a kompetencja kulturowa i komunikacja interkulturowa* (ed. M. Mackiewicz). Poznań: Wydawnictwo Wyższej Szkoły Bankowej w Poznaniu.
- Nasalska, E. 1999. „Edukacja międzykulturowa w polskiej szkole”. *Kwartalnik Pedagogiczny* 1: 74-85.
- Nikitorowicz, J. 2002. „Edukacja międzykulturowa wobec dylematów kształtowania tożsamości w społeczeństwach wielokulturowych” (in:) *Pedagogika i edukacja wobec nowych wspólnot i różnic w jednoczącej się Europie. Materiały z IV Ogólnopolskiego Zjazdu Pedagogicznego* (ed. E. Malewska, B. Śliwerski). Kraków: Impuls.
- Nikitorowicz, J. (ed.) 1995. *Edukacja międzykulturowa. W kręgu potrzeb, oczekiwań i stereotypów*. Białystok: Trans Humana.
- Nikitorowicz, J. 1996. „Edukacja regionalna, wielokulturowa i międzykulturowa”. In: H. Kwiatkowska, Z. Kwieciński, *Demokracja a oświata, kształcenie i wychowanie. Materiały z II Ogólnopolskiego Zjazdu Pedagogicznego*. Toruń: Wydawnictwo Edytor.
- Nikitorowicz, J. 2005. *Kreowanie tożsamości dziecka. Wyzwania edukacji międzykulturowej*. Gdańsk: Gdańskie Wydawnictwo Psychologiczne.
- Nikitorowicz, J. 1995. *Pogranicze. Tożsamość. Edukacja międzykulturowa*. Białystok: Trans Humana.
- Nikitorowicz, J. 2000. „Spotkanie i dialog kultur – wymiar edukacji międzykulturowej” (in:) *O potrzebie dialogu kultur i ludzi* (ed. T. Pilch). Warszawa: Wydawnictwo Akademickie Żak.
- Nikitorowicz, J. 2001. „Tożsamość międzykulturowa jako efekt edukacji w społeczeństwie międzykulturowym”. *Europejczy* 1: 63-73.
- Nikitorowicz, J. 2000. „Wielokulturowość - wyzwanie dla edukacji międzykulturowej” (in:) *Edukacja zorientowana na XXI wiek* (ed. J. Gajda). Lublin: Wydawnictwo UMCS.
- Nikitorowicz, J. 2000. „Wymiary edukacji w dobie globalizacji (edukacja regionalna, wielokulturowa, międzykulturowa)” (in:) *O nowy humanizm w edukacji* (ed. J. Gajda). Kraków: Oficyna Wydawnicza Impuls.
- Owczarek, D. 2005. „Tekst, realizm a kształcenie kompetencji interkulturowej wśród przyszłych nauczycieli” (in:) *Dydaktyka języków obcych a kompetencja kulturowa i komunikacja interkulturowa* (ed. M. Mackiewicz). Poznań: Wydawnictwo Wyższej Szkoły Bankowej w Poznaniu.
- Pauldrach, A. 1992. „Eine unendliche Geschichte. Anmerkungen zur Situation der Landeskunde in den 90er Jahren”. *Fremdsprache Deutsch* 6: 4-15.
- Polok, K. 2004. „Miejsce tła kulturowego w całościowym przekazie informacji językowych podczas lekcji”. *Języki Obce w Szkole* 4: 14-20.
- Prokopiuk, W. (ed.) 1998. *Rozwój nauczyciela w okresie transformacji*. Białystok: Trans Humana.
- Siatkowski, S. (ed.) 1977. *Elementy realizmowe i literackie nauczania języka rosyjskiego*. Warszawa: Wydawnictwa Szkolne i Pedagogiczne.
- Stawna, M. 1991. *Podejście komunikacyjne do nauczania języków obcych. Od teorii do praktyki*. Warszawa: Wydawnictwa Szkolne i Pedagogiczne.

- Torenc, M. 2007. *Nauczanie międzykulturowe – implikacje glottodydaktyczne*. Wrocław: Oficyna Wydawnicza Atut.
- Ulanicka, M. 2005. „Źródła kompetencji socjokulturowej nauczyciela” (in:) *Dydaktyka języków obcych a kompetencja kulturowa i komunikacja interkulturowa* (ed. M. Mackiewicz). Poznań: Wydawnictwo Wyższej Szkoły Bankowej w Poznaniu.
- Wilczyńska, A. 2005. „Czego potrzeba do udanej komunikacji międzykulturowej” (in:) *Dydaktyka języków obcych a kompetencja kulturowa i komunikacja interkulturowa* (ed. M. Mackiewicz). Poznań: Wydawnictwo Wyższej Szkoły Bankowej w Poznaniu.
- Zajęc, J. 1997. „Od nauczania cywilizacji do refleksji interkulturowej na lekcji języka obcego”. *Języki Obce w Szkole* 3: 195-199.
- Zarzycka, G. 2000. *Dialog międzykulturowy. Teoria i opis komunikowania się cudzoziemców przyswajających język polski*. Łódź: Wydawnictwo UŁ.
- Zawadzka, E. 2000. „Glottodydaktyczne aspekty interkulturowości” (in:) *Problemy komunikacji międzykulturowej: lingwistyka – translatoryka – glottodydaktyka* (ed. B. Kielar, T. Krzeszkowski, J. Lukszyn, T. Namowicz). Warszawa: Graf-Punkt.
- Zawadzka, E. 1995. „Kilka uwag o komunikacji interkulturowej”. *Neofilolog* 10: 28-34.
- Zawadzka, E. 2004. *Nauczyciele języków obcych w dobie przemian*, Kraków: Oficyna Wydawnicza Impuls.
- Żmijewska, H. 1983. *Elementy realizacyjne w nauce języków obcych*, Warszawa: Wydawnictwa Szkolne i Pedagogiczne.
- Żylińska, M. 2003. „Podejście interkulturowe, czyli o konieczności zmian w nauczaniu języków obcych”. *Języki Obce w Szkole* 6: 49-62.

E-Learning Readiness in Medicine: Turkish Family Medicine (FM) Physicians Case

Alaattin Parlakkılıç
Gülhane Military Medical Academy Turkey

Abstract: This research investigates e-learning readiness of family medicine physicians in Turkey. The study measures the level of e-learning readiness of Turkish FM physicians. A cross-sectional survey was delivered online. Overall, to implement successful e-learning framework family medicine physicians in Turkey the results show that overall five areas are ready at Turkish FM but need a few improvements: *equipment/infrastructure*, Online learning style readiness, technological skills readiness, cultural readiness, financial readiness. Three areas are not ready and need some work to improve their readiness: *Human resource readiness, attitude readiness, and environmental readiness*. According to outcomes of e-learning readiness survey Turkish Family Medicine Physicians' e-learning readiness indicate that the physicians are for adopting e-learning. The results show that the level readiness at Turkish FM was ready at 68,28 %, and ready but needs a few improvements for readiness.

Keywords: E-learning readiness, medical education, family medicine physicians.

INTRODUCTION

For family medicine (FM) physicians in Turkey, working conditions and office hours are intense. The Minister of Health of Turkey announced by March 2014 that there are 21,300 family medicine physicians in Turkey, with more than 3,500 patients per physician, a very large number. How can training effectively occur when physicians leave their medical center or facility? Heavy workloads mean that family medicine physicians may not be able to find opportunities to take traditional continuing education courses but e-learning provides them with an opportunity to learn anytime and anywhere. Since much knowledge acquisition occurs outside of working hours, e-learning is a supportive tool in continuing medical education.

The research aims to investigate e-learning readiness for proposing a successful e-learning design for family medicine (FM) physicians in Turkey. Subsequently, it intends to determine factors that need to be addressed in order to implement successful e-learning in this context. The proposed research focused on: reviewing and adapting a survey instrument from previous studies; executing a comprehensive e-learning readiness instrument for the research context; assessing family medicine (FM) physicians e-learning readiness; and identifying factors that need to propose a successful e-learning design.

LITERATURE REVIEW

Health professionals need to regularly update their knowledge of changes and advances in medical sciences, technologies and techniques. This activity is often called continuing professional education (CPE) or continuing medical education (CME). CME is usually acknowledged as an indispensable part of the working life of physicians and health professionals (Fordis, King, & Ballantyne, 2005).

The use of e-learning enables medical students to engage with high quality teachers and doctors around the world in both real time and at asynchronous learning events (Edward et al., 2006). In medical education, content can be delivered either synchronously or asynchronously. Synchronous delivery refers to real-time, instructor-led e-learning, where all learners receive information simultaneously and communicate directly with other learners. With asynchronous delivery, the transmission and receipt of information do not occur simultaneously. The learners are responsible for pacing their own self-instruction and learning. The instructor and learners communicate using e-mail or feedback technologies, but not in real time. Synchronous content delivery is hard to achieve in medical education without some preconditions needed such as high speed Internet connections, free access to computers and high computer skills of students and teachers (Masic, 2008).

The e-learning readiness dimensions

A number of instruments have been developed to assess e-learning readiness. Aydin and Tasci (2005) developed an E-Learning Readiness Survey (ELRS) to assess how managers perceive their institution's readiness for e-learning in Turkey and to investigate whether managers' demographic characteristics (gender, age, education, and computer experience) differentiate their perception of institutional readiness for e-learning. The study revealed that although the companies surveyed were ready for e-learning overall, to successfully implement e-learning they needed to improve their human resources. The results confirmed that gender, age, education level, and computer experience had no effect on participants' overall perception of institutional readiness.

An E-Learning Readiness (ELR) instrument was developed by Abas, Kaur, and Harun (2004) to assess e-learning readiness in Malaysia. The study revealed that enablers and receivers were less ready than policy makers and providers. The study confirmed that although there was a large amount of resources for management and technical facilities, more financial assistance was still needed to improve the infrastructure in Malaysia. Enablers and receivers also needed to improve their readiness in three areas: content, technical, and environmental.

An instrument to examine Tertiary Students' Readiness For Online Learning (TSROL) was developed by Pillay, Irving, and Tones (2007). Three key points were identified: (1) the *learner preferences* subscale required revision as it had poor reliability and validity; (2) older students had lower *technical skills* and *computer self-efficacy* than younger students; and (3) TSROL can be improved by adopting a more multidimensional interpretation of the *learning preferences* and *attitudes towards computers*.

Sadik (2007) developed an instrument to measure individual readiness to develop and implement e-learning (IRDI-EL). The study aimed to determine the state of readiness of academic staff at South Valley University in Egypt to implement e-learning strategies in their teaching; and how support systems and procedures for staff could be further developed, enabling the most effective and appropriate use of learning technologies and enhancing the student and staff experience. The study revealed that competencies, experience and attitudes affect faculty's individual readiness to successfully develop and implement e-learning approaches.

The E-Learning Readiness Self-Assessment (ELRSA) was developed by Watkins, Leigh, and Triner (2004) to assess the readiness of individual learners who have no previous e-learning experience in an online learning environment. The instrument had six self-assessment categories: *technology access*; *online skills and relationships*; *motivation*; *online audio/video*; *Internet discussions*; and *importance to your success*. The researchers claimed that the six scales were reliable; however they only measure readiness from the perspective of learners.

The instruments for assessing e-learning readiness were mainly formulated for institutions that were already familiar with e-learning. Furthermore, this study identified eight main dimensions to measure e-learning readiness that had been found in previous researches. This study regroups these dimensions into a more concise set of dimensions to assess e-learning readiness. After assessing e-learning readiness, it proposes an e-learning framework based on e-learning readiness survey and educators interview results.

In our study, the e-learning readiness dimensions were grouped into eight dimensions based on previous researches. The dimensions are defined as follows:

Technological skills readiness: Technological skills readiness refers to the observable and measurable technical competencies involving users' capabilities with computers and the Internet

Online learning style readiness: Users' online learning style readiness defined as the readiness of the learner or trainee in terms of time commitment to e-learning, discipline and interest in e-learning and the perception of the status of qualifications obtained via e-learning.

Equipment/infrastructure readiness: This dimension is defined as the right equipment/infrastructure readiness, provision of technical support, e-learning content delivery, broadband facilities, and a Learning Management System(LMS) by the organizations which adopt the systems.

Attitude readiness: User attitudes are factors that influence the use of technology. Attitude readiness in this study involves confidence, enjoyment, importance, motivation, self-development, and anxiety.

Human resources readiness: Human resources readiness is the availability and design of the human support system.

Environmental readiness: Environmental readiness involves the readiness of the institution as a whole in terms of government policy, the role of mass media, and intellectual property regulations.

Cultural readiness: Cultural readiness is the enculturation of e-learning in terms of Internet use and networked Technologies to disseminate information, communication, interaction and teaching.

Financial readiness: This concept refers to whether a learner/trainee or an institution is financially ready for e-learning programs.

METHODOLOGY

The research employed a quantitative method based on survey. Data was collected through an e-learning readiness survey. To measure e-learning readiness, the study proposes eight dimensions of readiness drawn from the literature review: (1) *technological skills*; (2) *online learning style*; (3) *equipment /infrastructure*; (4) *attitude*; (5) *human resource*; (6) *environmental*; (7) *cultural*; and (8) *financial*. The questionnaire was divided into three sections: A, B, and C. Section A: Demographic –contains five questions to collect demographic characteristics from the individuals including age, gender, education level, the institution they belong to, and their position in the institution. Section B: Communication issues – contains four questions to collect individuals' communication and internet access information. Section C: E-learning readiness dimensions – contains eight variables of e-learning readiness dimensions. A five-point *Likert* scale was used to ask about opinions.

The results from the regression analysis will indicate the level of e-learning readiness of family medicine physicians. The results will be compared with assessment model of Aydin and Tasci's (2005), which was used to determine the expected level of e-learning readiness.

RESULTS

Online survey was administered to the physicians of Turkish FM. Online survey was administered to the physicians of Turkish FM and a total of 1172 family physicians, 71.8% of the men and 28.2% women, attended to survey 87.8% physicians are married

This section presents the quantitative data analysis. It evaluates each dimension of readiness for Family Medicine Physicians in Turkey. This section also addresses the level of readiness for Family Medicine Physicians in Turkey in each dimension, and identifies critical factors that need to be considered in order to implement successful e-learning framework.

The assessment of readiness in this study was developed based on a process used by Aydin and Tasci (2005). A five-point Likert scale in which each answer was coded into 1, 2, 3, 4, and 5 therefore the critical level was 0.8 (4 intervals divided by 5 categories). Aydin and Tasci (2005, p. 250) added this critical level iteratively from the lowest category "1" until reaching the highest point "5"; accordingly five intervals of readiness were obtained and they considered 68,28 (3.4) as the expected level of readiness.

Table1 presents the percentages of e-learning readiness for implementing Family Medicine Physicians in Turkey. The level of readiness in each dimension was assessed individually. Each percentage of readiness was calculated by using this formula as presented in Table 1,

Three areas are not ready and need some work to improve their readiness: *Human resource readiness, attitude readiness, and environmental readiness*.

Table1. Overall readiness of Turkish FM Physicians

Equipment/infrastructure readiness	77,64
Online learning style readiness	75,13
Technological skills readiness	74,47
Cultural readiness	73,81
Financial readiness	73,26
Human resource readiness	65,86
Attitude readiness	64,22
Environmental readiness	52,6
Overall Readiness	68,28

Technological skills readiness

The results show that the level of *technological skills readiness* at Turkish FM was ready at 74,47%, and ready but needs a few improvements for readiness. Figure x presents the summary of *technological skills readiness*

Online learning style readiness

The results show that the level of *online learning style readiness* at Turkish FM was ready at 75,13%, and ready but needs a few improvements for readiness. Figure x presents the summary of *online learning style readiness*.

Infrastructure/equipment readiness

The results show that the level of *infrastructure/equipment readiness* at Turkish FM was ready at 77,64%, and ready but needs a few improvements for readiness. Figure x presents the summary of *infrastructure/equipment readiness*.

Attitude readiness

Attitude readiness ranked at 64,22%, indicating that it is not ready but needs some work and improvements.

Human resource readiness

The results show that the level of *human resources readiness* at Turkish FM was ready at 65,86%, and not ready needs some work for readiness.

Environmental readiness

Environmental readiness refers to the level of readiness of a society/nation for e-learning as perceived by stakeholders (policy makers, providers, enablers, and learners/trainees) from within and outside the institution, and involves the readiness of the institution as a whole in terms of government policy, the role of mass media, and intellectual property regulations. The results show that the level of *environmental readiness* at Turkish FM was ready at 52,6%, and not ready and needs some work for readiness. This dimension is vital for Turkish family medicine and urgently must be improved.

Cultural readiness

The results show that the level of *cultural readiness* at Turkish FM was ready at 73,81%, and ready but needs a few improvements for readiness.

Financial readiness

The level of readiness on *financial readiness* was a low 73,26% indicating that it was moderately ready and people can afford and ready but needs a few improvements for readiness.

CONCLUSION

As a result the e-Learning context, advancement in network technologies, e-learning technologies, and content development has facilitated multiple content presentations, personalization and e-learning. According to results five areas have been seen that are ready but need a few improvements. These areas are Equipment/infrastructure readiness, Online learning style readiness, Technological skills readiness, cultural readiness, and Financial readiness. Three areas are not ready and need some work to improve. These areas are Human resource readiness, Attitude readiness, and Environmental readiness. The results show that the level readiness at Turkish FM was ready at 68,28 %, and ready but needs a few improvements for e-learning readiness.

REFERENCES

- Abas, Z.W., Kaur, K. &Harun, H. (2004). E-learning Readiness in Malaysia 2004. A Join Study by the Ministry of Energy, Water and Communications Malaysia and Open University Malaysia
- Aydin, C.H. &Tasci, D. (2005). Measuring readiness for e-learning: Reflections from an emerging country. *Educational Technology & Society*, 8(4), 244-257.
- Edward, H.,&Shortliffe, E.,&Leslie, E.,&Perreault,E.(2006). Medical informatics computer application in health care andnbiomedicine. Springer, 3rd edition, 623-4.
- Fordis, M., King J,E., Ballantyne, C.,M (2005). Comparison of the instructional efficacy of Internet-based CME with liveinteractive CME workshops: a randomized controlled trial. *J Am Med Assoc* 2005; 294:1043–1051.
- Masic I. (2008).E-Learning as New Method of Medical Education. *Acta Inform Med*. 2008;16(2):102–117.
- Pillay, H., Irving, K., & Tones, M. (2007). Validation of the diagnostic tool for assessing tertiary students' readiness for online learning. *Higher Education Research & Development*, 26(2), 217-234.
- Sadik, A. (2007). The readiness of faculty members to develop and implement ELearning: The case of an Egyptian university. *International Journal of ELearning*, 6(3), 433-453.
- Watkins, R., Leigh, D., &Triner, D. (2004). Assessing readiness for e-learning. *Performance Improvement Quarterly*, 17(4), 66-79.

Freeware and Open Source Software Tools for Distance Learning in Mathematics

Farha Sattar¹, Laurence Tamatea², Muhammad Nawaz³

¹Charles Darwin University, School of Academic Language and Learning, Darwin, Australia
farha.sattar@cdu.edu.au

²Charles Darwin University, School of Education, Darwin, Australia
laurence.tamatea@cdu.edu.au

³Charles Darwin University, School of Academic Language and Learning, Darwin, Australia
muhammad.nawaz@cdu.edu.au

Abstract: With the contemporary growth of modern technology a number of free and open source software tools have been emerged to support online or distance education for basic level Mathematics. Technological aids for example; digital learning material, videos, recorded lectures, open tools to solve mathematical problems, online discussion boards, and online classrooms enhance the ability of students to solve mathematical problems. This research paper enlists the freeware and open source software tools for teaching and learning in mathematics and describes the role of technology for improved delivery of mathematical concepts. It also shows that how freeware and open source software tools are useful for distance education to achieve learning outcomes in a better flexibility and dynamism than ever before.

Key words: Freeware, Open Source Software Tools, Distance Learning, Basic Level Mathematics

Introduction

Advancement in technological developments has opened up the new ways in teaching and learning basic level mathematics. State of the art computers, user friendly software and interactive communication technologies have introduced the new methods of teaching and learning. Availability of a range of free and open source software tools for basic level mathematics can play a vital role in mathematics teaching and learning particularly in distance learning environment.

Free software also known as 'software libre' or 'libre software' is software that can be used, modified, copied and redistributed either without any restriction or with restrictions allowed by the manufacture and are generally available without any charge (Subramanyam and Xia 2008). Open source software (OSS) is software that is available in source code under a software license that permits users to study, modify, improve and distribute information to other users (Hauge, Ayala et al. 2010). Open source software is available within the public domain and individuals who have expertise in software development and an interest in its free distribution very often develop it collaboratively. OSS is not generally subject to copyright restrictions and access to the source code means that software developers can modify it for their own particular purposes. Free and open source software does not necessarily mean inferior or substandard software. There are some very significant open source software products that have revolutionized many areas of activity. Probably the most famous open source software is the operating system UNIX, now by far the mainstay of large computer installations and even PC operating systems such as Linux and Mac OSX. Using open source software can provide some advantages, the most significant being usually a cost advantage (Ven, et al. 2008).

One of the problems faced by educators who are interested in using free and open source software as alternatives to commercial software for basic level mathematics education is first identifying what alternative free and open source software is available, what the software does, and where it can be accessed from. Currently there is no one place with information on free and open source software for basic level mathematics education. In undertaking the research for this paper, to identify appropriate free and open source software, different categories of software are identified and enlisted that can be used for teaching and learning for basic level mathematics.

Freeware and Open Source Tools for Distance Learning in Mathematics

Freeware and open source software tools like calculators, interactive geometry softwares, computational softwares, visual Maths applications and equation solver have given new direction in basic level mathematics teaching and learning. iPods, iPad, iPhone and Android apps are playing a pivotal role for teaching

mathematics at primary to secondary and even higher levels of education. Use of such tools is supporting student's learning in terms of problem solving and computational fluency.

Distance learning has become an increasingly important part of educational programs. Computers, video phones, interactive graphics, discussion boards and interactive whiteboards are being used as an integral component of distance learning. Electronic learning (e-learning) as a form of distance learning is being promoted as the educational medium of the future (O'Malley, 1999). Educational institutes are extending their digitally linked resources and providing a flexible delivery of content material. Means and Haertel, (2004) argue that technology supports learning process when appropriately integrated with teaching pedagogy, curriculum, and assessments.

Technology aids and facilitates the distance learning process by enhancing communication and collaboration and building strong education communities. Communication software is enabling better discourse among students, collaborative learning, and discussion forums and out of class learning. In this perspective communication software enable teachers to have better awareness of their students and assist student to learn from their peers.

Growing number of technology have caused a shift from a focus on local resources to global resources. With the help of technology better websites, portals and various electronic resources can be created and developed which can be used for lesson planning and better transmissive of knowledge. In the context of distance education communication technologies has provided a favorable space and environment to share knowledge and beliefs about mathematics. Table 1, 2 & 3 provides some online free resources for maths teachers that can be used in distance education for improved delivery of mathematics teaching.

LibreOffice math is a tool used for mathematics documents creation provides feature of a full office suite e.g. Word processor, Presentation, Spreadsheets and Database). This interactive and easy to use tool has the possibility to create worksheets and exam for mathematics.

Xournal in combination with a tablet computer and a projector serves as a cost effective interactive whiteboard. The main advantage of Xournal is that hand written lecture notes can be saved digitally and are accessible for later use.

Online mathematics resources Classroom Aid, <http://classroom-aid.com/educational-resources/mathematics/#respond> combine free math lessons, videos and activities. These resources covers a variety of Maths topics; Algebra, Plane Geometry, Trigonometry, Calculus, Coordinate and Solid Geometry.

Use of software in Mathematics teaching and learning provides a number of benefits in cognitive process; first, memory load of students is reduced and problem solving process is clearer. Second, cognitive load is shared by reducing computation time. Third, provide a clear display of problem that contributes to have a better insight into a problem which leads to better student engagement towards problem solving. Fourth, software support logical reasoning and help students to test hypothesis (Lajoie, 1993).

Technology in maths teaching can be used either as a constructional toolkit or its role can be only to do maths more efficiently and quickly (Olive and Makar, 2010). Keeping same concept in view mathematics software has been classified in two categories. First, emphasize on visualization and enable students to understand maths concepts easily and more clearly (Table 2) and second, are more focused on calculation and computation of complex problem (Table 3). This classification should not create the misconception that computational software doesn't have visualization ability or visualization softwares are not capable of fast computation instead classification is based upon the stronger aspect of the software.

Table 1: Online mathematical resources and tools for mathematics teaching and learning

Online Mathematics Resources	Tools for Mathematics Documentation Creation	Videos
<ul style="list-style-type: none"> • Math Open Reference, http://www.mathopenref.com/ • RealWorldMath, http://www.realworldmath.org/ • HelpingwithMath (http://www.helpingwithmath.com/) • A+ Click Maths, http://www.aplusclick.com/ • Free Math Help, http://www.freemathhelp.com/ 	<ul style="list-style-type: none"> • LibreOffice Math, http://www.libreoffice.org/discover/math/ • Xournal Digital Notebook-Math Worksheet Generator http://www.pil-network.com/Resources/Tools/Details/852875ce-b376-4b49-8f79-41c5cd75b067# • Math Editor , http://www.openmath.org/software/ 	<ul style="list-style-type: none"> • Karl Fisch’s algebra movies, http://karlfisch.wikispaces.com/algebra+videos • Khan Academy , http://www.khanacademy.org/

Software for Visual Representation of Mathematical Concepts

Visualization is the ability to draw mental images, visualization software helps to conceptual understanding of complex mathematics topics. Mathematical visualization software (Table 2) offers multiple visual representations of mathematical concepts into real form with the aid of special computer graphics, diagrams, geometric figures and moving images helps students to understand complex mathematical phenomena. In this way software facilitate the process of mathematical learning by enhancing critical and higher order thinking and logical reasoning in a dynamic environment. These characteristics make them a ‘construction toolkit for mathematical learning’.

Geogebra is a free, open source, multiplatform, dynamic mathematics software. Integration of dynamic geometry, algebra, calculus, and spreadsheet features into a single interactive package make it different from other mathematical software packages. Strong connection of algebra and geometry offers the multiple representations of mathematical concepts.

Sage was developed with the goal to promote open, collaborative and cooperative tools for math learners that can be used an alternative to high cost licensed software such as Maple, Mathematica, Magma, and MATLAB.

GeoEnzo is specially build for mathematics teaching with main feature, easy to draw various types of geometrical shapes such as triangle, circle, cube, line, cones and many more allow teachers to teach geometry more confidently and easily. GeoEnzo is a windows application that offers the option of instruction languages to English, German, French, Spanish and Dutch.

Graph is an open source application which helps to draw mathematical graphs in a user friendly environment. This application can be used to draw mathematical graphs in a coordinate system. There is possibility to visualize a function and past it into other mathematical programs. Graph provides the possibility to insert point series, trend lines, relations and labels, as well as create custom functions and constants.

PTC Mathcad Express can be used to solve, analyze, document and share calculations. This is free engineering math software which has functions to work with symbolic algebra and 3D plots. It helps to visualize complex datasets qualitatively and quantitatively. Works as an extension of Microsoft Excel and have a leverage data in existing spreadsheets.

Table 2: Software for Visual Representation of Mathematical Concepts

Software	Brief Description	Operating System	Website
GeoGebra	GeoGebra provides a sound platform to math students to learn math and solve mathematical problems of various topics such as linear programming, complex numbers, vectors, probability, discrete mathematics, calculus, statistics, algebra, functions and graphs, geometry etc.	Windows	http://www.geogebra.org/cms
Sage	Sage supports research and teaching in algebra, geometry, number theory, cryptography, numerical computation, and related areas.	Linux, Mac OSX, Windows	http://www.sagemath.org/index.html
GeoEnzo	With the help of this freeware mathematics teacher can teach geometry to math students. This freeware lets you easily draw various types of geometrical shapes such as cone, triangle, circle, cube, line and many more. This freeware is very useful for teaching geometry to math students.	Windows	http://geoenzo.com/geoenzo/geoenzo.htm
Graph	Graph is an open source program which helps to draw mathematical graphs in a user friendly environment. Graph provides the possibility to insert point series, trend lines, relations and labels, as well as create custom functions and constants.	Windows	http://graph.software.informer.com/4.3/
PTC Mathcad Express	This is free engineering math software which has functions to work with symbolic algebra and 3D plots. It helps to visualize complex datasets qualitatively and quantitatively.	Windows	http://www.ptc.com/product/mathcad/download-free-trial

Computational Software Tools

Computational software helps to solve algebra problem quite easily. Table 3 gives a brief description of a range of computational software tools. Here we have briefly describes the most useful computational tools. For example, Microsoft mathematics software helps this free ware have feature of drawing two dimensional and three dimension images which is a value addition to its computational capabilities. CompliCalc includes algebraic calculators and allow calculating square root, factorial, discount and distance. Other good examples of computational software are; SpeQ Mathematics, Euler Math Toolbox, Xfunc, Tibi's Mathematics and MathforChild.

SpeQ Mathematics provides in built support to solve equation and working with variables. General function calculations can be cried out easily. Trigonometric problems can also be solved using SpeQ mathematics. Euler Math Toolbox also offers the functionality to solve simple to complex equations.

Using Xfunc various types of equations in mathematics can be written and solved. You can utilize various functions to make different mathematical expressions with the help of Xfunc.

Tibi's Mathematics Suite is useful for to solve mathematical problems of graphs, matrices, permutation and combinations. Online digital calculators offer a range of functionality form very basic level of mathematics to very advanced mathematics level. Calculators for kids are used to carry out simple mathematical operations such as addition, subtraction, multiplication and division.

MathforChild, is free software basically developed for young kids to teach Maths in a friendly and fun way. This is interactive software that support audio mode that enables kids to learn and explore mathematics easily and quickly.

Table 3: Computational Software

Computer Algebra System			
Software	Brief Description	Operating System	Website
Microsoft Mathematics	Microsoft Mathematics is a free math software for your computer. With the help of this freeware math students can solve complex math problems easily. It basically helps math students to solve problems in algebra. Apart from that you can also draw 3D and 2D images with the help of this utility. The main objective of this freeware is to teach students the basic of math, physics and chemistry.	Windows	http://download.cnet.com/Microsoft-Mathematics-32-bit/3000-20417_4-75450134.html
Maxima	Maxima is simply a command line interface (CLI) that provides access to different commands that can be used to solve symbolic and numerical expressions including differentiation, integration, Taylor series, Laplace transforms, ordinary differential equations, systems of linear equations, polynomials, and sets, lists, vectors, matrices, and tensors	Linux, OSX, Windows	http://andrejv.github.io/wxmaxima/
XCAS	Xcas is an interface to perform computer algebra, function graphs, interactive geometry (2-d and 3-d), spreadsheet and statistics, programming.	Linux, OSX, Windows	http://www-fourier.ujf-grenoble.fr/~parisse/giac.html
CompliCalc	This freeware also includes various functional and algebraic calculators. CompliCalc lets you perform a wide variety of operations such as calculate square root, factorial, discount and distance. To use this freeware you need to specify the task you want to perform on the main interface of this freeware.	Windows	http://sourceforge.net/projects/complicalc/
General Calculation Software			
SpeQ Mathematics	SpeQ Mathematics helps to learn math and solve complex problems in mathematics. It has inbuilt support for a wide variety of variables, constants and mathematical functions.	Windows	http://download.cnet.com/SpeQ-Mathematics/3000-2053_4-10634760.html
Euler Math Toolbox	With the help of this software you can carry out various calculations in mathematics such as subtraction, addition, calculus problems, algebra, matrices, functions and complex equations. This freeware is very useful for math students as they can solve nearly all types of mathematics problems by using this freeware.	Windows	http://sourceforge.net/projects/eumat/
Xfunc	By using this software you can write various types of equations in mathematics solve them and also see their solutions. You can utilize various functions to make different mathematical expressions with the help of Xfunc.	Windows	http://www.softpedia.com/get/Science-CAD/xFunc.shtml
Tibi's Mathematics Suite	Tibi's Mathematics Suite lets you solve mathematical problems in various topics such as graphs, matrices, permutation and combinations etc. Tibi's Mathematics Suite also includes a scientific calculator.	Windows	http://sourceforge.net/projects/tibimathematics/

MathForChild	With the help of this freeware your kids can learn mathematics easily. MathForChild will teach various math operations such as multiplication, subtraction and addition to your kids. This software is very useful for kids as they can learn and explore mathematics easily and develop problem solving skills.	Windows	http://mathforchild.en.softonic.com/
--------------	--	---------	---

We have already indicated one of the main adventures in using open source software that is they are generally free. However, the cost of operating and using software is not always just to do with the purchase of that software, but may also include maintenance and support of the software installation, and indeed, may require the purchase of additional hardware. Any teacher or institution considering implementing an open source solution will need to weigh up all of the advantages and disadvantages of doing so. In any case, a full evaluation of an installation should be undertaken before opening up software to staff and students.

A further advantage of using open source software is that it ensures that users are compliant with copyright law. Copyright is an important consideration in the application of any software within education institutions. However, quite often in institutions in developing countries, administrators and teachers are less concerned about copyright issues and there have been instances where pirated copyrighted software have been used illegally. The use of open source and free software clearly makes issues of copyright less a problem.

In addition to the software useful for teaching and learning in mathematics that is listed in the table from, there are other useful and often quite sophisticated open source software available for education purposes. For example, Moodle is an open source Learning Management System used by many universities throughout the world including some of the world’s largest universities (for example, UK Open University). Also, the open source office suite of programs provided by OpenOffice.org is an excellent free substitute to the Microsoft Office suite.

Conclusion

Our review shows that free and or open source software tools are available for most of the areas where computer software is used for mathematics teaching and learning. A more detailed examination also reveals that several free and open source software tools are as good as proprietary software, particularly for conceptual construction and mathematic efficiency. However, if an institute chooses to use free and open source tools for mathematics teaching and learning then the appropriateness of the particular software tools needs to be assessed. The licenses used by free and open source tools typically ensure that there is no cost for the software itself and low or no cost for its acquisition and installation. However, there may be cost implications for management, support and maintenance of the software. Much open source software is customizable and adaptable to different teaching and learning context. In short, we believe that the use of free and open source mathematics software can provide a viable alternative to proprietary software – and we hope that this brief review helps to increase access and use of free and open source mathematic software for basic level teaching and learning.

References

Hauge, O. et al, 2010. *Adoption of open source software in software-intensive organizations - A systematic literature review*. Information and Software Technology, Vol 52, No.11, pp 1133-1154.

Means, B., & Haertel, G. (Eds.). (2004). *Using technology evaluation to enhance student learning*. New York: Teachers College Press.

Lajoie, S. (1993). *Computing environments as cognitive tools for enhancing learning*. In S. Lajoie & S. Derry (Eds.), *Computers as cognitive tools*, (Vol. 1, pp. 261-288). Hillsdale, NJ: Lawrence Erlbaum Associates.

Law, N. (2009). *Mathematics and science teachers' pedagogical orientations and their use of ICT in teaching*. Education and Information Technologies, 14(4), 309-323. <http://dx.doi.org/10.1007/s10639-009-9094-z>

Means, B., & Haertel, G. (Eds.). (2004). *Using technology evaluation to enhance student learning*. New York: Teachers College Press. National Academy Press.

Olive, J., & Makar, K., with V. Hoyos, L. K. Kor, O. Kosheleva, & R. Straesser (2010). *Mathematical knowledge and practices resulting from access to digital technologies*. in C. Hoyles & J. Lagrange (Eds.), *Mathematics education and technology – Rethinking the terrain. The 17th ICMI Study* (pp. 133–177). New York: Springer.

O'Malley, J. (1999). *Student perceptions of distance learning, online learning and the traditional*
Subramanyam, R. and M. Xia (200). Free/Libre Open Source Software development in developing and developed countries: A conceptual framework with an exploratory study. *Decision Support Systems*, Vol.46, No.1, pp 173-186.

Ven, K., Verelst, J. and Mannaert, H. (2008) *Should you adopt open source software? Software, IEEE* Vol.25, No.3 pp 54-59.

Motivation and Retention: A Comparison between Fully Online Students and On-Campus Students Taking Online Courses

Ernesto Gonzalez, Ph.D.

4425 W Jose Regueiro (20th) AVE, Hialeah, FL 33012.

egonzalez@fnu.edu

Abstract: The objective of this study is to assess the impact of intrinsic motivation, extrinsic motivation, and amotivation on retention for online students and on-campus students taking online courses at Florida National University. The descriptive analysis, which was based on the self-determination theory, used the Academic Motivation Scale adapted to online setting. The results show high values of intrinsic and extrinsic motivation for the two groups of students, but no statistical significant differences. However, the values of amotivation and the intention to continue taking online courses (retention) were statistically different. Structural equation modeling revealed that intrinsic and extrinsic motivation had a positive impact on retention for both groups. On the other hand, amotivation had a significant negative influence.

Keywords: Online learning, online education, intrinsic motivation, extrinsic motivation, amotivation; retention

INTRODUCTION

The growth of online learning has been practically unstoppable due to the advantages it offers for those who cannot attend classes physically. Current trends reveal that many educational institutions now consider online education critical to their long-term strategy. The number of students taking at least one online course expanded for the past seven years, surpassing the growth of overall higher-education enrollment. For example, in 2010, the number of online students was 6.1 million, a 10% increase from the total in fall 2009. The average yearly growth from fall 2002 to fall 2010 was even higher at 18.3%, as enrollees in 2002 were only 1.6 million. In comparison, the overall higher-education student body has expanded only 3% on the average for the same period — from 16.6 million to 19.6 million. Therefore, the proportion of students taking at least one online course has been increasing as well: from less than 10% of all higher-education students in fall 2002 to 31% by the end of 2010. Private for-profit institutions appear to be leading the online learning phenomenon: from 2009 to 2011, they reported that online learning is critical for their long-term strategy 50.7%, 60.5%, and 69.1%, respectively (Allen & Seaman, 2011).

Students who participate in online education perform as well as (or even slightly better than) those in purely classroom settings. This suggests that online delivery can be an effective teaching option (Cater III, Michel, & Varela, 2012); therefore, motivating online learners must be a nonstop process of providing learning solutions associated with the use of technology. For instance, a person who chooses the online modality ought to be willing to do what his/her peers are doing and approach tasks with interest and commitment (Deci & Flaste, 1996). Thus, his/her motivation to learn derives from, among other things, the meaningful nature of these learning environments and activities (Shroff, Vogel, & Coombes, 2008).

According to Omar, Kalulu, and Alijani (2011), the need for motivation is based on the fact that institutions usually treat all students alike, and the “no significant difference” phenomenon between traditional and online students will continue. This study aims to describe how intrinsic motivation, extrinsic motivation, and amotivation influence the students’ intention to continue taking online courses as a measure of retention in two samples: fully online (OL) students and on-campus students taking one or more online courses (OCOL). This work has three sections: (1) a literature review describing the components of intrinsic motivation, extrinsic motivation, and amotivation, and how the components affect retention in online courses; (2) an explanation of the methodology used in the study; and (3) a discussion based on the findings and the conclusion.

THE STUDY

The concept of motivation refers to the desire to pursue a learning goal or carry out specific learning tasks (Deci, 1996); it plays an important role in the learning context in that it shows how students in both traditional and online learning environments are successful. In other words, motivation is an internal force that guides behaviors toward learning and/or achievement and must thus be seen as a priority in both online learning and personal environments. People are motivated by their interest in an activity, the value placed on that activity, or an external coercion (Ryan & Deci, 2000). Motivation is maximized when they expect valuable and achievable outcomes from the activity (Bandura, 1997).

Although some argue that the number comparative studies between the online and classroom delivery of instruction methods have reached saturation level (Abrami, Bernard, Bures, Borokhovski, & Tamin, 2011), there is neither an exclusive list of influential factors nor a universal model for all situations supporting individual student motivation in technology-supported environments (Saade, Tan, & Nebebe, 2008). Therefore, there is an opportunity for finding valuable information on how to improve teaching quality to satisfy a student's progress in online learning. For example, Wighting, Liu, and Rovai (2008) found that the stronger motivation of the online group represents the most important predictor in discriminating between online and traditional students. Students who elect to enroll in online courses may have already possessed a strong intrinsic motivation to learn in general, higher self-regulatory competence to accomplish their learning goals (Dabbagh & Kitsantas, 2004), a more autonomous online learning environment, and higher proficiency in technology (Qureshi, Morton, & Antonsz, 2002).

The Self-Determination Theory (SDT) is an approach used to explain students' behavior in the learning processes; it states that behaviors can be intrinsically and extrinsically motivated or amotivated (Deci & Ryan, 1985). Nevertheless, SDT has been applied to the educational context (Standage, Duda, & Ntoumanis, 2005; Niemiec et al., 2006; Cheng & Jang, 2010; Guiffrida, Lynch, Wall, & Abel, 2013), and this theory has been found to be a predictor of learning outcomes such as performance, persistence, engagement, achievement, and learning satisfaction (Deci & Ryan, 1985; Chen & Jang, 2010; Areepattamannil, Freeman, & Klinger, 2011; Guiffrida et al., 2013). The present research has selected SDT (Deci & Ryan, 1985) to support the study of motivation and its impact on retention for fully online students and on-campus students taking online courses.

Intrinsic motivation, one of the components of self-determinate behaviors, is an inclination to find satisfaction in an activity by itself, which drives individuals to explore more about the activity and learn from participating in that activity (Deci & Ryan, 2000). An individual who is intrinsically motivated participates in an activity with vigor (Saade, Tan, & Nebebe, 2008), tries to know more about it, strives to accomplish the goals, and experiences stimulation when doing the activity. Moreover, intrinsic motivation has been found to be a stronger factor than extrinsic motivation for enrolling in an online course because the students find the online environment less controlling (Rovai, Ponton, Wighting, & Baker, 2006); exhibit higher levels of interest (Stevens & Switzer, 2006), an independent learning style, and self-directed behavior; and possess an internal locus of control (Terrell & Dringus, 1999). Specifically, Guiffrida et al. (2013) found that students whose intrinsic need for autonomy and competence motivated them to attend college showed a higher grade point average (GPA) and intention to persist than other students. In addition, intrinsically motivated students develop (1) emotional strength, knowing they are not alone in the learning process, and (2) self-efficacy born of higher expectations and a heightened sense of their ability to succeed in their new learning environment (Holder, 2007).

Another kind of motivation is extrinsic motivation. According to the SDT (Deci & Ryan, 1985), some behaviors or actions are triggered by external stimuli, not by the activities themselves; they work as a means to an end and are not done for their own sake (Deci, 1975). Students can be spurred to learn by inherent and extrinsic motivation at the same time. For instance, Ballmann and Mueller (2008) found that the students' decision to attend an educational institution was influenced by both extrinsic and intrinsic motivation (to know).

Extrinsic motivation occurs when individual behavior is externally controlled by rewards and constraints. Individuals engage in an activity when (1) they feel pressured to do so by peers, the instructor, or social influencers avoiding painful consequences; (2) their behavior is triggered and controlled by external rewards, such as prizes promised by instructors or parents (Deci & Ryan, 1985a); (3) they value a behavior and perceive it as having been chosen by themselves (Vallerand et al., 1992); and (4) they do it willingly and the self-regulation is consistent with their self-concept (Deci & Ryan, 1985).

Amotivation, another component of the self-determination theory, is the absence of motivation. Individuals are amotivated when (1) they perceive a lack of contingency between their behavior and outcomes, (2) they feel incompetence and a lack of control (Deci & Ryan, 1985); and (3) they do not perceive as valuable the use of intrinsic or extrinsic rewards for participating or being engaged in an activity. Basically, individuals feel that their behaviors are caused by forces beyond their control and, undecieved (Vallerand et al., 1992), they are neither intrinsically nor extrinsically motivated. Amotivation has been found to be a relevant negative predictor of persistence in education (Deci & Ryan, 1975; Vallerand & Bissonnette, 1992).

On the other side, retention rates have been shown as a timeless concern of educational institutions since many years ago. The lack of retention and persistence, dropping out, and attrition have historically challenged

academic systems (Berge & Huang, 2004) — in both traditional and distance learning. Retention or persistence in an e-learning setting is shown by a series of student behaviors, skills, and attitudes toward continuing involvement in that learning environment in spite of obstacles (Rovai, 2002; Hart, 2012) to their goals. It is one of the most important indicators of the effectiveness (Rovai, 2002) of institutions at all educational levels. Boston, Ice, and Gibson (2001) stated that formal research concerning retention began as early as 1926 (Braxton, 2000), and academics such as Spady (1970), Astin (1993), Tinto (1975, 1993), and Braxton, Hirschy, and McClendon (2004) published influential research on student retention. There are now more studies on retention, including retention in the e-learning context.

With regard to online learning, we can add that when students have the ability to work independently, they maintain their motivation despite conflicting commitments and demonstrate computer proficiency (Holder, 2007). Furthermore, if the online structure allows students to satisfy their goals, they will have more favorable perceptions of the quality of online courses (Rodriguez, Ooms, & Montañez, 2008), which will have a positive impact on their retention. In contrast, when e-learning students are incapable of managing their time properly, prioritizing, motivating themselves to meet university academic standards, or adapting to their new communal educational environment; have financial difficulties (Omar, Kalulu, & Alijani, 2011); or perceive that online interaction with the instructor is weaker than in person, their motivation decreases (Wolcott & Burnham, 1991; Zvacek, 1991). Consequently, they fail or drop out more frequently than other students (Omar et al., 2011). In this respect, Muilenburg and Berge (2005) found that the lack of social interaction was the biggest barrier to taking another online class. This result reinforces the idea that student motivation in online courses is driven by the need to achieve personal goals and meet the expectations of their peers (Scardamalia & Bereiter, 1994).

There are different strategies to support the completion of an online course. For example, elements such as weekly e-mails, a clear schedule, flexible testing times and dates, and frequent interaction between participants and instructors decrease the sense of physical distance; these have been important factors in the high completion rates of online courses (Pittenger & Doering, 2010). Instructional design fosters a sense of confidence and satisfaction in students (Keller, 1987, 1999), and keeps them engaged by providing reliable resources that promote self-directed learning (Keller, 2006). When complemented by auxiliary instruction, instructional design mitigates the lack of confidence (Benson, 1989) by offering accessible supplemental activities that give quick learning results for minimal effort, thereby avoiding low motivation to learn and achieve.

The lack of instructor participation and clear guidelines in the online instructional design has a negative effect on motivational learning. Instructors must pay attention to the learning content itself, teaching methods/styles, their expertise in the subject matter, and types of learning activities, for instance, giving students practical work experiences to apply their learning (Noel-Levitz, 2013) — satisfying the factors that influence student motivation, as a student's perception of instructional quality is related to favorable academic outcomes (Artino, 2007). On the opposite end, the absence of the aforementioned elements cancels their positive effects on e-learners, thereby increasing the likelihood that e-learners will withdraw from the course or program, or discontinue their involvement in the learning environment (Young & Vachon, 2005).

High learning quality with an acceptable instructional design will keep students highly engaged and thus encourage them to remain in the environment. Student engagement is often a product of instructional content and quality across social interaction, which occurs, for instance, on discussion boards in online courses (DeLotell, Milliam, & Reinhardt, 2010).

The study was conducted to answer this research question: How do intrinsic motivation, extrinsic motivation, and amotivation affect the retention of students who are taking fully online and on-campus online courses? An electronic survey was designed to validate the construct motivation and retention in an online learning context, and the theory found within the research framework. The instrument was divided into three parts to provide psychological differentiation, with an introduction saying that we are examining motivational issues, without implying any link with the dependent variable, retention. The first part obtained information on the level of motivation among students taking online courses at Florida National University (FNU) during the summer semester of 2013. The motivation component was measured with the Academic Motivation Scale (AMS) developed by Vallerand et al. (1992), adapted to fit the online learning motivation from the Sport Motivation Scale version created by Pelletier, Fortier, Vallerand, Tuson, and Brière (1995), and the one adapted by Stover, De la Iglesia, Rial Boubeta, and Fernández (2012). This instrument contains one subscale each for intrinsic motivation, extrinsic motivation, and amotivation. All 28 items of the scale were grouped according to the different components of motivation as explained by Pelletier et al. (1995), and rated using a seven-point scale. The answers to the question “Why do you take online courses?” ranged from “1 - Does not correspond at all” to

“7 - Corresponds exactly.” The items offer possible answers that reflect the different types of motivation.

The second part of the questionnaire examined student retention in an online setting. After analyzing the literature, it was found that retention is measured from different perspectives: (1) attitudinal (Hallowell, 1996; Bowen & Chen, 2001), (2) behavioral (Hardre & Reeve, 2003; Liljander & Strandvik, 1994; Day, 1969), and (3) combined, which involves a psychological/attitudinal component with repeated behaviors (Oliver, 1999; Bloemer, de Ruyter & Peetersl, 1998; Al-hawari & Mouakket, 2010). In this study, retention is measured through intention, since it is appropriate for testing an individual's behavior (Ajzen & Fishbein, 1980), and this is considered the best immediate factor of the relationship between attitude and behavior (combined perspective).

Finally, five items were found to be appropriate in defining the intention to continue taking online courses from the combined perspective of retention: (1) “I intend to continue taking online courses” (behavioral component, modified for online retention from Zeithaml, Berry, and Parasuraman, 1996; Bhattacharjee, 2001; Ribbink, Van Riel, Liljander, and Streukens, 2002; Devaraj, Fan, and Kolhi, 2002; and Cyr, Head, and Ivanov, 2006); (2) “My intention is to continue taking online courses rather than using traditional courses” (behavioral component, modified for online retention from Bhattacharjee, 2001 and Devaraj et al., 2002); (3) “I will continue taking online courses even if I face problems” (behavioral component, modified for online learning from Zeithaml et al., 1996; Ribbink et al., 2002; and Cyr et al., 2006); and (4) “I recommend taking online courses” and (5) “I say positive things about online learning” (attitudinal components, modified for online retention from Zeithaml et al., 1996; Ribbink et al., 2002; and Cyr et al., 2006). The items were rated with exactly the same scale used in the 28-item AMS. The third part of the questionnaire included questions concerning demographics. (See Appendix 1)

The questionnaire was reviewed by (1) some scholars with traditional and online teaching experience to verify whether the content of the items worked appropriately within the online learning context and (2) piloted through 22 students taking a business online course at FNU that was taught by the author from the beginning of the summer semester in May 2013. Only one item — related to one of the reasons students have to take online courses (motivation) — was confusing to them. The item was reworded as “Because it is absolutely necessary to take online courses if one wants to be on top of knowledge.” (See Appendix 2).

A convenience sampling technique was used to collect data between May 2013 and August 2013 from 788 undergraduate students taking online courses (210 fully online and 577 on-campus taking online courses in the summer semester). The questionnaire was released through Google's Drive, and was sent to all students by e-mail. Of the total recipients, 198 returned the questionnaire (24.8%), all of which were encoded into an excel file and imported into SPSS v.22 and AMOS v.22. The OL and OCOL students were classified using three of the most common demographic variables, and students from both samples were primarily female, between 18 and 35 years old; the majority consisted of single students and couples with children (see Appendix 1).

After observing undesirable values of skewness and kurtosis (data compression) for each quantitative variable, the Kolmogorov-Smirnov and Shapiro-Wilk tests were performed to assess univariate normality. Both tests returned a statistically significant difference from a normal distribution. All the quantitative variables were transformed to achieve normality by using the arithmetical function of log base-10 (Log10). As a result, all variables considerably improved their normality (skewness, kurtosis values, histogram, and Q-Q plot). Two cases were eliminated due to incomplete responses, and five cases with missing values (2.56%, 5/196 cases) across all 33 continuous variables were found and assessed for possible missing data intervention. Little's MCAR test (chi-square = 203.852, df = 154, Sig = .004) showed that the data might be missing at random. Additionally, five cases (32, 55, 83, 147, and 191) were identified as potential outliers and eliminated from the analysis (with 33 degrees of freedom and Mahalanobis distance values equal to or greater than 63.87). Moreover, the homogeneity of the variance-covariance matrices was measured with Box's test and was statistically significant ($F = 1.565$, $p < .001$), suggesting that there was no equality of variance-covariance matrices. In the end, the sample was down to 191 students (95 OL and 96 OCOL) out of 788, representing 24, 2%.

An exploratory factor analysis of the 33 variables (28 variables for intrinsic motivation, extrinsic motivation, and amotivation; and five variables for retention) was conducted on the data of the 191 students. The varimax extract rotation method yielded a Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy of 0.954; Bartlett's test of sphericity indicated significance ($p < 0.001$, with chi-square = 5301.997, df = 378). Three factors showed eigenvalues greater than 1.00 (71.133% of the total variance). By analyzing the content of each factor, the 28 items were grouped under intrinsic motivation (18), extrinsic motivation (6), and amotivation (4). Each subscale of motivation was assessed for consistency by Cronbach's alpha coefficients, resulting in adequate alpha ratios

(intrinsic motivation $\alpha = 0.97$, $p < 0.001$; extrinsic motivation $\alpha = 0.89$, $p < 0.001$; and amotivation $\alpha = 0.85$, $p < 0.001$). The same analysis was performed on the five-item retention scale, which yielded a KMO measure of 0.856; a significant Bartlett's test of $p < 0.001$ (chi-square = 773.023, $df = 10$); an *one* factor greater than 1.00 (3.851; 77.026% of explained variance) and alpha coefficient $\alpha = 0.92$, $p < 0.01$. The KMO measure and Bartlett's test for both motivation and retention scales produced reliable results, indicating that the data had sufficient correlation between variables and was, therefore, suitable for principal components analysis. The alpha coefficients for each subscale of the motivation and retention scale were above 0.70, indicating high reliability (Nunnally, 1978).

After applying an exploratory factor analysis and obtaining three factors for motivation and one for retention, a confirmatory factor analysis was conducted to determine whether the hypothesized factors with their associated indicator variables fit the data (evidence of validity). The original model offered the following indexes: chi-square = 217.658, $df = 165$, $p < .001$ GFI = .72, NFI = .82, CFI = .88, and RMSEA = .097. The model did not fit the indexes for GFI, NFI, and CFI; but, the RMSEA was acceptable. A review of the modification indexes led to respecifying the model by the variables of the latent factors. The process of respecifying the model suggested the elimination of some variables of the latent factors intrinsic motivation, extrinsic motivation, and amotivation to have a better model fit. The results of the respecified model achieved a significant chi-square of 276.296, $df = 167$, $p < .001$ and higher values for the indexes: GFI = .90, NFI = .937, RFI = .921, CFI = .974, RMSEA = .050, PCLOSE = .122 (see Table 1).

Table 1: Indexes obtained after respecifying the model

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	64	276.296	167	.000	1.654
Saturated model	231	.000	0		
Independence model	21	4417.806	210	.000	21.037
Model	RMR	GFI	AGFI	PGFI	
Default model	.005	.90	.836	.637	
Saturated model	.000	1.000			
Independence model	.054	.135	.048	.122	
Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.937	.921	.974	.967	.974
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000
Model	RMSEA	LO 90	HI 90	PCLOSE	
Default model	.050	.046	.071	.122	
Independence model	.325	.316	.333	.000	

Since the main purpose of this research is to determine the impact of motivation on retention for both OL and OCOL students, it was important to know whether the model can be applied equally well to data obtained from two or more different groups. The Model Invariance Assessment evaluated the difference between unconstrained and constrained models (model comparisons), which assumes that the groups are not yielding different values of the parameters when the model is applied to the data (Meyers et al., 2013). The key results of the nested model comparisons were evaluated by a chi-square test (CMIN) (see Table 2). All the comparisons yielded statistically significant results; therefore, the correlation or variances of the variables differ between the groups, and the research question will be explained for each group separately. The comparisons between online and on-campus students' motivation-retention relationships on path coefficients and correlations are shown in Appendix 3 and the path variance models in Figures 1 and 2.

Table 2: Nested Model Comparisons (Assuming model Unconstrained to be correct)

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement weights	17	28.816	.036	.006	.007	.000	.000
Measurement intercepts	38	84.327	.000	.018	.019	.005	.006
Structural weights	41	94.334	.000	.020	.021	.006	.007
Structural covariances	47	101.741	.000	.021	.023	.006	.006
Structural residuals	48	102.012	.000	.021	.023	.005	.006
Measurement residuals	85	227.607	.000	.048	.051	.018	.020

FINDINGS

Intrinsic Motivation, Extrinsic Motivation, Amotivation, and Retention for OL and OCOL Students

The results of the study indicated different mean values of intrinsic and extrinsic motivation, amotivation, and retention for OL and OCOL students (see Table 3). The mean of each latent variable showed that intrinsic motivation (OL: 4.42 and OCOL: 4.23) had the highest score, followed by extrinsic motivation (OL: 3.1 and OCOL: 2.99) and amotivation (OL: 2.02 and OCOL: 3.00). All results from the mean of each variable offered low/intermediate values from a seven-point scale. The intention to continue online courses (retention) of OL students was 6.06 and for OCOL, 4.00.

An analysis of mean comparison — by applying *Levene's test* to all latent variables — showed nonsignificant differences between OL and OCOL students in the intrinsic motivation variables. For extrinsic motivation, two out of three internal variables yielded nonsignificant differences, although the variable “To show others how good I am at my online learning” did show an important difference between OL and OCOL students. For the latent variable retention, the analysis offered significant differences between the two samples for each retention internal variable (see Table 3); therefore, the intrinsic motivation variable (var22) and retention can be treated as perceived differently by OL and OCOL students, which supports the idea of analyzing both samples separately, as indicated by the invariant assessment previously performed.

Table 3: Mean comparison for motivation and retention variables.

Variables	Online (n=95)		On-campus (n=96)		Levene's test for equality of variances	
	Mean	Std. Deviation	Mean	Std. Deviation	F value	Sig.
V4	4.67	2.25	4.66	2.24	0	0.97
V13	4.49	2.22	4.27	2.25	0.9	0.34
V27	4.47	2.34	4.47	2.14	1.07	0.3
V17	4.62	2.37	4.71	2.21	1.71	0.19
V8	4.48	2.31	4.39	2.15	0.29	0.59
V15	4.47	2.3	4.28	2.31	1.37	0.24
V20	4.37	2.32	4.11	2.19	0.01	0.93
V12	4.54	2.14	4.13	2.2	2.15	0.14
V23	4.16	2.4	4.04	2.25	0.56	0.45
V11	4.75	2.2	4.22	2.18	1.2	0.28
V18	3.97	2.48	3.78	2.16	2.09	0.15
V25	4.11	2.41	3.73	2.17	0.15	0.7
Intrinsic Motivation	4.43		4.23			
V24	2.66	2.18	2.66	1.91	0.17	0.68
V22	3.36	2.49	3.26	2.13	5.26	0.02
V14	3.28	2.4	3.07	2.17	0.61	0.44
Extrinsic Motivation	3.1		3			
V19	2.06	1.88	3.27	2.28	11.91	0.00
V5	1.99	1.91	2.73	2.19	7.82	0.01
Amotivation	2.03		3			
V29	6.23	1.61	4.84	2.14	18.01	0.00
V30	5.84	1.87	3.92	2.13	17.18	0.00
V32	6.05	1.65	5.04	2.1	12.33	0.00
V33	6.14	1.5	5.4	1.86	7.16	0.01
Retention	6.07		4.8			

As mentioned above, internal variables/items of intrinsic motivation for both the fully online and on-campus students displayed high correlation coefficients with their latent variable, intrinsic motivation, but their means did not show statistically significant differences between the two kinds of students. The arguments that tend to be intrinsically motivated (see Figures 1 and 2) are the excitement the students feel when they are involved in the learning activity (var13, var25); the pleasure of discovering new learning strategies and study techniques (var27, var4); and the pleasure in performing certain difficult assignments that help improve some weak points and develop other aspects of themselves by using online techniques they never tried before (var11, var12, var20,

var23). The students feel intense emotions while taking the online course they like (var18), recognizing that online learning is a good way to learn several useful things in other areas of their life (var17). Therefore, they feel personal satisfaction while mastering certain difficult online learning challenges and perfecting their abilities (var8, var15).

Table 3 shows the arguments on being extrinsically motivated to take online courses. Two items were similar for OL and OCOL students and one, different. In this respect, the students recognize that online learning is an effective way of maintaining sound relationships with friends (var24) and making them feel good about themselves (var14). However, OL students have a stronger perception that the online environment is a venue where they can show off how good they are at online learning (var22).

Amotivation, the third motivational component, appears in the absence of motivation. Despite being intrinsically or extrinsically motivated, both OCOL and OL students recognize some amotivation factors resulting from negative or frustrating thoughts — when their outcomes do not match expectations or when they have personal/professional issues. Concretely, their amotivation is manifested by the uncertainty that their place is really in online learning (var19) and sometimes, the impression that they are incapable of succeeding in their online course (var5). These two factors are stronger in OCOL students.

The following results describe how each component of motivation impacted the dependent variable, retention, for both OL and OCOL students.

Predicting Retention from Motivation of OL and OCOL Students

In order to address the research question, the prediction validity of intrinsic motivation, extrinsic motivation, and amotivation on retention was developed through structural equation modeling (AMOS v.22). As mentioned in the data analysis section, it was necessary to know whether the model could be applied equally well (invariant across the groups) to data obtained from two different groups (online students and on-campus students taking online courses). The correlation or variances of the variables between the groups were found to differ, and we concluded that the research question will be explained separately for each group. Path analyses were performed on the OL and OCOL groups. In both samples, overall retention (measured by the intention to continue taking online courses) was the dependent variable and the three components of motivation — intrinsic, extrinsic, and amotivation — the independent variables.

For the OL students (see Figure 1), all the intrinsic motivation variables show a high correlation with the latent variable, retention. There is a positive correlation between intrinsic and extrinsic motivation and retention ($r = .43$ and $r = .33$, respectively). A negative correlation exists between amotivation and retention ($r = -.58$). In this case, we found that an increment in either intrinsic or extrinsic motivation led to higher retention in the online setting. The negative impact of amotivation on retention is the highest correlation found, so that the higher the amotivation in students to take online courses, the lower their intention to take them in the future.

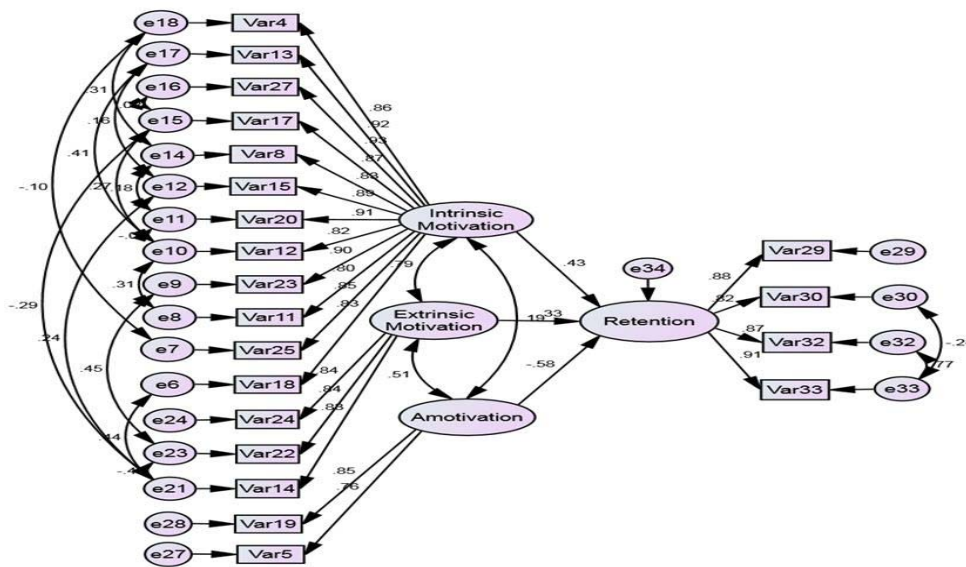


Figure 1: The Path variance Model for retention in online courses for *online students (OL)*.

The correlations between the components of motivation and retention of the OCOL students (Figure 2) behaved similarly to those of the OL students. Intrinsic and extrinsic motivation impacted positively on retention ($r = .35$ and $r = .27$, respectively) and amotivation, negatively ($r = -.59$). Intrinsic and extrinsic motivation trigger higher retention among OCOL students, and the higher the amotivation, the lower their intention to continue taking online courses. Note that there is a statistically significant difference between OL and OCOL students with regard to amotivation and retention; the negative impact of amotivation on retention is stronger among the on-campus students.

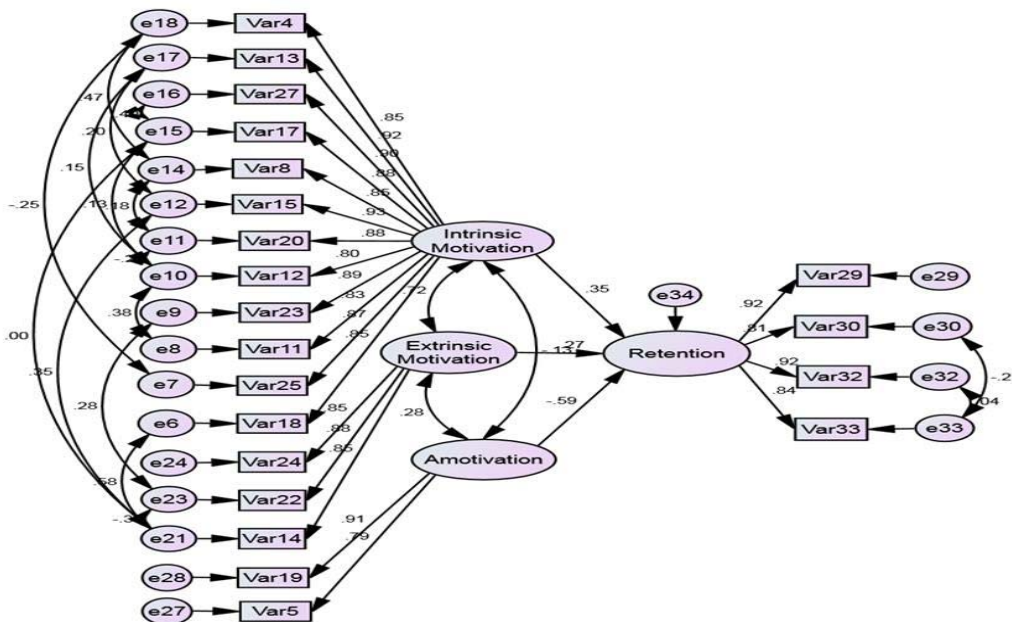


Figure 2: The Path variance Model for retention in online courses for *on-campus students taking online courses (OCOL)*

DISCUSSION

The path coefficients from the intrinsic motivation, extrinsic motivation, and amotivation components that were tested proved to be important predictors of retention in online courses; this result was also obtained in prior studies (Saade, Tan, & Nebebe, 2008; Areepattamannil & Freeman, 2011; Guiffrida et al., 2013). The use of structural equation modeling tools identified differences in amotivation and retention between fully OL and OCOL students; however, no differences in intrinsic and extrinsic motivation occurred between the groups.

The study found that fully OL students had high intrinsic motivation for taking online courses. OCOL students, despite being reluctant by nature to take online courses, showed similar levels of intrinsic motivation. Thus far, the students' intrinsic motivation had been based mainly upon the pleasure of discovering and using new study techniques, learning strategies that they had never tried before, and the pleasure felt while performing difficult assignments. Moreover, Deci and Ryan (2000) found that students were intrinsically motivated by the excitement and intense emotions they experienced while being involved in the course they liked and the satisfaction of perfecting their abilities through the online environment. This study reveals that intrinsic motivation is a stronger factor than extrinsic motivation for enrolling in an online course; as similarly observed by Rovai et al. (2006).

With regard to extrinsic motivation, the students said that online learning is another platform on which to reinforce peer relationships and avoid losing them (Deci & Ryan, 2000; Vansteenkiste & Lens, 2006). It was also found that when students showed how good they were at online learning (one of the components of extrinsic motivation, the results of which produced differences in both samples), they positively affected the others' intention to continue taking online courses. Since online learning is more challenging than traditional learning because individuals must have a higher self-deterministic attitude, online students, in this study, perceive that they will receive recognition from peers or relatives when they make a great effort, which reinforces their resolve to pursue their academic goals.

Regardless of whether they are intrinsically or extrinsically motivated, OL and OCOL students reveal some amotivation for online learning. Evidence of amotivation is their (1) being unconvinced that their place is in online learning and (2) permanent impression that they are incapable of succeeding in online learning. In this respect, individuals could not sustain their levels of intrinsic and/or extrinsic motivation, and they sometimes experienced a lack of interest or frustrating thoughts about online learning. This could affect their performance and outcomes in the course; therefore, they are more often susceptible to amotivation. This study reveals that these beliefs can have a high and relevant negative impact on the intention to continue taking online courses, and they are stronger among OCOL students. This prediction corroborates what Deci and Ryan (1975), and afterward, Vallerand and Bissonnette (1992), found pertaining to amotivation and persistence in online learning.

Retention, measured by the intention to continue taking online courses, was finally defined by four items. As said above, the results showed differences between the two groups of students regarding their intention to continue taking online courses. OL students clearly have the persistence to continue taking online courses. As expected, OCOL students also showed a positive predisposition to take online courses in the future, but at a lower level than their fully OL counterparts. The lower intention demonstrated by OCOL students could be attributed to external factors that lead them to opt for online alternatives instead of going fully online. Fully OL students are more eager to recommend online classes to friends and peers, and say positive things about online learning. It seems that the disposition of OCOL students to encourage others to use the online platform for learning is influenced more by the experiences and outcomes they obtain at finishing their courses than the fact of being an online learner. The results are in synchrony with the conclusions obtained by Guiffrida et al. (2013), who found that students who were motivated to attend college to fulfill intrinsic needs for autonomy and competence showed a higher GPA and intention to persist than students who were less motivated to attend for these reasons.

After making efforts for keeping severity from the beginning in the study some limitations were inevitable. First, the results lack generalizability across the United States since this study was conducted only on a sample of students at FNU. Second, the exploratory factor analysis yielded general components of motivation and did not allow the identification of subcomponents for intrinsic and extrinsic motivation, which was offered by the original AMS scale used in previous studies. Third, although some demographic variables were used to describe the samples, they were not used to produce deeper conclusions.

This study recommends the continuing analysis of traditional students who combine on-campus and online courses, as they seem to have the potential to improve learning outcomes once their intrinsic and extrinsic

motivation for online learning is boosted by good instructional design. Future studies can focus on exploring the impact of motivation on retention, moderated by demographic variables, mainly for on-campus students taking online courses. Finally, as stated by Thorndike (2005), the survey used in this study has a social desirability bias and the response sets are considered significant threats to the construct validity. Therefore, the direct behavioral measures to be used in future studies will help explain how motivation influences retention (Artino, 2007).

CONCLUSION

Despite the resistance of some students to take fully online courses, economics and social factors nowadays force some of them to find alternative ways of learning to achieve their personal and professional goals. Many would rather take online classes, even when this option does not favor them totally. Conversely, other students combine traditional and online learning to pursue their academic degrees.

The main objective of this research was to study the impact of motivation on retention of the students. The lack of motivation (amotivation) has been found to be an important reason for dropping out from online courses over the past years (Ryan & Deci, 2000; Saade et al., 2008; Wighting et al., 2008; Cheng & Jang, 2010; Guiffrida et al., 2013). Moreover, motivation has a significant impact on academic achievement (Areepattamannil et al., 2011).

This particular research concentrated on two groups: fully online students and on-campus students taking online courses. The second group, being a combination of traditional and online students, had not yet been targeted by researchers. This study provides empirical evidence of the positive impact of intrinsic and extrinsic motivation, and the negative influence of amotivation on the retention in online learning of both fully OL students and OCOL students. The negative impact of amotivation is stronger on OCOL students. This research reinforced the findings of Wighting, Liu, & Rovai (2008) that intrinsic motivation is difficult to separate from extrinsic motivation. Despite the fact that most of the extrinsic reasons to take online courses had a similar influence on both kinds of students, there was a difference as regards one element of extrinsic motivation (“to show others how good I am at my online learning”).

The above conclusion suggested that the key variables used to investigate motivation and retention in this study may be similarly or differently relevant across students' enrollment status in online courses; they may open new avenues for improving the teaching-learning quality in the online setting. In this respect, online instructors should profile the basis of enrollment. The classification of students in an online course as either fully OL or OCOL will allow instructors to take into account in their lessons, exercises, extra work, and feedback the OCOL students who have a lower academic performance. Holder (2007) stated that online students show a strong sense of their own personal ability to succeed in their new learning environment. However, in this study, this was an amotivational ingredient for both OL and OCOL students. Mainly, OCOL students displayed sensitivity to the impression they were incapable of succeeding in online learning, which impacted negatively on retention. Therefore, instructors should put special emphasis on converting such pessimism into a willingness to continue, using the online platform to learn through more interaction.

REFERENCES

- Abrami, P. C., Bernard, R. M., Bures, E. M., Borokhovski, E., & Tamin, R. M. (2011). Interaction in distance education and online learning: Using evidence and theory to improve practice. *Journal of Computing and Higher Education*, 23, 82-103.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. NJ: Prentice-Hall, Englewood Cliffs.
- Al-hawari, M., and Mouakket, S. (2010). The influence of technology factors on students' e-satisfaction and e-retention within the context of UAE e-learning, *Education Business and Society: Contemporary Middle Eastern Issues*, 3(4), 299-314.
- Allen, I. E., & Seaman, J. (2011). Retrieved July 20, 2013, from http://www.sloanconsortium.org/publications/survey/going_distance_2011.
- Areepattamannil, S., Freeman, J.G., and Klinger, D. A. (2011). Intrinsic motivation, extrinsic motivation, and academic achievement among Indian adolescents in Canada and India. *Soc Psycho Educ*, 14, 427-439.
- Artino, A. R. (2007). Motivational beliefs and perceptions of instructional quality: predicting satisfaction with online training. *Journal of Computer Assisted Learning*, 24, 260-270.
- Astin, A. W. (1993). *What matters in college: Four critical years revisited*. San Francisco, CA: Jossey-Bass.
- Ballmann, J. M., & Mueller, J. J. (2008). Using self-determination theory to describe the academic motivation of allied health professional-level college students. *Journal of Allied Health*, 37(2), Summer, 90-96.

- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Bhattacharjee, A. (2001). Understanding information systems continuance: An exploration-confirmation model. *MIS Quarterly*, 25(3), 351-370.
- Beaudin, B. P. (1999). Keeping online asynchronous discussions on topic. *Journal of Asynchronous Learning Networks*, 3(2), 41-53.
- Benson, J. (1989). Structural components of statistical test anxiety in adults: An exploratory model. *Journal of Experimental Education*, 57(3), 247-261.
- Berge, Z. L., & Huang, Y. P. (2004). A model for sustainable student retention: A holistic perspective on the student dropout problem with special attention to E-learning. *DEOSNEWS*, 13(5), (Retrieved February 8, 2013 from http://ed.psu.edu/acsde/deos/deosnews/deosnews13_5.pdf).
- Bird, J., & Morgan, C. (2003). Adults contemplating university study at a distance: Issues, themes, and concerns. *International Review of Research in Open and Distance Learning*, 4(1) (Retrieved February 8, 2013, from http://www.irrodl.org/content/v4/bird_morgan.html).
- Boston, W. E., Ice, P., & Gibson, A. M. (2001). Comprehensive assessment of student retention in online learning environments. *Online Journal of Distance Learning Administration*, IV(1). Spring.
- Bowen, J., & Chen, S. (2001). The relationship between customer loyalty and customer satisfaction. *International Journal of Contemporary Hospitality Management*, 13(5), 213-217.
- Bloemer, J., deRuyter, K., & Peeters, P. (1998). Investigating drivers of bank loyalty: the complex relationship between image, service quality and satisfaction. *International Journal of Bank Marketing*, 16(7), 276-286.
- Braxton, J. M., Milem, J. F., & Sullivan, A. S. (2000). The influence of active learning on the college student departure process: Toward a revision of Tinto's theory. *Journal of Higher Education*, 75, 569-590.
- Braxton, J. M., Hirschy, A. S., & McCledon, S. A. (2004). Understanding and reducing college student departure. *ASHE-ERIC Higher Education Report*, 30(3). SF: Jossey-Bass.
- Byrne, B.M. (2001). *Structural Equation Modeling with Amos. Basic concepts, applications, and programming*. NJ: Lawrence Erlbaum Associates, Inc.
- Cater III, J. J., Michel, N., & Varela, O. E. (2012). Challenges of online learning in management education: An empirical study. *The Journal of Applied Management and Entrepreneurship*, 17(4), 76-96.
- Cheng, K., & Jang, S. (2010). Motivation in online learning: Testing a model of self-determination theory. *Computers in Human Behaviors*, 26, 741-752.
- Cokley, K. O., Bernard, N., Cunningham, D., & Motoike, J. (2001). A psychometric investigation of the Academic Motivation Scale using a United States sample. *Measurement and evaluation in Counseling and development*, 34(2), 109-119.
- Cyr D., Head, M., & Ivanov, A. (2006). Design aesthetics leading to m-loyalty in mobile commerce. *Information and Management*, 43(8), 950-963.
- Dabbagh, N. & Kitsantas, A. (2004). Supporting self-regulation in student-centered web-based learning environments. *International Journal on E-learning*, 3(1), 40-47.
- Day, G. (1969). A two-dimensional concept of brand loyalty. *Journal of advertising Research*, 9(3), 29-35.
- Deci, E.L. (1975). *Intrinsic Motivation*. NY: Plenum.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behaviors*, NY: Plenum.
- Deci, E. L., & Flaste, R. (1996). *Why we do what we do: Understanding self-motivation*, NY: Penguin.
- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11, 227-268.
- DeLotell, P. J., Milliam, L. A., & Reinhardt, M. M. (2010). The use of deep learning strategies in online business course to impact student retention. *American Journal of Business Education*, 3(12), December.
- DeShields Jr, O.W., Kara, A., and Kaynak, E. (2005). Determinants of business student satisfaction and retention in higher education: applying
- Devaraj, S., Fan, M., & Kolhi, R. (2002). Antecedents of B2B channel satisfaction and preference: validating e-commerce metrics. *Information Systems Research*, 13(3), 316-333.
- Diaz, D. P. (2000). *Comparison of student characteristics, and evaluation of student success, in an online health education course*. Ed.D. dissertation, Nova Southeastern University.
- Diaz, D., & Carnal, R. 2006. Term length as an indicator of attrition in online learning. *Innovate*, 2(5). Retrieved March 15, 2013 from <http://innovateonline.info/Index.php?view=article&id=196>.
- Fairchild, A.J., Horst, S.J., Barron, K.E. (2005). Evaluating existing and new validity evidence for the Academic Motivation Scale. *Contemp Educ Psychol.*, 30(3), 331-358.
- Herzberg's two factor theory, *International Journal of Educational Management*, 19(2/3).

- Guiffrida, D.A.; Lynch, M.F.; Wall, A.F.; & Abel, D.S. (2013). Do reasons for attending college affect academic outcomes? A test of a motivational model from a self-determination theory perspective. *Journal of College Student Development*, 54(2), March/April.
- Hardre, P. L., & Reeve, J. (2003). A motivational model of rural students' intentions to persist in, versus drop out of, high school. *Journal of Educational Psychology*, 95, 347-356.
- Hardy, D. W., & Boaz, M.H. (1997). Learner development: Beyond the technology. In T. E. Cyrs (Eds.), *Teaching and learning at a distance: What it takes to effectively design, deliver, and evaluate programs*, (pp. 41-48). SF: Jossey-Bass.
- Hart, C. (2012). Factors associated with student persistence in an online program of study: A review of the literature. *Journal of Interactive Online Learning*, 11(1), Spring, 19-42.
- Hallowell, R. (1996). The relationships of customer satisfaction, customer loyalty, and profitability: an empirical study. *International Journal of Service Industry Management*, 7(4), 27-42.
- Hegarty, N. (2010). Application of the Academic Motivation Scale to graduate school students. *The Journal of Human Resource and adult learning*, 6(2), December.
- Holder, B. (2007). An investigation of hope, academics, environment, and motivation as predictors of persistence in higher education online programs. *Internet and Higher Education*, 10, 245-260.
- Jones, B. D. (2010). An examination of motivation model components in face-to-face and online instruction. *Electronic Journal of Research in Educational Psychology*, 8(3), 915-944.
- Karaguvan, M. H. (2012). The adaptation of academic motivation scale to Turkish. *Educational Sciences: Theory & Practice*, 12(4), 2611-2618.
- Keller, J. M. (1987). Development and use of the ARCS model of motivational design. *Journal of Instructional Development*, 10(3), 2-10.
- Keller, J. M. (1999). Motivation in cyber learning environments. *International Journal of Educational Technology*, 1(1), 7-30.
- Leidner, D. E., & Jarvenpaa, S. L. (1995). The use of information technology to enhance management school education: A theoretical review. *MIS Quarterly*, 19(3), 265-291.
- Liljander, V., & Strandvik, T. (1994). The relation between service quality, satisfaction and intentions, in Kunst, P. & Lemmink, J. (Eds), *Quality Management in Service II*, Van Gorcum, Assen.
- Martens, R., Gulikers, J., & Bastiaens, T. (2004). The impact of intrinsic motivation on e-learning in authentic computer tasks. *Journal of Computer Assisted Learning*, 20, 368-376.
- Martin-Albo, J., Nunez, J.L.; & Navarro, J.G. (2009). Validation of th Spanish version of the situational motivation scale (EMSII) in the educational context. *The Spanish Journal of Psychology*, 29(2), 799-807.
- Muilenburg, L. Y., & Berge, Z.L. (2005). Student barriers to online learning: A factor analytic study, *Distance Education*, 26(1), 29-48.
- Niemiec, C. P., Lynch, M. F., Vansteenkiste, M., & Bernstein, J.; et al. (2006). The antecedents and consequences of autonomous self-regulation for college: A self-determination theory perspective on socialization. *Journal of Adolescence* 29(5), 761.
- Noel-Levitz (2013). 2013 student retention and college completion practices report for four-year and two-year institutions. Coralville, Iowa: Noel-Levitz. Retrieved from www.noellevitz.com/BenchmarkReports.
- Nunnally, J. C. (1978). *Psychometric Theory*, 2nd ed., NY: McGraw-Hill.
- Oliver, R. (1999). Whence consumer loyalty. *Journal of Marketing*, 63, 33-44.
- Omar, A., Kalulu, D., & Alijani, G. S. (2011). Management of innovative e-learning environments. *Academy of Educational Leadership Journal*, 15(3), 37-64.
- Pelletier, J.G., Fortier, M. S., Vallerand, R. J., Tuson, K. M., & Briere, N. M. (1995), Toward a new measure of intrinsic motivation, extrinsic motivation, and amotivation in sports: the Sport Motivation Scale (SMS). *Journal of Sport & Exercise Psychology*, 17, 35-45.
- Pittenger, A., & Doering, A. (2010). Influence of motivational design of completion rates in online self-study pharmacy-content courses. *Distance Education*, 31(3), 275-293.
- Powell, R., Conway, C., & Ross, L. (1990). Effects of student predisposing characteristics on student success. *Journal of Distance Education*, 5(1), 47-41.
- Qureshi, E., Morton, L. L., & Antonsz, E. (2002). An interesting profile –University students who take distance education show weaker motivation than on-campus student. *Online Journal of Distance Education*, 5, 90-100.
- Ribbink, D., Van Riel, A. C. R., Liljander, V., & Streukens, S. (2002). Comfort your online customer: quality, trust and loyalty on the internet. *Managing Service Quality*, 14(6), 446-456.
- Rodriguez, M. C., Ooms, A., & Montanez, M. (2008). Students' perceptions of online-learning quality given comfort, motivation, satisfaction, and experience. *Journal of Interactive Online Learning*, 7(2), Summer, 105-125.

- Rovai, A. P., Ponton, M. K., Wighting, M. J., & Baker, A. D. (2007). A comparative analysis of student motivation in traditional classroom and e-learning courses. *International Journal on E-learning*, 6(3), 413-432.
- Ryan, R. M. (1982). Control and information in the interpersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, 43, 450-461.
- Saade, R. G., Tan, W., & Nebebe, F. (2008). Impact of motivation on intentions online learning: Canada vs China. *Issues In Informing Science and Information Technology*, 5, 137-147.
- Scardamalia, M. & Bereiter, C. (1994). Computer support for knowledge-building communities. *The Journal of the Learning Sciences*, 3(3), 265-285.
- Shroff, R. H., Vogel, D. R., & Coombes, J. (2008). Assessing individual-level factors supporting student intrinsic motivation in online discussions: A qualitative study. *Journal of Information Systems Education*, 19(1), 111-126.
- Spady, W. (1970). Dropouts from higher education: An interdisciplinary review and synthesis. *Interchange*, 1, 64-65.
- Stover, J. B., De la Iglesia, G., Rial Boubeta, A., Fernandez, M. (2012). Academic Motivation Scale: adaptation and psychometric analyses for high school and college students. *Psychology Research and Behavior Management*, 5, 71-83.
- Stevens, T., & Switzer, C. (2006). Differences between online and traditional students: A study of motivational orientation, self-efficacy, and attitudes. *Turkish Online Journal of Distance Education*, 7(2), 90-100.
- Taghipour, H. A., Shahram, G., Jalali, M., Azizipour, H., Razaz Razagui, S. J., Javad Mousavian, S. (2012). Standarizing of Academic Motivation Scale. *Journal of Basic and Applied Scientific Research*, 2(2), 1186-1192.
- Terrell, S., & Dringus, L. (1999). An investigation of the effect of learning style on student success in an online learning environment. *Journal of Educational Technology Systems*, 28(3), 231-238.
- Tinto, V. (1975). Dropout from higher education: a theoretical synthesis of recent research. *Review of Educational Research*, 45, 89-125.
- Vansteenkiste, M., & Lens, W. (2006). Intrinsic versus extrinsic: Goal contents in self-determination theory: Another look at the quality of academic motivation. *Educational Psychologist*, 41, 19-31.
- Vallerand, R. J., Pelletier, L. G., Blais, M. R., Briere, N. M., Senecal, C., & Vallieres, E. F. (1992). The Academic Motivation Scale: A measure of intrinsic, extrinsic, and amotivation in education. *Educational and Psychological Measurement*, 52, 1003-1017.
- Vallerand, R. & Bissonnette, R. (1992). Intrinsic, extrinsic, and amotivational styles as predictors of behavior: A prospective study, *Journal of Personality*, 60(3), 559-620.
- Wighting, M. J., Liu, J., & Rovai, A. P. (2008). Distinguishing sense of community and motivation characteristics between online and traditional college students. *The Quarterly review of Distance Education*, 9(3), 285-295.
- Youn, S., & Vachon, M. (2005). An investigation of the profiles of satisfying and dissatisfying factors in e-learning. *Performance Improvement Quality*, 18(2), 97-113.
- Zeithaml, V., Berry, L., & Parasuraman, A. (1996). The behavioral consequences of service quality, *Journal of Marketing*, 60(2), 31-46.
- Zimmerman, B. J. (2002). Becoming s self-regulated learner: An overview. *Theory into Practice*, 41(2), 64-70.
- Zvacek, S. M. (1991). Effective affective design for distance education. *TechTrends* 36(1), 40-43

Appendix 1: Demographic characteristics

Demographics	Student Groups			
	Online		On-campus	
	Frequency	Percentage	Frequency	Percentage
Gender				
Female	73	76.8	67	69.8
Male	22	23.2	29	30.2
Total	95	100	96	100.0
Age				
18-25	22	23.2	45	47
26-35	37	38.9	31	32.3
36-45	27	28.4	14	14.5
46-55	8	8.4	6	6.2
56-65	1	1.1		
Total	95	100.0	96	100.0
Family Structure				
Single	20	21.1	40	41.7
Single with children	24	25.3	23	24.0
Couple with children	34	35.8	23	24.0
Couple without children	17	17.9	10	10.4
Total	95	100.0	96	100.0

Appendix 2: Motivation Rotated Component Matrix^a

Questionnaire	Component			Motivation Latent factors
	1	2	3	
For the pleasure of discovering new study technique (Var4)	.879	.186	.004	Intrinsic Motivation
For the excitement I feel when I am really involved in the learning activity (Var13)	.867	.314	-.002	
For the pleasure of discovering new learning strategies (Var27)	.848	.324	.040	
Because it is a good way to learn lots of things which could be useful to me in other areas of my life (Var17)	.845	.265	.060	
Because I feel a lot of personal satisfaction while mastering certain difficult online learning challenges (Var8)	.843	.231	-.010	
For the satisfaction I experience while I am perfecting my abilities (Var15)	.835	.348	.027	
<i>For the pleasure it gives me to know more about the subject that I learn (Var2)*</i>	.821	.168	.084	
For the pleasure that I feel while performing certain difficult assignments (Var20)	.814	.368	.041	
For the pleasure I feel while improving some of my weak points (Var12)	.813	.246	.012	
For the pleasure that I feel while using online techniques that I have never tried before (Var23)	.763	.481	.048	
Because it is one of the best ways I have chosen to develop other aspects of myself (Var11)	.754	.359	-.019	
For the intense emotions that I feel while I am taking my online course that I like (Var18)	.719	.468	.163	
Because I like the feeling of being totally immersed in the online learning activity (Var25)	.712	.484	.064	
<i>Because it is absolutely necessary to take online courses if one wants to be knowledgeable (Var9)*</i>	.672	.177	.258	
<i>For the pleasure I feel in living exciting experiences (Var1)*</i>	.641	.405	.186	
<i>For the prestige of being an online student (Var10)*</i>	.578	.565	.233	
<i>Because I would feel bad if I was not taking time to do it (Var21)*</i>	.523	.372	.260	
<i>Because it allows me to be well regarded by people that I know (Var6)*</i>	.512	.478	.359	

Because it is one of the best ways to maintain good relationships with my friends (Var24)	.285	.759	.373	Extrinsic Motivation
To show others how good I am at my online learning (Var22)	.414	.714	.250	
<i>Because, in my opinion, it is another way of meeting people (Var7)*</i>	.362	.672	.320	
Because I must take online courses to feel about myself (Var14)	.399	.646	.398	
<i>Because I must take online courses regularly (Var26)*</i>	.309	.629	-.144	
<i>Because people around me think it is important to be updated regarding learning supported by technology (Var16)*</i>	.464	.559	.294	
It is not clear to me anymore; I don't really think my place is in online learning (Var19)	-.090	.056	.874	Amotivation
I don't know anymore; I have the impression that I am incapable of succeeding in this course (Var5)	-.051	.131	.830	
<i>I used to have good reasons for taking online courses, but now I am asking myself if I should continue doing it (Var3)*</i>	.093	.101	.769	
<i>I often ask myself; I can't seem to achieve the goals that I set for myself (Var28)*</i>	.142	.281	.751	
I recommend taking online courses (Var32)		.921		Retention**
I intend to continue taking online courses (Var29)		.904		
My intention is to continue taking online courses rather than using traditional courses (Var30)		.872		
I say positive things about online learning (Var33)		.859		
<i>I will continue taking online courses even if I face problems (Var31)</i>		.829		

*Items eliminated from the analysis after applying confirmatory factor analysis (Items Total = 21)

**Extraction Method: Principal Component Analysis: 1 component extracted.

Appendix 3: Regression Weights: (Online – Unconstrained)

3.1: Regression Weights: (Online - Structural weights)

	Estimate	S.E.	C.R.	P
Retention <-- Amotivation	-.542	.080	-6.754	**
Retention <-- Intrinsic_Motivation	.320	.089	3.595	**
Retention <-- Extrinsic_Motivation	.243	.091	2.461	.014

3.2: Standardized Regression Weights: (Online - Structural weights)

	Estimate
Retention <--- Amotivation	-.578
Retention <--- Intrinsic_Motivation	.425
Retention <--- Extrinsic_Motivation	.333

3.3: Covariances: (Online - Structural weights)

	Estimate	S.E.	C.R.	P
Amotivation <--> Intrinsic_Motivation	.012	.007	1.598	.110
Intrinsic_Motivation <--> Extrinsic_Motivation	.064	.012	5.317	**
Amotivation <--> Extrinsic_Motivation	.033	.009	3.805	**

3.4: Correlations: (Online - Structural weights)

	Estimate
Amotivation <--> Intrinsic_Motivation	.189
Intrinsic_Motivation <--> Extrinsic_Motivation	.792
Amotivation <--> Extrinsic_Motivation	.512

3.5: Variances: (Online - Structural weights)

	Estimate	S.E.	C.R.	P
Intrinsic_Motivation	.079	.014	5.720	**
Extrinsic_Motivation	.084	.015	5.549	**
Amotivation	.051	.011	4.641	**

3.6: Regression Weights: (On Campus - Structural weights)

	Estimate	S.E.	C.R.	P
Retention <-- Amotivation	-.542	.0	-	**

	Estimate	S.E.	C.R.	P
Retention <-- Amotivation	-.542	.080	-6.754	**
Retention <-- Intrinsic_Motivation	.320	.089	3.595	**
Retention <-- Extrinsic_Motivation	.243	.091	2.461	.014

3.7: Standardized Regression Weights: (On Campus - Structural weights)

	Estimate
Retention <--- Amotivation	-.594
Retention <--- Intrinsic_Motivation	.350
Retention <--- Extrinsic_Motivation	.266

3.8: Covariances: (On Campus - Structural weights)

	Estimate	S.E.	C.R.	P
Amotivation <--> Intrinsic_Motivation	-.011	.009	-1.190	.234
Intrinsic_Motivation <--> Extrinsic_Motivation	.057	.011	4.990	**
Amotivation <--> Extrinsic_Motivation	.022	.010	2.319	.020

3.9: Correlations: (On Campus - Structural weights)

	Estimate
Amotivation <--> Intrinsic_Motivation	-.134
Intrinsic_Motivation <--> Extrinsic_Motivation	.716
Amotivation <--> Extrinsic_Motivation	.276

3.10: Variances: (On Campus - Structural weights)

	Estimate	S.E.	C.R.	P
Intrinsic_Motivation	.080	.014	5.784	**
Extrinsic_Motivation	.080	.015	5.500	**
Amotivation	.080	.017	4.784	**

Students learning style and attitude with information visualization

Dalia Alyahya¹, Suzan Alyahya²

¹King Saud University, Instructional Design and Technology, Saudi Arabia
Dmalyahya@ksu.edu.sa

²Princess Nora bint AbdulRahman University,
Instructional Design and Technology, Saudi Arabia

Abstract: This study focuses on how learners process information visualization by exploring the relationship between fifty undergraduate learners' performance and their viewing behaviors gained from eye tracking. Furthermore, students' learning styles was investigated through different deployed learner attention. Learner preferences towards the usage of information visualization content for learning was discussed through qualitative and quantitative results. These results explored the in-depth understanding of learner behavior while learning from visual content such as areas of interest, time spent on object, visual paths and frequency of visits to an object.

Background: The visual representation of information delivers ease in learning. Tufte (1990) stated that information presented as visual instructions helps and affects learning by providing large chunks of information communicating faster than textual representation. According to Zhang, Zhou, Briggs, and Nunamakerjr (2006) multimedia based training systems provides the same level of effectiveness as face-to-face instruction in both teaching and learning.

Therefore it is important to investigate how Human brain processes and understand the complex visual information. It is indeed essential to understand how learners' understand the information presented visually and what are the key factors that affect learning. In order to improve learning effectiveness it is important to optimize the learning process by understanding the viewing behavior of learners with different learning preferences. Previously, the think-aloud protocol based interview was frequently used technique to investigate cognitive activities during learning (LeCompte & Preissle, 1993; Mintzes, Wandersee, & Novak, 1999). In recent years the eye tracking method has become the center of attraction for researchers to study basic cognitive processes during learning and information processing (Rayner, 1998, 2009). This technique is significant as it can recode the online cognitive activities, which can track the cognitive process of learning. It can provide in-depth cognitive data by observing the eye movement and its areas of interest. Such as: where the participants are looking at (Eye fixation) and for how long do they look at one object (Fixation Duration) and how they move from one object to another (Viewing path) (Holsanova, J., Holmberg, N., & Holmqvist, K. (2009)).

It is important for the educator to understand the learning styles of the learners. This research is intended to investigate the learning style through learner preferences of the participants by acquiring eye tracking data. Every individual has his own experiences, preferences and motivation in his learning processes. Learning styles refer to an understanding method that is presumed to be in the best interest of an individual. Keefe (1991) defined learning style as an indicators of how learners observe, interact with, and respond to the learning environment and also learning style is a characteristic of the cognitive, affective, and physiological behavior. Kraus, Reed and Fitzgerald (2001) stated that learning style is "the focus of an individual's preferred method for receiving information in a learning environment". With this we can understand learning style to be a characteristic preferences of how people take in and process information. Every individual student has his/her unique way of learning. According to Just and Carpenter (1976) the "Eye-Mind" assumption related to eye tracking is, what a person is looking at indicates what he/she is thinking of or attending to. Thus collecting and analyzing eye tracking data leads to derive learning preference of an individual to achieve learning style.

Research Questions: The purpose of this study was finding the relationship between learners' performance and learning style with eye fixation measures overall and for specific area of interests AOI. Also, this study seeks to create a more comprehensive understanding of how do learners view visual information and what is there attitudes toward graphics as a source of information.

Method: This study followed a mixed method design to obtain quantitative and qualitative answers to the research questions. The researchers employed multiple regression analysis to examine how eye fixation measures and learning styles influenced learners' performance, and triangulation of data sources to validate the quantitative results. The dependent variable here was learners' performance and the independent variables were the learning styles and the eye fixation measures, which are fixation duration, number of fixation, and number of visits to a specific AOI. Eye-tracking visualization tools like heat maps and eye paths were used to examine how

learners' view the visual information. Finally, personal interviews were conducted to explore the learner's attitude towards obtaining information from graphical content.

Subject: This study was conducted at a university in the central region of Saudi Arabia, with a convenience sample of approximately fifty learners. Ten students were randomly selected for interviews from the total fifty learners.

Material: The researchers used the, "Rising Sea Levels," graph from McCandless's book (2009) to conduct the study. This graph predicted the flood impact upon cities in the event of an increase in sea level.

Procedure: Learners were approached in public areas on campus with minimal disruption. They were asked to participate for approximately ten minutes. They were given a cover letter and consent form, and after their approval, they began an eye-tracking calibration, and started the task. Upon completion of the task, they took a test. After the test, learners were randomly selected for an interview.

Results:

To answer the research questions, correlation and regression analysis has been conducted. There is week Sperman's rho correlation between learning style with the eye tracking variables and performance at the level 0.05 level. This finding indicates that whenever the participants preferred the verbal learning style it slightly contribute it to higher score of Number of Fixation on AOI, Fixation Duration on AOI, Number of Fixation of whole graph, Fixation Duration of whole graph, Number of Visits to AOI.

Binary Logistic Regression has been conducted. The statistical analysis revealed that there are no variables contributed to predicting the learning style at the significant level 0.05. This may be due to that the majority of the sample prefers visual learning style than verbal learning style (see Table 2)

Table 1 Descriptive Statistics for the variables

Items	n	Mean	Std. Deviation
Performance	50	2.180	1.304
Number of Fixation on AOI (count)	50	116.100	89.463
Fixation Duration on AOI (in secs.)	50	0.355	0.079
Number of Fixation of whole graph (counts)	50	295.240	217.198
Fixation Duration of whole graph (in secs.)	50	0.353	0.079
Number of Visits to AOI (counts)	50	22.000	15.802

Table 2 descriptive statistics of the learning style

Number	Attitude Labels	N	%
1	Verbal little better than the visual	4	8.0
2	verbal and visual is the same	2	4.0
3	Visual little better than the verbal	11	22.0
4	Visual greatly better than the verbal	33	66.0
	Total	50	100.0

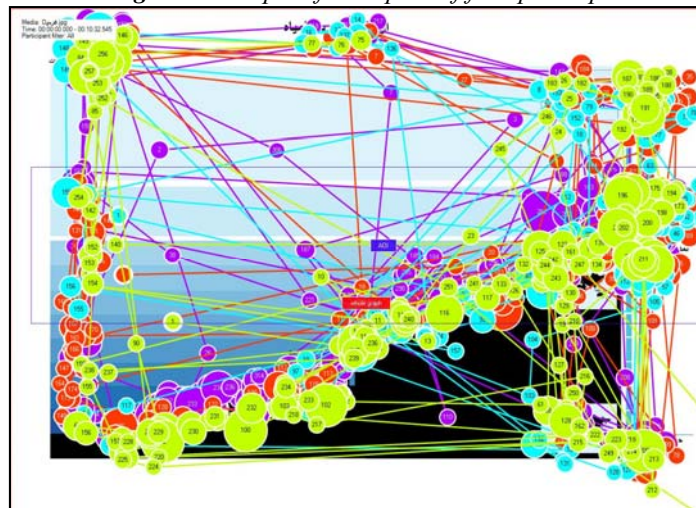
Number and percent of the Attitude Labels shows that the Majority prefer visual than verbal

In addition, there was no significant correlation between Performance and Fixation Duration of the Whole Graph at significance level , $R= 0.015$, t statistics = 0.101 , and P -value = $0.920 > 0.05$. However, there

was a correlation between performance and the number of fixation on the whole graph at the significance level, $R = 0.291$, t statistics = 2.105, and P -value = $0.041 < 0.05$. Number of fixation and fixation duration for the AOI showed no relationship with the learners' performance. However the correlation between number of visits on the AOI and performance resulted in a significant correlation with $R = 0.276$, t statistics = 2.204, and P -value = $0.042 < 0.05$. The two correlations were consistent with those from a number of earlier studies. However, those earlier studies showed stronger relations. (Liu & Chuang, 2011; Rayner, Yang, Schuett, & Slattery, 2013; Schmidt-Weigand, & Scheiter, 2011; Yang et al., 2013). It was assumed that the graph was easy to understand and learners do not need longer time to process information "Longer fixations are generally believed to be an indicator of a participant's difficulty in extracting the information from a display" (Jacob & Karn, 2003, p.585). Significant relationships were found between the performance and number of visits (p -value 0.042 0.050). When learners make more visits to the central area in the graph, their performance increases. Figure 1 shows the eye movement of learners, while comparing how the level of the sea changed through the years while going back and forth between the maps. The finding revealed that the time of fixation duration couldn't be predicted from the learners' performance. An explanation could be that the given graph was not complicated and required less processing time. Also, performance test measures specific number, which was hard to recall due to the high load of information visualization.

Figure 1 shows sample of scan path of the four participants view. The sample path supported comprehensions of individual participant's behavior through the plotted starting points, fixation location, and durational indicator. The learners viewed the picture as a whole and studied the picture's details. The graph shows that the learners spent more time on the right side of the picture due to the amount of information.

Figure 1. Sample of scan path of four participants view



In figure 2 the sample of scan path of one participant's shows that the patterns of view were in two main directions, horizontal and vertical. This was due to the figure design of the information being arranged in the graph edges. This figure shows that the learners use compare and contrast to make meaning of the graph. This can be seen in the horizontal and vertical lines. Some variables need more time to understand than others. This can be seen in the variety of circles size.

Figure 2. Sample of scan path of a participant view

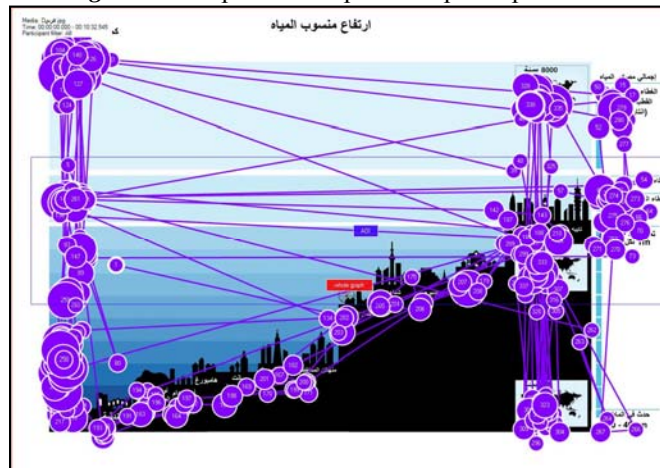


Figure 3 shows the heat map of the participants view. Heat map indicated the highest viewed area by distinguishing it in a distinct color, which is on the right side of the sea level graph. As Jacob and Karn (2003) stated, “the number of fixations on a particular display element (of interest to the design team) should reflect the importance of that element” (Jacob & Karn, 2003, p. 585). In Figure 3, the colors Red, Yellow and Green represents the most, normal and least important areas viewed by the participants respectively.

Figure 3. The heat map of the participants view

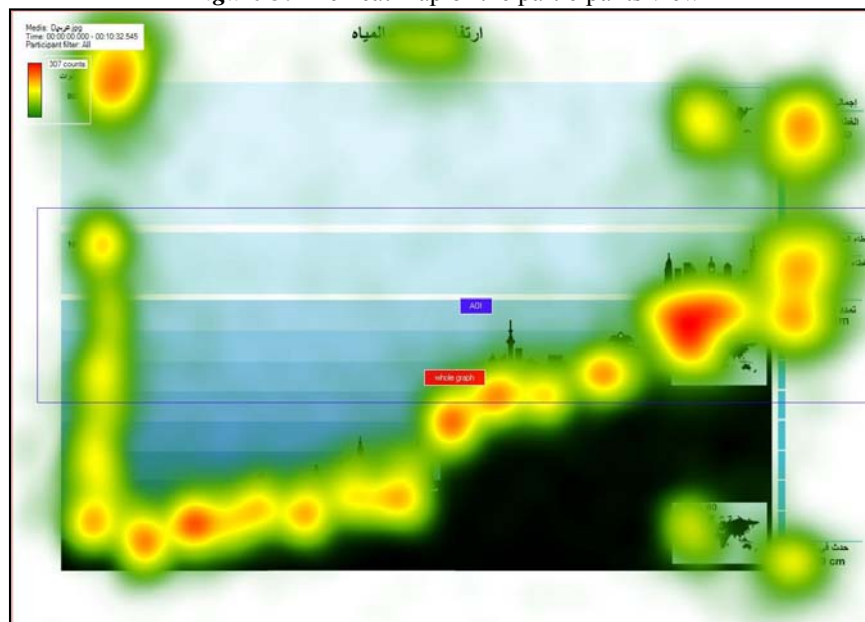
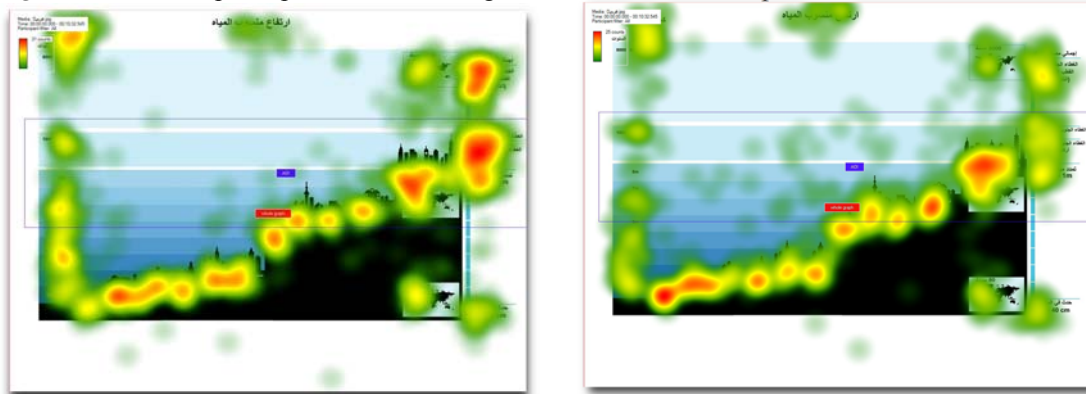


Figure 4 shows a comparison between the highest five grades and the lowest five grade students heat maps. Heat maps show a higher attention on different information for the higher grade learners than the lower grade learners. Furthermore, higher grade learners has less attention on the middle part of the map that has less information than the lower attention learners. This is consists with what Rayner (1998) points out that longer fixation duration are generally indicative of more extensive processing which does not correspond to the current study.

Figure 4. A heat map comparison between highest and lowest students performance.



High Performance

Low Performance

Moreover, Learners found the Rising Sea Levels graph interesting and fun for studying. Also, learners' attitude indicated that they found graphics helpful in understanding the information "I understand the graph quickly and easily", "I like to see the information visually, I can remember it for a longer period of time". Also learners thought that the graph helped them to remember the information and recall it easily, "I do not remember every single city, but I got the main idea about how sea level affects the earth", "I can remember some of the main cities like New York", "and the graph is there in my mind, I can recall it". However some learners indicated that the concept is complicated, "it is hard to remember everything, and there is so much information". This concludes that the learners form two levels of understanding, the conceptual idea and the specific information such as the city name. Moreover, the graph has helped the learners to recall information and easily understand the concept.

This study focused upon information visualization graph with complexity in order to investigate learners' performance and learning style with eye fixation measures. However it is recommended to conduct further qualitative studies based upon multiple images with different levels of complexities. It will provide more detailed understanding of cognitive multimedia learning, learner experiences and learning styles and preferences perceptions. Furthermore, additional studies can be carried out to measure analytical abilities through visual information of groups based upon gender, IQ (Intelligence Quotient) and educational qualifications.

The possibilities of research studies with these instruments are unlimited. Studies that explore cognitive activities on Complex charts, graphs and maps, differences between general images, images with voice over and images with interactivity will be beneficial for the designers and developers to prepare more appropriate graphical content. Further studies needed related to multimedia learning based on color-coding while designing instructional material and diverting learners' attentions to a defined area of interest. It will provide firm background and guidelines for the instructional designers and developers to develop effective multimedia enriched pedagogical agents that communicate efficiently with the learners and their learning styles.

References:

- Ainsworth, S. (2006). *DeFT: A Conceptual framework for considering learning with multiple representations*. Learning and Instruction, 16(3), 183-198.
- De Koning, B. r. B., Tabbers, H. K., Rikers, R. M. J. P., & Paas, F. (2009). *Towards a framework for attention cueing in instructional animations: Guidelines for research and design*. Educational Psychology Review, 21(2), 113-140.
- Holsanova, J., Holmberg, N., & Holmqvist, K. (2009). *Reading information graphics: The role of spatial contiguity and dual attentional guidance*. Applied Cognitive Psychology, 23(9), 1215-1226.
- Huber, S., & Krist, H. (2004). *When is the ball going to hit the ground? Duration estimates, eye movements, and mental imagery of object motion*. Journal of Experimental Psychology: Human Perception and Performance, 30(3), 431-444.
- Jacob, R. J., & Karn, K. S. (2003). Eye tracking in human-computer interaction and usability research: Ready to deliver the promises. *Mind*, 2(3), 4.
- Liu, H.-C., & Chuang, H.-H. (2011). *An examination of cognitive processing of multimedia information based on viewers' eye movements*. Interactive Learning Environments, 19(5), 503-517.
- Mayer, R. E. (2010). *Unique Contributions of Eye-Tracking Research to the Study of Learning with Graphics*. Learning and Instruction, 20(2), 167-171.
- McCandless, D. (2009). *The visual miscellaneum: a colorful guide to the world's most consequential trivia*. New York: Harper Design.
- Rayner, K., Yang, J., Schuett, S., & Slattery, T. J. (2013). *Eye movements of older and younger readers when*

- reading unspaced text. Experimental Psychology, 60(5), 354-361. doi: 10.1027/1618-3169/a000207*
- Scheiter, K., & van Gog, T. (2009). *Using eye tracking in applied research to study and stimulate the processing of information from multi-representational sources. Applied Cognitive Psychology, 23(9), 1209-1214.*
- Schmidt-Weigand, F., & Scheiter, K. (2011). *The role of spatial descriptions in learning from multimedia. Computers in Human Behavior, 27(1), 22-28.*
- Shepard, R. N. (1967). *Recognition memory for words, sentences, and pictures. Journal of Verbal Learning and Verbal Behavior, 6(1), 156-163.*
- Tufte, E. R. (1990). *Envisioning information. Cheshire, Conn.: Graphics Press.*
- Tufte, E. R. (2001). *The visual display of quantitative information 2nd ed. Cheshire, Conn.: Graphics Press.*
- Yang, F.-Y., Chang, C.-Y., Chien, W.-R., Chien, Y.-T., & Tseng, Y.-H. (2013). Tracking learners' visual attention during a multimedia presentation in a real classroom. *Computers & Education, 62, 208-220. doi: 10.1016/j.compedu.2012.10.009*

The Impact Of Synchronous And Asynchronous Communication Tools On Learner Self-Regulation, Social Presence, Immediacy, Intimacy And Satisfaction In Collaborative Online Learning

Mahnaz Moallem, Ph.D.

University of North Carolina Wilmington

601 South College Rd., Wilmington, NC 28403—USA

Chair AERA Problem-Based Education SIG

Professor of Instructional Technology & Research, Coordinator of Instructional Technology Program &

Grant Coordinator for Watson College of Education

e-mail: moallemm@uncw.edu

Abstract: The emergence of the newer web synchronous conferencing has provided the opportunity for a high level of students to students and students to instructor interaction in online learning environments. However, it is not clear whether absence or presence of synchronous or live interaction will affect the learning processes and learning outcomes to the same extent for all learners with various characteristics, or whether other factors that compensate for the absence of the live interaction can be identified. This paper reports the results of a case study that investigated whether various communication methods (synchronous, asynchronous and combined) impact factors such as self-regulation, social presence, immediacy and intimacy, collaboration and interaction and learning process and outcomes. Multiple sources of data were used to test the consistency of the findings and to examine various factors across different communication methods. The results suggest that factors other than communication methods maybe responsible for learner self-regulation. There is, however, a relationship between student satisfaction, perception of social presence and immediacy and communication methods. The synchronous and combination methods appeared to provide the highest level of social presence followed by the cognitive and emotional support.

INTRODUCTION

The educational and instructional technologies that are emerging from endless array of tools and concepts have changed and continue to change the way online courses are conceptualized, designed, developed and delivered. Some of these powerful and intriguing concepts such as massive, free and open online courses or MOOCs (e.g., Coursera, Udacity, edX) have potential for changing the way we think about the role of the internet in transforming education and training systems. Others bring to mind not so new, but more fundamental questions about learning and instruction in online courses. For example, how digital, readily accessible and scalable, but traditionally delivered online instruction (e.g., video-presentation, computer-based assessment; use of asynchronous communication systems) is compared with small, participatory, highly interactive, intimate and collaborative online instruction (less lectures and testing and use of synchronous communication tools). Aside from the appealing ideology of accessibility and free education for all, the question still remains: which applications and ideas are rising to enhance engagement and motivation and to impact learning in online courses? How various platforms for delivery of online courses can improve learning and promote critical thinking? How personalized and immediate feedback, assessment of complex learning outcomes, encouragement and self-reliance, personalized questioning and coaching and directed social engagement can be enhanced in online learning using new and emerging technology tools?

One of the emerging technology tools for online learning is web synchronous systems or video conferencing tools (e.g., *Blackboard Collaborate*, *WebEx*, *Saba Centra*, *Adobe Connect*, *Cisco Telepresence*). This new technology, which affords a complete suite of communication features, has provided the opportunity for a high level of real-time, students-to-students and students-to-instructor interaction in online learning environments. The potential of these complex communication tools for providing *virtual*, yet interactive learning experiences that are closer to what is possible in face-to-face learning environments (Rourke, Anderson, Garrison & Archer, 2001a and b; Shi & Morrow, 2006), while simultaneously providing high levels of learner control and freedom of space make these tools the best viable option for small and highly interactive and collaborative online courses recently presented as *Semester Online Course* initiative (<http://2u.com/semester-online/>; New York Times, 2012; USA TODAY, 2012).

Synchronous web-conferencing is one of the two communication methods (synchronous and asynchronous) used for delivery of course content and for course-related communication and interaction. While its use is still limited (Sloan, 2013), synchronous method for delivery of online courses brings teacher and students together simultaneously in virtual spaces. Asynchronous method, on the other hand, delivers instruction without any specific timetable using communication tools such as e-mail, discussion boards and web 2.0 tools. Although limited due to the relatively new synchronous web-conferencing tools, studies suggest that absence or presence of synchronous or live interaction affects student perception, motivation, interaction and sense of contribution (e.g., Barbour, McLaren & Zhang, 2012; Chen, Pedersen & Murphy, 2011; Falloon, 2011; Hampel & Stickler, 2012; Han & Johnson, 2012; McBrien, Jones & Cheng, 2009; Schullo, Hilbelink, Venable, & Barron, 2007; Teng, Chen, Kinshuk & Leo, 2012). However, much of this research has focused on the quality of interaction or dialogue and learner perception, rather than learning process and learning outcomes. In addition, few studies attempted to isolate learning strategies used in online courses from delivery platforms, making it difficult to describe if the two types of communication methods (synchronous and asynchronous) for delivery of online courses result in different levels and processes of learning, motivation and satisfaction.

The purpose of the present study was to compare three communication methods (synchronous web-conferencing; asynchronous, and a combined method of synchronous and asynchronous) while keeping learning strategies consistent across each method to find out how they influence learner motivation and self-regulation, social presence, satisfaction and learning process and outcomes, in small, interactive and collaborative online courses. The study specifically answers the following questions:

- How do various communication methods (synchronous, asynchronous and combined) impact factors such as self-regulation, social presence, immediacy and intimacy and satisfaction in online learning?
- How do various communication methods (synchronous, asynchronous and combined) impact student collaboration and interaction as well as learning process and learning outcomes?

REVIEW OF THE LITERATURE

The review of the literature on the effect of the quality and level of interactions offered in various communications modes (i.e. synchronous and asynchronous) on student learning, satisfaction and motivation in online learning environments points to several influencing factors: possibility of affective and interpersonal interactions; social and cognitive presence; immediacy of feedback; motivation and self-regulation; media richness; and collaborative opportunities for learners. These factors are explored in the following sections and are used to construct a framework to guide the present study.

Research on online learning continues to support Moore's contention (1989) of the importance of dialogue or interaction between the teacher and students and among students and between students and learning content for advancing the learning process and for internalizing learning (e.g., Cavanaugh, 2005; Friend & Johnson, 2005; Offir, Lev & Bezale, 2008; Palloff & Pratt, 1999; Shale & Garrison, 1990; Zucker & Kozma, 2003). These and other studies further elaborate that higher level of interactivity (human interaction) captures learner's attention and increases user's engagement with the task environment (e.g., Alessi & Trollip, 2001; Heimich et al., 1989). It is argued that high level of interactivity results in deeper processing of the information, resulting in mastery of the information (Brown, Collins, & Duguid, 1989; Merrill, 1975), aiding the individual in forming a personal mental model of the task (Wild, 1996). According to Moore, distance learning environments, separation between the teacher and students can "lead to communication gaps, a psychological space of potential misunderstandings between the behaviors of instructors and those of the learners" (Moore & Kearsley, 1996, p. 200). Thus, given the literature, one can theorize that when the task is complex and involves the construction of new knowledge, problem solving and shared meaning, the communication utilization of a richer synchronous medium becomes more important (Dennis & Valacich, 1999).

Other studies point that increased interaction results in increased student motivation and satisfaction (e.g., Chiu, Hsu, Sun, Lin & Sun, 2005; Garrison, Anderson, & Archer, 2001; Irani, 1998; Lee, Tseng, Liu & Liu, 2007; Schullo, Hilbelink, Venable, & Barron, 2007; Wang, 2003; Zhang & Fulford, 1994; Zirkin & Sumler, 1995). Furthermore, student's personal perceptions of *social presence* ("degree of salience of other person in the mediated interaction" (Short, et. al., 1979, p. 65)) combined with the capabilities of the medium to present personal and emotional connections (Garrison, 2003) influence interaction, which, in turn, sustain or enhance learner motivation and satisfaction. Included in the construct of social presence are concepts of *immediacy* ("physical and verbal behaviors that reduce the psychological and physical distance between individuals" (Baker, 2010, p. 4)) and *intimacy* (a function of eye contact, physical proximity, topic of conversation, etc. (Argyle & Dean, 1965)). Researchers suggest that instructor's immediacy is positively related to student

cognition, affective learning and motivation (Arbaugh, 2001; Baker, 2004, 2010; McAlister, 2001), and that synchronous online instruction provides more immediacy than asynchronous communication alone (Haefner, 2000; Pelowski, Frissell, Cabral, & Yu, 2005). In addition, a number of studies show that synchronous communication helps break down a sense of isolation, assists in the formation of learning communities and promotes interaction and participation (e.g., Dal Bello, Knowlton, & Chafin, 2007; Fox, Morris, & Rumsey, 2007; Gosmire, Morrison, & van Osdel, 2009; Hrastinski, 2008; Schullo, Hilbelink, Venable, & Barron, 2007; Sharma, 2006; Yang & Liu, 2007).

There is much empirical evidence that motivation and its related theory of self-regulated learning are of great importance for academic achievement (Zimmerman 1990; Zimmerman & Schunk 2001). Self-regulated learning is defined as “an active, constructive process whereby learners set goals for their own learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment” (Perry & Smart, 2002, p. 741). In sum, self-regulated learners are motivated, independent, and metacognitively active participants in their own learning (Zimmerman, 1990). Researchers studied online learning argue that in online learning environments, learners have to assume greater control of monitoring and managing the cognitive and contextual aspects of their own learning. Thus, the learner's self-motivation increases as a result of self-regulatory attributes and self-regulatory processes in online learning (Eom, Wen & Ashill, 2006). This research highlights the impact of self-regulation on learning achievement in online learning as well as influence of online learning on learners’ motivation or self-regulatory behaviors.

Finally, research points to the relationships between media attributes and task complexity in technology mediated learning. The impact of different technology characteristics to present information and for communication may depend on task complexity (Tan & Benbasat, 1990; Tractinsky & Meyer, 1999). In their Media Richness Theory, Daft and Wiginton (1979) refer “richness” to the medium’s capacity for immediate feedback, the number of cues and channels utilizing personalization and language variety. Communications that take a longer time to convey understanding, therefore, are less rich. In this context, the richness of communication features provided by the synchronous and asynchronous tools influence learner’s ability to engage in solving problems and completing complex learning tasks. Researchers contend that performance of a more complex task requires the learner to generate a more elaborate mental model (White & Frederiksen, 1990). Skehan and Foster (2001) further explain “task difficulty has to do with the amount of attention the task demands from the participants. Difficult tasks, therefore, require more attention than easy tasks (p. 196).” Thus, it can be concluded that engaging learners in complex learning tasks (e.g., problem solving and critical thinking) in online learning environments requires utilization of rich media that provide immediate feedback, multiple cues, message tailoring, emotions and contextual cues.

The above-mentioned factors and findings derived from the literature were used to conceptualize a framework that could describe the variables under investigation, their impact on the design and implementation of the study and to provide the researchers the opportunity to gather general constructs into intellectual “bins” (Miles & Huberman, 1994, p. 18) (see Figure 1). As shown in Figure 1, it is conceptualized that an online course can be delivered using various communication methods or delivery systems. While in all modes of communication interaction could be between student-content, student-student and student-instructor (Moore, 1989), the richness and quality of this interaction and its impact on learning and motivation may differ depending on the influence of the factors identified by the literature (see Figure 1).

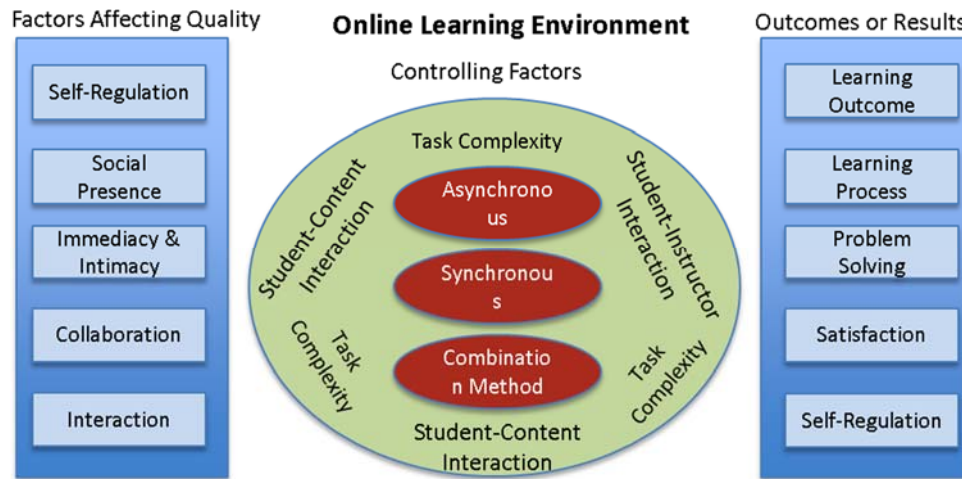


Figure 1. The conceptual framework for the study

RESEARCH CONTEXT AND PROCEDURE

A small three hour graduate core course (maximum of 15 students) in the Instructional Technology program at a midsize southeastern public university was used to conduct the study. The course is only offered in spring semester in each academic year and is a required course for all students enrolled in the program. Students who enroll in this course have been in the program for at least one semester prior to this course (often fall of the same academic year) and have taken at least three credit hours course in the program. The study was conducted in spring of 2011 and was repeated in spring of 2012 with a new group of students. One of the researchers was the instructor of the record for the course. Fourteen students enrolled in spring 2011 course and 13 students enrolled in spring of 2012. At the beginning of each semester and before the classes started, students were invited to participate in the research by signing a standard informed consent protocol. All enrolled students (both in spring 2011 and 2012) agreed to participate in the study. The study had approval from the university IRB committee.

Three modules (two weeks of instruction for each method of delivery) were used to conduct the study. Module 1 (week 2 and 3) was delivered using asynchronous only method of delivery. Module 2 (week 4 and 5) was delivered using synchronous only method and Module 3 (week 5 and 6) was delivered using a combination method. The first meeting for the course was synchronous and virtual and used as an orientation to explain the course, its syllabus, assignments and problem-based orientation and to form collaborative teams and to complete pre-intervention surveys and questionnaires. In order to ensure consistency in learning strategies and task difficulty for all three modules and across two courses, problem-based learning (PBL) or Constructivist Learning Environments model (Jonassen, 2008) was used as the instructional design framework for the course. Therefore, the focus of learning activities for each module was to solve ill-structured real-world problems to apply targeted knowledge and skills for each module while working in collaborative teams. In addition, the three types of interaction (student-content, student-student and student-instructor) were offered for each module regardless of the communication method. The following provides detail procedure for each module.

Module 01 (Week 1 and 2) Asynchronous: Students were assigned readings (e.g., instructors' lecture and multimedia materials) a week earlier. Teams of three or four members were formed to collaborate in completing problem-solving activities for each week. A small group discussion area was created for each team as they worked on their team assignment. A large group discussion forum was also created to provide opportunity for interaction among all students and with the instructor. Students were instructed not to meet synchronously and just use asynchronous tools to communicate and to complete their team assignments even if they might have been in close proximity with each other. At the end of each week, the teams submitted and published their assignment to other groups to review and comment. The instructor also provided written feedback and comments on students' team products and collaboration process in the assignment area.

Module 02 (Week 3 and 4) Synchronous: Students were assigned readings (e.g., instructors' lecture and multimedia materials) a week before live/synchronous meeting. During live/synchronous class meeting, students participated in a large group discussion and/or a demonstration with lecture facilitated by the instructor. The large group discussion proceeded with breaking out the large group into small teams that were formed during Module 01. Teams were assigned to collaborate in completing module's problem-solving assignment for the

week during live and synchronous class in their virtual breakout meeting rooms. Students were offered to continue team discussion in their team's designated virtual room to follow up on live or synchronous class and team discussion. However, students were instructed to only use synchronous meetings for completing weekly team activities. At the end of each week's live meeting, teams presented their assignment to other groups to review and comment and later submitted it in the assignment area. The instructor also reviewed students' product and collaborative process and offered feedback during synchronous or live meeting. In addition to oral comments from both students and the instructors, the instructor provided written feedback on teams' products and collaboration process in the team assignment area.

Module 03 (Week 5 and 6) Combination: Students were assigned readings (e.g., instructors' lecture and multimedia materials) a week earlier. Students were also assigned to work with their previously formed teams and were instructed to begin discussing and collaborating with their teams on each week's problem-solving assignment using a small group discussion in the forum area. A large group discussion forum was also created to provide opportunity for interaction among all students and with the instructor before live and synchronous class discussion. A live and synchronous class discussion and team meetings followed the asynchronous large and small group discussion. During the live and synchronous class meeting, students participated in a large group discussion and/or a demonstration with lecture facilitated by the instructor. The large group discussion proceeded with breaking out the large group into small teams (breakout rooms). Teams then presented their assignment for both peers' and instructor's review and comments and later submitted in the assignment area. As with the previous modules, in addition to oral comments, the instructor also provided written feedback and comments on students' team product and collaboration process.

The course content and course-related communication and interactions were delivered using Blackboard vista (2011) and Blackboard 9 (2012). Horizon Wimba (2011) and WebEx (2012) video conferencing system or Synchronous Communication Systems (SCS) were used for conducting real time classroom discussion and collaborative group work and presentations. Both SCS systems enabled users to communicate using audio, video, and text and to share files, resources, and presentations using applications such as PowerPoint and Flash. Both platforms also offered functionalities such as application and desktop sharing, which were used for collaboration on jointly developed documents, or for other instructional purposes. For synchronous delivery module, while all students used SCS to communicate with each other and the instructor during live interaction, some students were also physically present in the classroom and had an opportunity to see each other face-to-face and distance students through Cisco large video panel in the classroom and video camera on their laptops and to collaborate with distance students using SCS breakout rooms. All students participated in instruction of three units. All assignments, problem-solving activities and discussion topics were kept consistent across the three modules.

PARTICIPANTS

Fourteen students enrolled in spring 2011 course and 13 students enrolled in spring of 2012. Table 2 summarizes student demographic information in each semester. As it is shown in Table 1, students were varied in their age and work experiences in both semesters. While 71-61% of students in each semester indicated that they had not taken an online course that used a synchronous communication tool before, about the same percentage (63-69) noted that they had taken online courses that had used asynchronous communication tools. According to the demographic data, in both semesters students were heterogeneous with regard to age, background and experiences. Students' prior work experiences ranged from teaching to working in business and industry, military and private sectors. In spring of 2011, 35% of students had teaching background in k-12, 10% had administrative background in public schools and higher education and 55% had business and corporate experience. In spring of 2012, 69% of students had teaching background while 30.8 % had experience working in business and industry. In spring 2011, 57% of students were full time and 43% were part time. In spring of 2012, 46% were full time and 54% were part time.

Table 1. Student demographic data

Questions	%		%		%	
	Spring 2011 (N = 14)		Spring 2012 (N = 13)		2011 & 2012 (N = 27)	
Previously taken an online course that used synchronous communication tools	Yes 28.6	No 71.4	Yes 38.5	No 61.5	Yes 33	No 67
Previously taken an online course that primarily used asynchronous communication (forum; e-mail) tools	Yes 63.3	No 35.7	Yes 69.2	No 30.8	Yes 67	No 33
Number of credit hours taken in the program?	3-9 courses		2-10 courses		2-10 courses	
Age	22-30 50	31+ 50	22-30 38.5	31+ 61.5	22-30 42.4	31+ 53.6
Gender	M 28.6	F 71.4	M 46.2	F 53.8	M 37	F 63
Prior college degrees.	BS/B A 85	ML A 15	BS/B A 100	MS/M A 0	BS/B A 85	ML A 15
Prior years' work experience	2-24		6-27		2-27	

During the first class meeting (orientation to the course) students were ask to complete Felder and Soloman's (1998) Index of Learning Styles Survey (a self-scored survey) and report their results to the instructor. Table 2 shows the results. With regard to how students preferred to process information, in 2011 more students were reflective learners (learning by thinking things through; working alone) while in 2012 the majority of students were active learners (learning by trying things out; working with others). In both years, more students were oriented toward learning facts and procedures (sensing) rather than concepts, theories and meanings (intuitive) and were more visual than verbal. In 2011, similar number of students preferred learning sequentially (in small steps and in orderly manner) and globally (learning holistically and is larger steps). However, in 2012, more students preferred learning sequentially.

Table 2. Students' learning styles results

Learning Styles	% %/(#/13) 2011 (#/13) 2012	Learning Styles	% %/(#/13) 2011 (#/13) 2012	Learning Styles	% %/(#/13) 2011 (#/13) 2012	Learning Styles	% %/(#/13) 2011 (#/13) 2012
Reflective	53.8 (7) 7.1 (1)	Intuitive	23.1 (3) 7.7 (1)	Visual	61.5 (8) 61.5 (8)	Sequential	46.2 (6) 69.2 (9)
Active	38.5 (5) 76.9 (10)	Sensing	69.2 (9) 76.9 (10)	Verbal	38.5 (5) 30.8 (4)	Global	53.8 (7) 23.1 (3)
Balanced	7.7 (1) 15.4 (2)	Balanced	7.7 (1) 15.4 (2)	Balanced	0 7.7 (1)	Balanced	0 7.7 (1)

METHODOLOGY

The study adopted an interpretive or descriptive case study methodology to explore the questions of the study in its context using variety of data sources (Yin, 2003, 2014). According to Yin (2003), a case study design should be considered when: (a) the focus of the study is to answer "how" and "why" questions; (b) it is difficult to manipulate the behavior of those involved in the study; (c) it is important to cover contextual conditions because they are relevant to the phenomenon under study; or (d) the boundaries are not clear between the phenomenon and context. Thus, even though the results are limited in terms of "generalizability," a case study methodology was found to be suited for the study because it allowed the researchers to gain deeper insights into values of various communication methods for delivery of online courses.

Multiple sources of data were used to test the consistency of the findings and to examine various factors across different communication methods. The following data-gathering strategies were used: (1) questionnaires to measure student self-regulation, perception of social presence, immediacy and intimacy and student satisfaction;

(2) an inventory to assess student learning styles; (3) archive records of student collaboration during group work; (4) results of assessment (knowledge quizzes and solutions to the problem solving tasks) of students' learning of the content and achievement of the modules' objectives; (5) instructor's perception and reflection logs and students' responses to reflective questions at the end of each intervention/module; and (6) archive of student postings, chat logs and audio archive of SCS class discussion.

Different techniques (quantitative and qualitative) were used to organize and systematically review and analyze various types of information. Statistical analyses examined the interrelationship among variables within each delivery method first, and then the results were used to make comparisons across the three methods of delivery, looking for differences, similarities and patterns. In addition, comparative analysis was conducted between data collected in spring 2011 and the replicated study in spring 2012. The primary focus of this comparative analysis was on the overall pattern of results and the extent to which the observed pattern of variables in 2012 matched those of 2011 and if not what differences were observed.

RESULTS

Research Question 1. *How do various communication methods (synchronous, asynchronous and combined) impact factors such as motivation and self-regulation, social presence, immediacy and intimacy, satisfaction, collaboration and interaction?*

SELF-REGULATION

Student self-regulation skills were assessed at the beginning and at the end of each module using Motivated Strategies for Learning Questionnaire (MSLQ) developed by Pintrich, Smith, Garcia, and McKeachie (1991). However, in order to triangulate the consistency of the results, motivation or student self-regulation skills were also assessed using observation of students' behaviors using criteria such as participation in collaborative activities and discussion, interaction with the content and responses to a series of reflective questions.

The adopted scale for assessing self-regulation consisted of 38 items (scale of 1-7; 1=not true of me; 7 = very true of me) in six categories: *Intrinsic* (4 items), *Extrinsic* (4 items), *Task Value* (6 items), *Control of Learning Beliefs* (4 items), *Self-efficacy* (8 items), and *Self-regulation* (12 items) with reported reliability ranged from 0.52 to 0.93 (Pintrich, et al, 1991). The survey was administered prior to the intervention and then administrated at the end of each method. The Cronbach's alpha reliability Co-efficient was .74 (2011) .96 (2012) for 38 items in six categories. The data collected from both semesters were analyzed using a paired sample *t*-test. The results did not show any significant difference between students' self-regulation prior to the course and after each intervention. Students' overall average score on four items measured *intrinsic motivation* was high prior to the course (ranging from 6.46 to 5.25) and remained high at the end of each module with slightly better scores for synchronous and mixed methods (see Appendix A). Students' overall average score for 4 items measured *extrinsic motivation* was lower (5.55 to 3.62) compared to intrinsic motivation (6.43 to 5.55) prior to the intervention, and remained the same at the end of each module suggesting that students appeared to remain more intrinsically motivated to learn the content of the course (see Appendix A). The overall average scores for extrinsic motivation across the three delivery methods in 2011 were higher suggesting that 2011 students were more extrinsically motivated.

The overall average score for six items measured *task-value* was high prior to the intervention and remained consistently high at the end of each method. This result was not surprising since the course is a required foundation course and students perceive the course content as being important to their program of study (see Appendix A).

The overall average scores for four items measured *control of learning* were high prior to the intervention. The average score for one of the two negative items ("If I don't understand the course it is because I did not try hard enough") declined slightly (although not significantly) at the end of module two (synchronous learning approach) in 2011 (5.9 to 4.9) suggesting that students seemed to feel more in control of their own learning before intervention. This difference was also observed in year 2012 data (from 5.5 to 5.0) although not significant. In year 2012, pairwise comparison of the average score between pre-intervention and the three delivery methods for a positive item ("If I try hard enough then I understand the course materials") showed significant difference between pre-intervention and after module one (asynchronous method) (M difference = 0.45 (SD =.69); $t(2.19, df = 10) p < .05$) and module two (synchronous method) (M difference = 0.80 (SD=1.03); $t(2.45, df =9) p < .05$). Again, this result suggests that 2012 students felt more confident in their ability to control their own learning before the intervention and it is likely that they lost some of this confidence after the synchronous and asynchronous methods (see Appendix A). There was no significant difference between pre-

intervention and combination method suggesting that the control of learning was sustained during combination method.

The overall average scores for eight items measured *self-efficacy* as high (6.72 to 5.42) prior to the intervention and remained consistently high at the end of each method with no significant difference between students' self-efficacy prior to the course and after each intervention.

The overall average scores for ten out of 12 positive items measured *metacognitive or self-regulation* skills as moderately high and remained moderately high (6.14 to 4.93) at the end of each method, with no significant improvement. Average scores for two negative items were also moderately low prior to the intervention and remained moderately low (4.78 to 3.57) with no significant decrease at the end of each method. Although not significantly different, mean scores in 11 items (except for item 34) in both years were slightly higher for the synchronous and combination methodologies, suggesting that students' motivation or self-regulation might have improved slightly at the end of the synchronous and combination methods.

In sum, the results of self-regulation survey pointed to no significant changes across various methods of delivery. However, slight positive changes were observed in student self-regulation for the combination methodology. As indicated earlier, observation of students' behaviors also confirmed this result. In addition, students' responses to the reflective questions indicated that in response to the question: "Overall, how would you explain your learning experiences for the past two weeks? Do you think you achieved the modules' objectives? If not why, if yes, how?" more students indicated that they achieved the objectives of the module at the end of combination method and thought the mixed method allowed them multiple opportunities for learning the materials. Analysis of self-regulation data, therefore, suggests that it is very likely that students' motivation or self-regulation are influenced by factors other than the communication method.

SOCIAL PRESENCE

A 12 item social presence scale originally constructed by Gunawardena and Zittle (1997) measured students' reaction to social presence or student ability to participate in community of inquiry to construct meaning (scale of 1 to 5, 1 = very unsatisfied, 5 = very satisfied) in three categories: *affective* or expression of emotion (5 items), *interactive* or open communication (4 items) and *cohesive* or group commitment and sense of belonging (3 items). Modification of the wording of the scale was made as needed to adjust it to the courses content. Permission was obtained from Gunawardena to make these minor modifications and use the scale. Cronbach's alpha reliability for the 12 items was .82. Students in both years consistently scored the synchronous and combination method higher than the asynchronous method for all 12 items. In addition, except for item one ("Messages in the unit were impersonal") and nine ("Discussions using the classroom technology tend to be more impersonal than face-to-face discussions"), there was significant difference between the asynchronous and combination method for 10 items for both 2011 and 2012 years and between the asynchronous and synchronous and combination method for some items within the categories of affective and cohesion (see Table 3).

Analysis of overall scores for both years using a paired sample *t*-test showed that the average scores for all items except item 1 ("Messages in the unit were impersonal") increased significantly between the asynchronous and combination method as well as in four areas in the category of affective between the asynchronous and synchronous and synchronous and combination method. Significant difference was also observed in item five ("The introductions in the unit enabled me to form a sense of online community") and item 12 ("I was able to form distinct individual impressions of some course participants") between the synchronous and combination method.

The consistency of the results of the social presence survey for both years confirms that students see more likelihood for emotional expression and group interaction and collaboration in the combination method approach. However, students did not see significant difference in communicating freely and openly across various methods, although some differences were observed in favor of the synchronous versus asynchronous method. This result is not surprising since the combination method provided more opportunities for establishing interpersonal and emotional connections, which could have created a stronger sense of social presence. In addition, the results suggest that social presence is still stronger (although not significantly different) for the synchronous method compared with the asynchronous method.

Table 3. Results of social presence

Item Scale 1-5 (1 = very unsatisfied, 5 = very satisfied) Item 1-5 (affective); 6 - 9 (interactive); 10 -12 (cohesive)	Asynch		Synchs		Mixed	
	M (SD)	N	M (SD)	N	M (SD)	N
1. Messages in the unit were impersonal.	3.33 (.89)	12	3.33 (.78)	12	3.75 (.97)	12
	3.71 (1.2)	14	3.46 (.69)	11	3.36 (.92)	11
2. The communication used in this unit was an excellent medium for social interaction.	2.25 (1.3)	12*	3.42 (1.1)	12*	4.50 (.67)	12*
	2.79 (.80)	14*	3.55 (1.2)	11*	4.55 (.52)	11*
3. I felt comfortable conversing through this unit's medium.	2.83 (1.0)	12*	3.75 (1.2)	12*	4.75 (.62)	12*
	3.21 (1.1)	14*	3.82 (.60)	11*	4.46 (.52)	11*
4. I felt comfortable introducing myself in this unit.	3.67 (1.0)	12*	4.42 (.52)	12	4.75 (.52)	12*
	3.71 (.83)	14	4.18 (.75)	11	4.73 (.47)	11
5. The introductions in the unit enabled me to form a sense of online community.	3.17 (.94)	12*	3.00 (1.2)	12*	4.50 (.52)	12*
	3.29 (.73)	14*	3.64 (1.1)	11	4.36 (.51)	11*
6. I felt comfortable participating in the discussions.	3.67 (.78)	12	3.92 (1.1)	12	4.33 (.89)	12
	3.64 (1.0)	14*	4.00 (.63)	11*	4.55 (.52)	11*
7. The instructor(s) created a feeling of a community.	4.00 (.74)	12	4.08 (.90)	12	4.33(.65)	12
	3.43 (.76)	14*	3.82 (.75)	11	4.46 (.69)	11*
8. The instructor(s) facilitated discussions in the modules.	4.00 (.74)	12	3.91 (.83)	12	4.25 (.87)	12
	3.64 (.63)	14*	3.82 (.98)	11*	4.64 (.51)	11*
9. Discussions using the classroom technology tend to be more impersonal than face-to-face discussions.	3.00 (1.0)	12	3.33 (1.2)	12	3.75 (1.1)	12
	3.57 (1.3)	14	3.82 (.87)	11	4.20 (.78)	11
10. I felt comfortable interacting with other participants throughout the unit.	3.58 (1.1)	12*	3.58 (1.2)	12*	5.58 (.90)	12*
	3.43 (1.1)	14*	4.09 (.30)	11	4.27 (.65)	11*
11. I felt that my point of view was acknowledged by other participants throughout the unit.	3.58 (.90)	12*	3.83 (1.2)	12	4.58 (.52)	12*
	3.50 (.86)	14	4.09 (.54)	11	4.18 (.60)	11
12. I was able to form distinct individual impressions of some course participants	3.23 (1.1)	12*	3.92 (.97)	12	4.17 (.72)	12*
	3.36 (.84)	14*	4.00 (.63)	11	4.00 (.78)	11*

*Significant Difference ($p < .05$)

IMMEDIACY AND INTIMACY

A 34-item scale (items taken from a scale created by Gorham, 1988) measured students' reaction (scale of 1 to 5) to the construct of social presence as it relates to *immediacy* ("physical and verbal behaviors that reduce the psychological and physical distance between individuals" (Baker, 2010, p. 4)) and *intimacy* (a function of eye contact, physical proximity, topic of conversation) in two categories of verbal (20 items) and non-verbal (14 items) communication. Cronbach's alpha reliability for the scale was .78. Interestingly enough, except for a few items that addressed instructor's physical gestures during communication (e.g. "Looks at class while talking"; "Gestures while talking") there were no significant differences across the asynchronous, synchronous and combination methods for the majority of the items in the categories of verbal and non-verbal communication (see Table 4). However, the average scores for two items in the category of verbal showed significant differences between the asynchronous and synchronous methods, although average score for the first item was low (item 1: "Uses personal examples or talks about experiences she/he has had outside of class" (M difference = -.46 (SD = 1.0); $t(-2.11)$ (df = 21) $p < .05$); item 5: "Addresses students by name" (M difference = -.18 (SD = .40); $t(-2.2)$ (df = 21) $p < .05$). There was also a significant difference in item 19 ("Will have discussions about things unrelated to class with individual students or with class as a whole") between the asynchronous and synchronous methods (M difference = -.18 (SD = .85); $t(-2.2)$ (df = 21) $p < .05$) and between the asynchronous and combination method (M

difference = -.68 (SD =1.0); t (-3.2 (df = 21) $p < .05$). A significant difference was also found between the asynchronous and combination method for item 16 (“Asks questions that solicit viewpoints or opinions” (M difference = .48 (SD = .74); t (2.36 (df = 20) $p < .05$).

Table 4. Results of immediacy and intimacy

Answer Options Item 1-20 (Verbal) Item 21-34 (Non-verbal)	Asynch	Synch	Mixed
	2011M(SD) 2012 M (SD)	2011M (SD) 2012 M (SD)	2011 M (SD) 2012 M (SD)
1. Uses personal examples or talks about experiences s/he has had outside of class.	3.66 (1.07)* 3.54 (.97)	4.09 (.93)* 3.82 (.98)	3.89 (1.2) 3.64 (.92)
5. Addresses students by name.	4.83 (.39)* 4.70 (.48)	4.90 (.30) * 5.00 (.00)	4.78 (.44) 4.91 (.30)
16. Asks questions that solicit viewpoints or opinions.	4.91 (.30)* 4.46 (.52)	4.37 (.67) 4.64 (.51)	4.33 (.71)* 4.20 (.63)
19. Will have discussions about things unrelated to class with individual students or with class as a whole.	2.17 (1.1)* 2.23 (.83)	2.82 (1.1)* 2.36 (.92)	2.89 (.93)* 2.73 (1.2)
22. Gestures while talking to class.	3.67 (1.07) 3.39 (1.1)	4.09 (.54) 3.73 (1.1)	4.00 (.71) 3.64 (1.1)
31. Stands behind podium or desk while teaching.	2.92 (.94) 3.82 (1.27)	3.27 (1.68) 3.09 (.83)	3.56 (1.3) 3.18 (1.3)

*Significant Difference ($p < .05$)

Overall, the results of the immediacy and intimacy survey show that except for a few physical behaviors that are naturally absent in an asynchronous communication method and verbal intimacy behaviors that are often established as a result of physical proximity, there is no major difference across various communication methods. In other words, when learning strategies emphasize multiple forms of interactions, collaboration among students and instructor’s feedback (high social presence), students do not feel a sense of isolation, are able to form learning communities, and use interaction and collaborative problem-solving activities to feel closer to their peers and the instructor.

STUDENT SATISFACTION

Student satisfaction was measured at the end of each intervention using a 20-item questionnaire (scale of 1 to 5, 1 = very unsatisfied, 5 = very satisfied) with three sub-categories: *teacher social presence* (6 items); *teacher support* (8 items) and *student interaction and collaboration* (6 items). The survey items were compiled from the literature. Cronbach’s alpha reliability was .91. The results showed that 2011 students rated items related to “teacher social presence” higher for the synchronous method and highest for the combination method, although the differences except for item 5 (“Overall, the instructor for this course helped to keep students engaged and participating in productive dialog”) were not significant. However, the results were somewhat different for year 2012. Students in 2012 rated all six items in the category of teacher social presence significantly different between the asynchronous and combination methods, as students in year 2012 thought the instructor’s social presence was significantly higher for the combination method compared with the asynchronous method. The difference between the asynchronous and synchronous was not significant.

Students in years 2011 and 2012 also rated all items related to the category of “teacher support” higher for the synchronous and highest for the combination method with significant difference between the asynchronous and combination method for year 2012 for all items except the two items that measured instructor’s feedback. The latter result suggested that 2012 students felt more supported by the instructor during the combination approach compared with the asynchronous method. However, they did not think that the instructor’s feedback was significantly different across all three methods, although slightly better in the synchronous and combined methods.

Items measured “student interaction and collaboration” showed similar pattern of response. Both 2011 and 2012 students scored the synchronous and combination approaches higher than the asynchronous approach, although the difference except for item 15 (“I work with others”) was not significant. 2012 students rated item 15 significantly higher for the combination method compared with the asynchronous method suggesting that they had more opportunities to work with others when combination method was used.

Table 5. Results of student satisfaction

Answer Options	Asynch	Synch	Mixed
Item 1-6 (Teacher Social Presence)	2011 M (SD) 2012 M (SD)	2011M (SD) 2012 M (SD)	2011 M (SD) 2012 M (SD)
1. Overall, the instructor for this course was helpful in identifying areas of agreement and disagreement on course topics that assisted me to learn.	4.15 (.69) 3.62 (.87)*	4.23 (.60) 4.00 (.77)	4.60 (.70) 4.39 (.87)*
2. Overall, the instructor for this course was helpful in guiding the class towards understanding course topics in a way that assisted me to learn.	4.46 (.77) 3.54 (.88)*	4.61 (.65) 4.09 (.83)	4.70 (.48) 4.40 (.51)*
3. Overall, the instructor in this course acknowledged student participation in the course (for example replied in a positive, encouraging manner to student submissions).	4.54 (.66) 4.00 (.58)	4.61 (.65) 4.00 (.89)	4.60 (.52) 4.39 (.65)
4. Overall, the instructor for this course encouraged students to explore new concepts in this course (for example, encouraged "thinking out loud" or the exploration of new ideas).	4.39 (.87) 4.00 (.58)*	4.38 (.87) 3.91 (.83)	4.20 (.79) 4.62 (.51)*
5. Overall, the instructor for this course helped to keep students engaged and participating in productive dialog.	4.46 (.66) 3.54 (.88)*	4.46 (.66) 3.91 (.94)*	4.70 (.79)* 4.58 (.70)*
6. Overall, the instructor for this course helped keep the participants on task in a way that assisted me to learn.	4.54 (.66)* 3.54 (.88)*	4.53 (.66) 3.91 (.94)	4.70 (.48)* 4.69 (.61)*
Item 7-14 (Teacher Support)			
7. If I have an inquiry, the instructor finds time to respond.	4.69 (.75) 4.15 (.90)*	4.62 (.77) 4.55 (.52)	4.90 (.31) 4.95 (.55)*
8. The instructor helps me identify problem areas in my study.	4.08 (1.04) 3.46 (.88)*	4.39 (.87) 4.09 (1.1)	4.00 (1.05) 4.59 (.80)*
9. The instructor responds promptly to my questions.	4.54 (.78) 3.93 (.64)*	4.69 (.63) 4.55 (.82)	4.90 (.31) 4.85 (.82)*
10. The instructor gives me valuable feedback on my assignments.	4.39 (.96) 3.90 (.76)*	4.46 (.97) 4.18 (.98)	4.60 (.70) 4.65 (1.14)*
11. The instructor adequately addresses my questions.	4.39 (.87) 4.00 (.71)*	4.54 (.78) 4.64 (.51)	4.80 (.42) 4.61 (.65)*
12. The instructor encourages my participation.	4.54 (.78) 4.08 (.86)*	4.54 (.78) 4.45 (.69)	4.60 (.70) 4.77 (.44)*
13. It is easy to contact the instructor.	4.62 (.65) 4.31 (.75)*	4.62 (.87) 4.55 (.93)	4.90 (.32) 4.77 (.44)*
14. The instructor provides me with positive and negative feedback on my work.	4.62 (.86) 4.27 (.80)	4.62 (.87) 4.50 (.71)	4.60 (.70) 4.60 (.66)

Item 15-20 (Students Interaction & Collaboration)			
15. I work with others.	4.61 (.87) 4.33 (.60)*	4.85 (.38) 4.45 (.69)	4.90 (.32) 4.61 (.51)*
16. I relate my work to others' work.	4.31 (.63) 4.15 (.69)	4.38 (.65) 4.27 (.65)	4.30 (.95) 4.38 (.65)
17. I share information with other students.	4.46 (.66) 4.30 (.63)	4.54 (.66) 4.45 (.52)	4.70 (.48) 4.46 (.78)
18. I discuss my ideas with other students.	4.38 (.65) 4.23 (.60)	4.46 (.66) 4.36 (.80)	4.50 (.71) 4.53 (.66)
19. I collaborate with other students in the class.	4.69 (.48) 4.15 (.80)	4.77 (.44) 4.36 (.67)	4.80 (.63) 4.46 (.77)
20. Group work is a part of my activities.	4.70 (.48) 4.30 (.48)	4.77 (.44) 4.36 (.67)	5.00 (.00) 4.3 (.66)
2011 N	13	13	10
2012 N	13	11	13

*Significant Difference ($p < .05$)

Cross analysis of the results of satisfaction survey with students' learning styles indicated that the differences between students' rating in year 2011 and 2012 could have been due to differences in students' preferred learning styles and their strong opinion about learning. While more than half of the students (54.5%) in year 2011 were reflective learners the majority of students in year 2012 were active learners (75.6%). Further analysis of students' responses to open-ended reflective questions at the end of each method confirmed that reflective learners tended to be more positive about the asynchronous only communication method compared with active learners, although it appeared that using various methods helped students reconsider their preferred styles of learning. The following are example excerpts of the comments made by the active and reflective learners.

Active learners

"... Over the past two weeks I realized that I rely on auditory information to aid me in fully understanding the material."

"... I prefer to discuss ideas rather than contribute in a written thread."

"... I like being able to bounce ideas/thoughts/questions off of others. It was difficult not having that class discussion."

"... I get a lot out of the face-to-face meetings and discussion about the topic." "The advantage was that I like to talk over topics in real-time and have an exchange of ideas."

Reflective learners

"... It was easier to focus on the texts and use the discussion area to improve my understanding."

"... I had to re-read the materials for better understanding and try to answer my own questions."

"... I am a thinker who needs to process and think about stuff and then it kind of comes to me in a flash and that was easier to do when I didn't have a lot of "voices" coming at me in a group conversation where I have to think on the run and process what everyone is saying with no time to think about it.

"... because I was forced to do more writing and pay closer attention to the readings."

Overall, the results of this survey showed that students' satisfaction was high regardless of the method of delivery, although students appeared to be more satisfied with combination methodology. The results further showed that students' satisfaction was higher (although not significantly) for the synchronous and combination methods in the two categories of "teacher social presence" and "student interaction and collaboration" and significantly higher for combination method in the category of "teacher support." This result suggests that students appear to be more satisfied with the synchronous and combination methodology in these very important areas.

Research Question 2. *How do various communication methods (synchronous, asynchronous and combined) impact student collaboration and interaction as well as learning process and learning outcomes?*

In addition to satisfaction survey items that measured collaboration and interaction across three methods of instruction, student collaboration and interaction were also assessed using archive records of student collaboration during group work, reflective questionnaire at the end of each module and assessment of teams' solutions to the problems (team activities). As indicated earlier, survey items showed that students rated

collaboration and interaction somewhat higher for synchronous and combination method (although not significantly except for one item) compared with asynchronous method. This finding was consistent with the students' responses to the reflective questions in which they thought it was easier to work with their peers to complete problem-solving activities during combination method although they were still able to work collaboratively in both asynchronous and synchronous only methods as well.

The following are excerpts of students' responses to reflective questions at the end of each communication method.

Synchronous only method

"... It was a bit inefficient to have to talk about everything, instead of being able to post questions or comments for later reflection or response."

"I felt it was harder to get together with team members since we had to meet in real time, but the end result was much better since we didn't have to wait for feedback."

"The team work was easier in that we were VERY focused to complete the activity so it did not carry on and on thereby requiring additional meetings."

"... I found it easier in that we could discuss activities face to face, but it also was difficult in that if I didn't make the meetings or class, I did not know what was going on and could not contribute to the activities or to class."

Asynchronous only method

"... The biggest challenge for me was in having to wait online for people to respond to simple questions or tasks that involved procedures."

"... The challenge was in doing the activities just through the discussion area. But, the advantage was to be more with ourselves in developing our understandings of the readings."

"... Even though our team was able to complete the assignments and I was able to provide valuable contributions to the process, I disliked the lack of a team dynamic or harmony on our projects."

"We spent a lot of time in discussion threads and it was tough to collaborate. We would have saved a lot of time, if we could have talked in person or Skype."

"I found myself stressed; trying to find time to respond to discussion boards and be an active participant. I also was trying to be a good team member and regularly respond and read responses from my team mates."

Combination method

"... My learning experience has been a lot better (clearer). My team and I enjoy working and learning together. It has been a lot easier on all of us because we are all teachers with full time jobs and other classes."

"... I usually attempt to post information on a discussion board and then follow up with telephone, texts or chats. I like for people to have an opportunity to read through an assignment and sometimes trying to talk it out immediately doesn't work best for everyone."

"... I would say that my experience is substantially improved over having the limitations of synchronous and asynchronous only communication. Adding further, I felt significantly less frustrated with the material than I had with the previous restrictions."

"... This was my favorite so far. It is much easier to coordinate when it comes to team assignments. We can use the discussion space but also talk about it "live" which is the best of both worlds. There really weren't any challenges that I saw."

Archive of students' interaction during team work was further analyzed using Theory of Interaction and Performance (TIP) developed by McGrath (1991). McGrath (1991) states that successful groups always undertake three functions at the same time: (1) the first is working on a common task together (*production function*); (2) the second is achieving and facilitating a quality interaction and communication among group members (*group well-being*); (3) the third is providing effective help to the other members when needed (*member support*). Using TIP theory, archive of students' interactions were analyzed to evaluate their effectiveness (scale of 1 to 3 with 1= low; 2 = moderate and 3 = good) regarding task performance (defined by instructor's assessment of the quality of each team's written solution/response to the problem solving activity using a rubric) and group functioning (defined as (1) all group members interacted effectively with one another

(actively participated in creating, changing and reading or listening) and (2) each member took proper role and action and supported other members' ideas and contributions.

Analysis of teams' rating for the three functions showed that the quality of teams' products (written solution/response) differed across teams when different communication methods used (see Table 6). There was a significant difference in team's performance between asynchronous and synchronous method (M difference = -.661 (SD =7.23); $t(-4.75)$ (df = 26) $p<.00$) and synchronous and combination method (M difference =4.76 (SD =8.14); $t(3.04)$ (df = 26) $p<.005$). However, there was no significant difference between asynchronous and combination method, although overall, teams did better in combination method. In addition, comparison of 2011 teams' products with 2012 teams' products show that overall, 2011 teams performed better across all three methods. Analysis of group function (measured by the degree of members' participation in the discussion and the quality of their contributions) pointed to higher score in degree of participation during synchronous and combination methods, but higher quality of contributions by team members during asynchronous and combination method. In addition, there was more verbal evidence of member support during synchronous and combination method compared with the asynchronous method. It appeared that during the asynchronous method, teams' discussion was mainly focused on members' contributions to construction of the response, although there were some support messages. On the contrary, during synchronous discussion (in both synchronous and combination method), team members offered more quick thoughts and supported each other (e.g., agreed with each other) more often, although the content of their contributions were not the same quality compared with asynchronous discussion. In addition, it appeared that during synchronous method, teams' recorders tended to incorporate more members' comments in their formulation of the final responses (teams often used Google doc to formulate team's discussion) during synchronous method than they did during asynchronous method. Teams' responses often included more of the team's recorder's thoughts than individual members.

Table 6. Results of assessment of teams' solutions to problem solving activities

Team Problem Solving Activities	Teams' Average Scores (2011) M (SD)	Teams' Average Scores (2012) M (SD)	Average 2011 & 2012 N = 27	Combination of both Activities M (SD) (2011 & 2012)
Asynchronous Only	87.69 (5.25) (N= 13)	67.50 (8.49) (N = 14)	77.22 (12.43) (N = 27)	79.72 (9.72)
Activity 1 Activity 2	86.92 (5.96) (N = 13)	77.66 (6.42) (N = 14)	82.22 (7.64) (N = 27)	
Synchronous Only	91.92 (2.53) (N = 13)	85.71 (9.37) (N = 14)	88.70 (7.54) (N = 27)	86.33 (7.42)
Activity 3 Activity 4	88.08 (9.25) (N = 13)	82.29 (12.20) (N = 14)	85.07 (11.07) (N = 27)	
Combination	93.85 (2.19) (N = 13)	73.93 (18.62) (N = 14)	83.52 (16.69) (N = 27)	81.57 (12.82)
Activity 5 Activity 6	78.07 (15.35) (N = 13)	81.07 (12.43) (N = 14)	79.63 (13.72) (N = 27)	

For each module two quizzes assessed individual students' knowledge. Table 7 summarizes student performance in modules' quizzes. Students' average scores for modules' quizzes were consistent with teams' performance in problem solving activities. Overall, pairwise comparison of the average scores showed significant differences between synchronous and asynchronous methods (M difference =-24.2 (SD =13.30); $t(-9.28)$ (df = 25) $p<.00$), asynchronous and combination methods (M difference =-20.1 (SD =14.36); $t(-9.28)$ (df = 25) $p<.00$) and between synchronous and combination methods (M difference = 4.21 (SD = 6.93); $t(3.15)$ (df = 25) $p<.05$). Overall, 2011 students did better across all three methods, although the differences were not significant. In addition, students in both years consistently scored higher in quiz 2 of each module. This result might be because by the time students completed quiz 2 of each module, they had a much better understanding of the content. However, the lower scores for combination method compared with the synchronous method were somewhat surprising, given more opportunities that students had to clarify their understanding of the content. Further analysis of students' postings in the asynchronous class discussion before and after synchronous meeting during combination method indicated that before synchronous class discussion students tended to summarize their thoughts regarding readings and after the synchronous discussion only a few posted resources and confirmation of the previous thoughts. Thus, it did not appear that the discussion before and after synchronous

meeting had any impact on clarification of students' thoughts regarding the content, but provided more opportunities for sharing. However, students' posts in the discussion forum during asynchronous method were more focused on exploring examples and asking for more clarification of the content of the module. More data and deeper analysis is required to explore whether or not students' expectation of having access to asynchronous discussion forum impacted their concentration and attention during synchronous meeting, although in reality they did not take advantage of the asynchronous forum for more exploration and deeper understanding.

Table 7. Results of quizzes across three communication methods

Modules	Quizzes	Average Score 2011 M (SD)	Average Score 2012 M (SD)	Average Score Combined Quizzes (2011 & 2012)
Asynchronous Only (Week 1 & 2)	Quiz 1	54.67 (27.60) N = 12	57.43 (22.27) N = 12	61.23 (15.49)
	Quiz 2	77.37 (14.93) N = 14	56.81 (15.02) N = 14	
Synchronous Only (Week 3 & 4)	Quiz 3	50.94 (27.65) N = 12	62.50 (16.07) N = 13	85.78 (8.08)
	Quiz 4	70.08 (28.03) N = 12	54.08 (23.19) N = 12	
Mixed Method (Week 5 & 6)	Quiz 5	50.52 (30.51) N = 13	69.36 (18.33) N = 11	81.57 (12.83)
	Quiz 6	81.54 (20.87) N = 13	77.64 (19.32) N = 11	

CONCLUSION

The purpose of the study was to compare three communication methods (synchronous web-conferencing; asynchronous and a combined method of synchronous and asynchronous) while keeping learning strategies consistent across each method to find out how they influence learner self-regulation, social presence, satisfaction, interaction and learning process and outcomes, in small, interactive and collaborative online courses. The results suggested that factors other than communication methods maybe responsible for learner self-regulation. The students who participated in this study were graduate students with the majority being professionals who were either working in education or business and industry. Thus, the students' age, profession and personal interest may have played a major role in their motivation or self-regulation. However, as shown by the literature (e.g., Artino & Stephens, 2009; Dabbagh & Kitsantas, 2004; Delen, Liew & Willson, 2014; Lou & Macgregor, 2004; Oliver & Omari, 1999), it is also likely that strategies (e.g., small and large group interaction, collaboration, peer and instructor feedback and problem-solving activities) that were used to deliver instruction in this study supported regulating and sustaining students' motivation. In other words, although students entered the course with high level of motivation (self-regulation, self-control, intrinsic motivation and task value), they could have lost their motivation if learning strategies were not interactive and engaging. Future studies should control variables such as students' age, gender, experience, personal interest across various communication methods.

The study further revealed that there was a relationship between student satisfaction and perception of social presence and the three methods of communication for delivery of online learning environments. The synchronous and combination of asynchronous and synchronous methods of communication appeared to provide the highest level of social presence followed by the cognitive and emotional support. The results questioned the earlier research that suggested creating immediacy and intimacy (high social presence) in a computer-mediated, asynchronous communication method is challenging (e.g., Dennen, Darabi, & Smith, 2007; Ko, 2012; Thompson-Hayes, Gibson, Scott, Webb, 2009; Schutt, Allen, Laumakis, 2009). The study supports Sherblom's (2010) argument that five factors (medium and media richness, social presence, interaction, student's identity and relationship with the instructor and peers) may moderate the relationship of the computer-mediated communication in learning environments. The results shows that while creating immediacy and intimacy is much easier in the synchronous and combination method, it is likely that interactive and collaborative learning strategies, combined with the instructor's ability to utilize technology could have also resulted in cognitive and emotional connectedness. Learning environments that require learners to work collaboratively and on a real-world problem provide many opportunities for learners to build a community thus feel connected.

The findings of the study also indicated that while students appear to experience stronger feelings and higher levels of satisfaction in the combination method, the differences between the asynchronous and synchronous methods are hard to establish since each delivery method has attributes that are both limiting or enabling. In addition, as advised by other researchers (e.g., Fulford & Zhang, 1993; Clow, 1999; Phillips & Peters, 1999; Roblyer, 1999; Hacker & Wignall, 1997), it is likely that student satisfaction in the combination method is related to their perceived overall interactivity, rather than real measure of interaction and immediacy. Furthermore, the study also provided some evidence in support of an association between student learning styles (e.g., Allen, et al, 2013; Bray, Aoki & Dlugosh, 2008) and their satisfaction with the level of interaction, immediacy and collaboration offered by various communication methods. The students' preference for a combination of asynchronous and synchronous methods could be because the combination of these methods allows students to feel more in control of selecting a communication method that is matched with their personal preferences, situations, conditions, and opportunities. By combining environments, students are able to use a wider range of approaches to learn and interact with their peers and the instructor, thus benefit from current and more advanced technology.

The results of the study further highlight the limitations of the asynchronous communication method for building social and emotional connections and relationships and group interactions. The delayed feedback, difficulty in coordinating team members' interactions and providing a structured process for problem-solving activities, combined with a lack of emotional connection, created challenges for teams while solving problems during the asynchronous method. Conversely, during synchronous team meetings, members were able to intuitively provide a structured process that stimulated greater levels of participation among members, which led to converging members' divergent perspectives during team discussion and interaction. This more effective coordination process could have been accountable for teams' significantly better performance in problem solving during synchronous and combination methods. Consistent with the finding of the past research, this study shows that teams' interaction in the asynchronous method was less personal, more solution-oriented, less friendly and more efficient (Bordia, 1997; Massey, Montoya-Weiss & Hung, 2002). This more task-oriented discussion and collaboration could have created a less satisfying experience for team members, despite the quality of members' contributions during the asynchronous method. Other researchers have also shown the advantages of using the synchronous communication method as a richer medium of communication for building development of social/relational ties among members which ultimately could enrich team performance (e.g., Hrastinski, 2008; Park & Bonk, 2007; Moallem, 2003; Sherblom, 2010). Future research is needed to examine teams' collaboration process and their performance during synchronous and asynchronous communication methods to validate the above-mentioned challenges during problem solving tasks. This result has implications for instructors and designers of asynchronous online courses. Specific strategies should be developed for collaborative online problem solving when rich, synchronous media is not available.

In sum, the study supports the literature indicating that distance delivery, regardless of media or technology used, is not by itself a contributing variable in student achievement.

LIMITATIONS

This study was conducted in its real-life context to examine the phenomenon with all its complexities; thus, it was limited in its number of cases and participants. Additional research would be needed to verify whether its findings can be generalized. Another limitation of the study was that it occurred in a graduate course. As such, it is representative of a student body that is likely more motivated, self-regulated and more organized, and thus more likely to be successful in online learning. Future studies should look at various communication methods particularly new synchronous technologies and their impacts on undergraduate and less experienced population of students. Finally, while all attempts were made to create equally complex, ill-structured problem solving activities for each module, each module's instructional materials targeted different learning objectives which were addressed in its related problem solving activities.

REFERENCES

- Allen, M. I. K. E., Omori, K., Burrell, N., Mabry, E., & Timmerman, E. (2013). Satisfaction with distance education. *Handbook of Distance Education*, 143.
- Alessi, S.M. & Trollip, S.P. (2001). *Multimedia for learning: Methods and development*. Boston, MA; Allyn and Bacon.
- Arbaugh, J. B. (2001). How instructor immediacy behaviors affect student satisfaction and learning in web-based courses. *Business Communication Quarterly*, 64(4), 42-54.
- Argyle, M., & Dean, J. (1965). Eye contact, distance, and affiliation. *Sociometry*, 28, 289- 304.

- Baker, J. D. (2004). An investigation of relationships among instructor immediacy and affective and cognitive learning in the online classroom. *The Internet and Higher Education*, 7(1), 1-13.
- Bordia, P. (1997). Face-to-face versus computer-mediated communication: A synthesis of the experimental literature. *The Journal of Business Communication*, 34, 99-120.
- Artino, A. R., & Stephens, J. M. (2009). Beyond grades in online learning: Adaptive profiles of academic self-regulation among Naval Academy undergraduates. *Journal of Advanced Academics*, 20(4), 568-601.
- Baker, J. D. (2010). The Impact of Instructor Immediacy and Presence for Online Student Affective Learning, Cognition, and Motivation. *The Journal of Educators Online*, 7(1), 1-30.
- Barbour, M. K., McLaren, A., & Zhang, L. (2012). IT'S NOT THAT TOUGH: Students speak about their online learning experiences, *Turkish Online Journal of Distance Education-TOJDE*, 13 (2) Article 12. ISSN 1302-6488.
- Bray, E., Aoki, K., & Dlugosh, I. (2008). Predictors of learning satisfaction in Japanese online distance learners. *International Review of Research in Open and Distance Learning*, 9(3), 1-24.
- Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, 18(1), 32-42.
- Cavanaugh, C. (2005). Virtual Schooling: Effectiveness for Students and Implications for Teachers. In C. Crawford et al. (Eds.), *Proceedings of Society for Information Technology and Teacher Education International Conference* (301-308). Chesapeake, VA: AACE.
- Chen, Y. C., Pedersen, B., & Murphy, K. L. (2011). Learners' perceived information overload in online learning via computer-mediated communication. *Research in Learning Technology*, 19 (2), 101-116.
- Chiu, C. M., Hsu, M. H., Sun, S. Y., Lin, T. C. & Sun, P. C. (2005). Usability, quality, value and e-learning continuance decisions. *Computers & Education*, 45, 399-416.
- Clow, K. E. (1999). Interactive Distance Learning: Impact on student course evaluations, *Journal of Marketing Education*, 21(2), 97 - 105.
- Daft, R.L., & Wiginton, J. C. (1979). Language and organization. *Academy of Management Review*, 4, 179-191.
- Dal Bello, A., Knowlton, E., & Chaffin, J. (2007). Interactive Videoconferencing as a Medium for Special Education: Knowledge Acquisition in Preservice Teacher Education, *Intervention in School and Clinic*, 43 (1), 38-46.
- Dabbagh, N., & Kitsantas, A. (2004). Supporting self-regulation in student-centered Web-based learning environments. *International Journal on E-Learning*, 3, 40-47.
- Delen, E., Liew, J., & Willson, V (2014). Effects of interactivity and instructional scaffolding on learning: Self-regulation in online video-based environments, *Computers & Education*, 78, 312-320.
- Dennen, V. P., Darabi, A. A., & Smith, L. J. (2007). Instructor-Learner Interaction in Online Courses: The relative perceived importance of particular instructor actions on performance and satisfaction. *Distance Education*, 28(1), 65-79.
- Dennis, A.R. & Valacich, J.S. (1999). *Rethinking Media Richness: Towards a Theory of Media Synchronicity*. Paper presented at the 32nd Hawaii International Conference on System Sciences, Maui, Hawaii.
- Eom, S. B., Wen, H. J., & Ashill, N. (2006). The determinants of students' perceived learning outcomes and satisfaction in university online education: An empirical investigation. *Decision Sciences Journal of Innovative education*. 4(2), 215-235.
- Falloon, G. (2011). Making the connection: Moore's theory of transactional distance and its relevance to the use of a virtual classroom in postgraduate online teacher education. *Journal of Research in Technology Education (JRTE)*, 43(3), 187-209.
- Felder, R. M., & Soloman, B. A. (1998). *Index of learning styles*. Online version of the questionnaire available at North Carolina State University [<http://www2ncsu.edu/felder-public/ILSdir/ILSweb.html>].
- Fox, F. E., Morris, M., & Rumsey, N. (2007). Doing synchronous online focus groups with young people: methodological reflections, *Qualitative Health Research*, 17(4), 539-547
- Friend, B., & Johnston, S. (2005). Florida Virtual School: A choice for all students. In Z. L. Berge & T. Clark (Eds.), *Virtual schools: Planning for success* (pp. 97-117). New York: Teachers College Press.
- Fulford, C., & Zhang S. (1993). Perceptions of interaction: The critical predictor in distance education. *The American Journal of Distance Education*, 7(3), 8-21.
- Garrison, D. R., Anderson, T. & Archer, W. (2000). Critical theory in text-based environment: Computer conferencing in higher education, *The Internet and Higher Education*, 2(2-3), 87-105.
- Gosmire, D., Morrison, M., & Van Osdel, J. (2009). Perceptions of Interactions in Online Courses, *MERLOT Journal of Online Learning and Teaching*, 5(4), 609-617.
- Gunawardena, C.N. & Zittle, F.J. (1997). Social presence as a predictor of satisfaction within a computer-mediated conferencing environment. *The American Journal of Distance Education*, 11(3), 8-26.

- Hacker, K. L., and Wignall, D. I. (1997). Issues in predicting user acceptance of computer-mediated communication in inter-university classroom discussion as an alternative to face-to-face interaction, *Communication Reports*, 10(1), 108 – 114.
- Haefner, J. (2000). *Opinion: The importance of being synchronous. Academic.writing* . Retrieved Oct. 5, 2010 [http://wac.colostate.edu/aw/teaching/haefner2000.htm].
- Heinich, R., Molenda, M., & Russell, J. O. (1989). *Instructional media and the new technologies of instruction* (3rd ed.). New York: Macmillan Publishing Co.
- Hen, H., & Johnson, S. D. (2012). Relationship between Students' emotional intelligence, social bond, and interactions in online learning, *Educational Technology & Society*, 15(1), 78–89.
- Hrastinski, S. (2008). Asynchronous and synchronous e-Learning, *Educause Quarterly*, 31(4), 51-55.
- Irani, T. (1998). Communication potential, information richness and attitude: A study of computer mediated communication in the ALN classroom. *ALN Magazine*, 2(1).
- Jonassen, D. (2008). *Meaningful learning with technology*. Upper Saddle River, NJ: Pearson.
- Ko, C.-J. (2012). A case study of language learners' social presence in synchronous CMC. *ReCALL*, 24(2), 66-84.
- Lee, Y. K., Tseng, S. P., Liu, F. J. and Liu, S. C. (2007). Antecedents of learner satisfaction toward e-learning. *The Journal of American Academy of Business*, Cambridge, 11(2), 161-168.
- Lou, Y., & MacGregor, S.K. (2004). Enhancing project-based learning through Online between-group collaboration. *Educational Research and Evaluation*, 10(4-6), pp. 419-140.
- Massey, A. P., Montoya-Weiss, M., & Hung Y-T, C. (2002). Synchronizing pace in asynchronous global virtual project teams, Proceedings of 35th Hawaii International Conference on System Sciences.
- McAlister, G. (2001). Computer-mediated immediacy: A new construct in teacher-student communication for computer-mediated distance education (Doctoral dissertation, Regent University, 2001). *Dissertation Abstracts International*, 62, 2731.
- McBrien, J. L., Jones, P., & Cheng, R. (2009). Virtual spaces: Employing a synchronous online classroom to facilitate student engagement in online learning, *International Review of Research in Open and Distance Learning*, 10(3), 1-17.
- Merrill, M. D. (1975). Learner control: Beyond aptitude-treatment interactions. *AV Communications Re-view*, 23, 217-226.
- Miles, M.B., & Huberman, M.A. (1994). *Qualitative data analysis: An expanded sourcebook*. Thousands Oaks: CA: Sage Publications.
- Moallem, M. (2003). An interactive online course: A collaborative design model. *Educational Technology Research and Development*, 51(4), 85–103, ISSN 1042–1629.
- Moore, M. (1993). Theory for transactional distance. In D. Keegan (Ed.), *Theoretical principles of distance education* (pp. 22–38). London, New York: Routledge.
- Moore, M. G. (1989). Editorial: Three types of interaction. *American Journal of Distance Education*, 3(2), 1-7.
- Moore, M., & Kearsley, G. (1996). *Distance education a systems view*. Belmont, CA: Wadsworth.
- New York Times (July, 2012). Top Universities Test the Online Appeal of Free. Retrieved from http://www.nytimes.com/2012/07/18/education/top-universities-test-the-online-appeal-of-free.html?_r=0.
- Offir, B., Lev, Y. & Bezale, R. (2008). Surface and deep learning processes in distance education: Synchronous versus asynchronous systems. *Computers & Education*, 51, 1172-1183. Available online [www.sciencedirect.com].
- Oliver, R. & Omari. A. (2001). Exploring Student Responses to Collaborating and Learning in a Web-Based Environment. *Journal of Computer Assisted Learning*, 17(1), 34-47.
- Palloff, R. M., & Pratt, K. (1999). *Building learning communities in cyberspace*. San Francisco, CA: Jossey-Bass.
- Park, Y. J., & Bonk, C. J. (2007). Synchronous learning experiences: Distance and residential learners' perspectives in a blended graduate course, *Journal of Interactive Online Learning*, 6(3), 245-264.
- Pelowski, S., Frissell, L., Cabral, K., & Yu, T. (2005). So far but yet so close: Student chat room immediacy, learning, and performance in an online course. *Journal of Interactive Learning Research*, 16, 395-407.
- Phillips, M. R., and Peters, M. J. (1999). Targeting Rural Students with Distance Learning Courses: A comparative study of determinant attributes and satisfaction levels, *Journal of Education for Business*, 74(6), 351 – 356.
- Roblyer, M. D. (1999). Student motives for taking Internet-based courses at the high school and community college levels. *Journal of Research on Computing in Education*, 32(1), 157-171.
- Rourke, L., Anderson, T., Garrison, D. R., & Archer, W. (2001a). Assessing social presence in screen text-based computer conferencing. *Journal of Distance Education*, 14. Available online http://cade.athabascau.ca/vol14.2/rourke_et_al.html.

- Rourke, L., Anderson, T., Garrison, D.R., and Archer, W. (2001b). Assessing social presence in asynchronous text-based computer conferencing. *Journal of Distance Education*, 14(2).
- Schullo, S., Hilbelink, A., Venable, M., & Barron, A.E. (2007). Selecting a virtual classroom system: illuminate live vs. macromedia breeze (Adobe Acrobat Connect Professional). *Journal of Online Learning and Teaching* 3(4), 331-345.
- Shale, D., & Garrison, D. R. (1990). Introduction. In D.G.D.R. Shale (Ed.), *Education at a distance* (pp. 1-6). Malabar, FL: Robert E. Kriger.
- Sharma, D. (2006). Online technologies kill distance in learning: Managing participation in online journalism courses. *Journal of Creative Communications*, 1(75), 75–81.
- Sherblom, J. C. (2010). The computer-mediated communication (CMC) classroom: A challenge of medium, presence, interaction, identity, and relationship. *Communication Education*, 59, 497-523.
- Shi, S., & Morrow, B., V. (2006). E-Conferencing for instruction: What works? *EDUCAUSE Quarterly*, 29(4), 42-49.
- Schutt, M., Allen, B. S., & Laumakis, M. A. (2009). The effects of instructor immediacy behaviors in online learning environments. *Quarterly Review of Distance Education*, 10(2), 135-148.
- Skehan, P. & Foster, P. (2001). Cognition and tasks. In Robinson, P. (Ed.) *Cognition and second language instruction*. (pp. 183-205), Cambridge: Cambridge University Press.
- Skehan, P. (1998). *A cognitive approach to language learning*. Oxford: Oxford University Press.
- Tan, J. K. H., & Benbasat, I. (1990). Processing of graphical information: A decomposition of taxonomy to match data extraction tasks and graphical representations. *Information Systems Research*, 1(4), 416-439.
- Teng, D. C.E, Chen, N. S., Kinshuk, T. L. & Leo, T. (2012). Exploring students' learning experience in an international online research seminar in the Synchronous Cyber Classroom, *Computers & Education*, 58(3), 918-930.
- The Sloan Consortium (2013). *Grade Change: Tracking Online Education in the United States*. Babson Survey Research Group and Quahog Research Group, LLC. Retrieved from https://jfe.qualtrics.com/form/SV_9RG72TKFeL2mXA1.
- Thompson-Hayes, M., Gibson, D., Scott, A., & Webb, L. (2009). Professorial collaborations via CMC: Interactional dialectics. *Computers in Human Behavior*, 25, 208_216.
- Tractinsky, N., & Meyer, N. (1999). Chartjunk or goldgraph? Effects of presentation objectives and content desirability on information presentation. *MIS Quarterly*, 23(3), 397-420.
- USA TODAY (Nov. 2012). Online initiative to offer college courses for credit. Retrieved from <http://2u.com/semester-online/>
- Wang, Y., (2003) *Design and Evaluation a List Gathering Tool in a Web-based Collaborative Environment*, Ph.D. Dissertation, 2003, New Jersey Institute.
- White, B., & Frederiksen, J. (1990). Causal model progressions as a foundation for intelligent learning environments. *Artificial Intelligence*, 42, 99-157.
- Wild, M. (1996). Mental models and computer modeling. *Journal of Computer Assisted Learning*, 12(1), 10-21.
- Yang, Z., & Liu, Q. (2007). Research and development of Web-based virtual online classroom. *Computers & Education*, 48, 171–184.
- Yin R. (2014), *Case Study Research: Design and Methods*, 5th edition (first edition, 1984), Sage, Los Angeles.
- Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Zhang, S., & Fulford, C. P. (1994). Are interaction time and psychological interactivity the same thing in the distance learning television classroom? *Education Technology*, 34(6), 58-64.
- Zimmerman, B. & D. Schunk (2001) *Self-regulated learning and academic achievement: Theory, research, and practice* New York: Springer-Verlag.
- Zimmerman, B. (1990). Self-regulated learning and academic achievement: An overview. *Educational Psychologist*, 25, 3-17.
- Zirkin, B.G., & Sumler, D. E. (1995). Interactive or non-interactive? That is the question!!! An annotated bibliography. *Journal of Distance Education*, 10(1), 95-112.
- Zucker, A., & Kozma, R. (2003). *The virtual high school: Teaching generation V*. New York: Teachers College Press.

APPENDIX A

Results of intrinsic and extrinsic motivation

Intrinsic and Extrinsic Motivation	Pre-Interv M (SD) N 2011 2012	Asynch Only M (SD) N 2011 2012	Synch Only M (SD) N 2011 2012	Mix Method M (SD) N 2011 2012
Intrinsic				
1. In a class like this, I prefer course material that really challenges me so I can learn new things.	6.26 (.75) 14 6.16 (.80) 13	6.07 (.62) 14 5.82 (.98) 11	6.46 (.51) 13 5.70 1.06) 10	6.30 (.82) 10 5.75 (.97) 12
2. In a class like this, I prefer course material that arouses my curiosity, even if it is difficult to learn.	6.43 (.94) 14 5.92 (1.0) 13	6.43 (.51) 14 5.64 (.81) 11	6.39 (.77) 13 5.90 (1.10) 10	6.40 (.84) 10 5.83 (.94) 12
3. The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible.	6.43 (.94) 14 6.00 (1.0) 13	5.93 (.73) 14 5.55 (.93) 11	6.39 (.87) 13 5.60 (1.3) 10	6.30 (.68) 10 5.91 (.90) 12
4. When I have the opportunity in this class, I choose course assignments that I can learn from even if they don't guarantee a good grade.	6.00 (.96) 14 5.54 (.78) 13	5.86 (.77) 14 5.55 (.82) 11	5.69 (1.5) 13 5.80 (1.2) 10	5.60 (1.08) 10 5.75 (1.3) 12
Extrinsic				
5. Getting a good grade in this class is the most satisfying thing for me right now.	4.86 (1.2) 14 5.42 (1.00) 13	5.00 (.88) 14 5.55 (.82) 11	4.77 (1.4) 13 5.40 (1.1) 10	4.90 (1.4) 10 5.33 (1.2) 12
6. The most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting a good grade.	4.00 (1.7) 14 4.47 (1.3) 13	3.86 (1.7) 14 4.73 (1.2) 11	3.62 (1.4) 13 5.00 (1.1) 10	4.10 (1.4) 10 5.08 (1.0) 12
7. If I can, I want to get better grades in this class than most of the other students.	4.86 (1.7) 14 5.54 (1.3) 13	5.07 (1.0) 14 4.91 (1.5) 11	4.54 (1.5) 13 5.20 (.92) 10	4.70 (1.25) 10 5.42 (1.38) 12
8. I want to do well in this class because it is important to show my ability to family, friends, employer, or others.	5.79 (1.1) 14 5.15 (1.4) 13	5.29 (1.8) 14 5.18 (1.6) 11	4.78 (1.6) 13 5.30 (1.4) 10	5.10 (1.29) 10 5.25 (1.22) 12

Results of Task value

Task Value	Pre-Interv M (SD) N 2011 2012	Asynch Only M (SD) N 2011 2012	Synch Only M (SD) N 2011 2012	Mix Method M (SD) N 2011 2012
9. I think I will be able to use what I learn in this course in other courses.	6.70 (.63) 13 6.08 (.96) 13	6.93 (.27) 14 6.18 (.98) 11	6.77 (.44) 13 6.40 .97) 10	6.80 (.42) 10 6.00 (.95) 12
10. It is important for me to learn the course material in this class.	6.86 (.54) 14 6.31 (.86) 13	6.93 (.27) 14 6.18 (.87) 11	6.77 .60) 13 6.20 (1.0) 10	6.80 (.42) 10 6.08 (.90) 12
11. I am very interested in the content area of this course.	6.57 (.65) 14 5.92 (.86) 13	6.42 (.85) 14 5.81 (.75) 11	6.70 (.63) 13 5.80 (1.4) 10	6.60 (.70) 10 5.75 (1.1) 12
12. I think the course material in this class is useful for me to learn.	6.71 (.47) 14 6.16 (.99) 13	6.71 (.47) 14 6.10 (.83) 11	6.85 (.38) 13 5.90 (1.6) 10	6.90 (.32) 10 6.00 (.95) 12
13. I like the subject matter of this course.	6.43 (.51) 14 5.85 (.80) 13	6.21 (1.12) 14 5.73 (.79) 11	6.54 (.66) 13 5.60 (1.4) 10	6.50 (.70) 10 5.67 (.78) 12

Results of control of learning

Control of Learning	Pre-Interv M (SD) N 2011 2012	Asynch Only M (SD) N 2011 2012	Synch Only M (SD) N 2011 2012	Mix Method M (SD) N 2011 2012
14. If I study appropriate ways, then I will be able to learn the material in this course.	6.50 (.86) 14 6.15 (1.1) 13	6.07 (.73) 14 6.18 (.60) 11	6.23 (.73) 13 5.60 (1.2) 10	6.30 (.68) 10 5.42 ((1.1) 12
15. It is my own fault if I don't understand the material in this course.	5.71 (1.3) 14 5.54 (1.2) 13	5.64 (.75) 14 5.18 (.75) 11	5.69 (1.1) 13 4.90 (.99) 10	5.70 (.82) 10 5.33(1.1) 12
16 If I try hard enough, then I will understand the course material.	6.21 (1.1) 14 5.77 (1.2) 13*	5.92 (.91) 14 5.64 (.67) 11*	6.15 (.69) 13 5.00 (1.7) 10*	5.90 (.88) 10 5.50(1.2) 12
17. If I don't understand the course materials, it is because I didn't try hard enough.	5.92 (1.3) 14 5.46 (1.6) 13	5.14 (1.4) 14 5.27 (1.1) 11	4.92 (1.2) 12 5.00 (.82) 10	5.50 (.85) 10 5.50(1.0) 12

*Significant difference $p > .05$

Results of self-efficacy

Self-Efficacy	Pre-Interv M (SD) N 2011 2012	Asynch Only M (SD) N 2011 2012	Synch Only M (SD) N 2011 2012	Mix Method M (SD) N 2011 2012
19. I believe I will receive an excellent grade in this class	5.79 (.98) 14 6.16 (.80) 11	5.86 (.66) 14 5.73 (.91) 11	5.70 (.75) 13 5.50 (1.18) 10	5.50 (.71) 10 5.67 (.78) 12
20. I'm certain I can understand the most difficult material presented in the reading for this course	5.43 (1.0) 14 5.54 (1.3) 11	5.07 (1.1) 14 5.00 (1.2) 11	5.31 (1.1) 13 5.40 (.85) 10	5.30 (.95) 10 5.33 (1.3) 12
21. I'm confident I can understand the basic concepts taught in this course	6.72 (.47) 14 6.17 (.72) 11	6.79 (.43) 14 5.82 (.87) 11	6.54 (.66) 13 5.60 (1.4) 10	6.60 (.70) 10 5.92 (.90) 12
22. I'm confident I can understand the most complex material presented by the instructor in this course	5.50 (1.1) 14 5.42 (1.3) 11	5.14 (1.4) 14 5.09 (1.2) 12	5.62 (.96) 13 5.30 (.83) 10	5.30 (1.2) 10 5.42 (1.0) 12
23. I'm confident I can do an excellent job on the assignments and test in this course	5.93 (.73) 14 5.92 (1.1) 11	6.00 (.56) 14 5.55 (.69) 11	5.85 (.69) 13 5.40 (1.6) 10	5.70 (.68) 10 5.67 (.89) 12
24. I expect to do well in this class	6.29 (.61) 14 6.42 (.67) 11	6.36 (.63) 14 5.73 (.65) 11	5.92 (.50) 13 5.60 (1.4) 10	6.10 (.57) 10 6.00 (1.2) 12
25. I'm certain I can master the skills being taught in this class	6.14 (.95) 14 6.08 (.86) 11	5.86 (1.0) 14 5.73 (.47) 11	5.46 (1.1) 13 5.70 (.48) 10	5.66 (1.2) 10 5.42 (1.0) 12
26. Considering the difficulty of this course, the teacher, and my skills, I think I will do well in this class	6.14 (.77) 14 6.15 (.81) 11	6.21 (.43) 14 5.64 (.67) 11	6.00 (.71) 13 5.30 (1.3) 10	5.80 (.79) 10 5.67 (.99) 12

Results of self-regulation

Self-regulation	Pre-Interv M (SD) N 2011 2012	Asynch Only M (SD) N 2011 2012	Synch Only M (SD) N 2011 2012	Mix Method M (SD) N 2011 2012
27. During class time I often miss important points because I am thinking of other things	3.93 (1.7) 14 4.25 (1.4) 13	3.36 (1.7) 14 4.73 (1.2) 14	4.00 (1.6) 13 3.80 (1.2) 10	4.00 (1.4) 10 4.42 (1.2) 10
28. When reading for this course, I make up questions to help focus my reading	4.93 (1.5) 14 5.00 (1.4) 13	4.79 (1.4) 14 5.18 (.75) 11	4.77 (1.1) 13 5.11 (.78) 10	4.50 (1.4) 10 5.42 (1.4) 10
29. When I become confused about something I'm reading for this class, I go back and try to figure it out	6.36 (.63) 14 5.77 (1.0) 13	6.21 (.70) 14 5.55 (.82) 11	6.46 (.52) 13 5.60 (.97) 10	6.30 (.68) 10 5.58 (1.1) 10
30. If course materials are difficult to understand, I change the way I read the material	5.57 (.85) 14 5.39 (1.2) 13	5.14 (1.2) 14 5.36 (1.03) 11	5.15 (1.2) 13 5.30 (.95) 10	5.30 (1.5) 10 5.42 (1.1) 10
31. Before I study for new course material thoroughly, I often skim it to see how its organized	6.14 (.77) 14 5.85 (1.1) 13	5.79 (1.5) 14 5.64 (.81) 11	5.31 (1.6) 13 5.60 (.84) 10	5.80 (1.5) 10 5.83 (.58) 10
32. I ask myself questions to make sure I understand the material I have been studying in this class	5.36 (1.4) 14 5.39 (1.1) 13	5.43 (1.2) 14 5.27 (1.01) 11	5.85 (.80) 13 5.40 (1.1) 10	5.50 (1.1) 10 5.58 (1.1) 10
33. I try to change the way I study in order to fit the course requirements and the instructors teaching style	5.50 (1.0) 14 5.70 (.95) 13	5.21 (1.2) 14 5.73 (.65) 11	5.77 (.83) 13 5.30 (.95) 10	5.80 (.92) 10 5.58 (1.4) 10
34. I often find that I have been reading for class but don't know what it was all about	3.57 (1.7) 14 4.78 (2.0) 13	4.14 (1.6) 14 5.09 (1.38) 11	3.77 (1.4) 13 5.30 (1.1) 10	4.60 (1.5) 10 5.50 (1.1) 10
35. I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying	5.79 (1.3) 14 5.70 (1.0) 13	5.79 (.98) 14 5.27 (.90) 11	6.00 (.58) 13 5.50 (.97) 10	5.90 (.88) 10 5.75 (.87) 10
36. When studying for this course I try to determine which concepts I don't understand well	5.71 (.91) 14 5.62 (.96) 13	6.30 (.63) 13 5.73 (.79) 11	5.62 (1.1) 13 5.70 (.67) 10	5.70 (.82) 10 5.92 (.80) 10
37. When I study for this class, I set goals for myself in order to direct my activities in each study period.	5.64 (1.3) 14 5.85 (.90) 13	5.50 (1.4) 14 5.60 (.84) 11	5.85 (1.1) 13 5.60 (.84) 10	5.80 (1.0) 10 5.67 (.65) 10
38. If I get confused taking notes in this class, I make sure I sort it out afterward.	5.14 (1.8) 14 5.62 (1.3) 13	5.71 (1.4) 14 5.55 (.69) 11	5.92 (.64) 13 5.40 (.97) 10	6.10 (.74) 10 5.50 (.91) 10

Three Learning Potentials In Digital Games: Perception Of Malaysian University Teachers

Enas Noraddin
enoraddin@gmail.com

Abstract: This study aimed to investigate university teachers' perceptions of the potential benefits, or the lack of them, in digital games for learning and teaching in higher education institutions in Malaysia. The survey was conducted by emailing the questionnaire, to which 273 teachers responded online. The study sought to find answers to a fundamental question: How do university teachers in Malaysia view digital games as motivational, collaborative and instructional tools? Moreover, it looked into how do university teachers differ in their views about digital games by such variables as age, gender, academic discipline and other independent variables. The study undertook a descriptive analysis along with t-test and ANOVA to examine possible relationships between teachers' attitudes and their demographic information. The results showed a consistent pattern throughout where the majority of surveyed university teachers exhibited a favorable perception of the usage of digital games in higher education. It is noteworthy that the only variable that influenced such perception was the respondents' previous experience (or lack of it) in using digital game. The t-test and ANOVA results showed no relationships between respondents' demographic characteristics such as gender and age and favorable or unfavorable attitudes towards digital game usage in learning and teaching. Even though the majority of responding teachers had favorable attitude towards using digital games in their teaching, in practice fewer of them had used them for that purpose.

Keywords: Digital games; Game-based learning; higher education; teachers' perception; learning technologies; motivational; collaborative; instructional; ARCS.

INTRODUCTION

Examining the situation of learning and teaching in higher education revealed that there are needs for enhancements particularly in three areas, namely: students' motivation (Gale, 2011 ; Balduf, 2009 ; Baslanti, 2008), the collaborative learning environment (Pivec and Dziabenko, 2004 ; Howe & Strauss, 2003) and the conventional instruction methods (Gale, 2011; Baslanti, 2008; Monaco & Martin, 2007). Therefore, some educators, instructional designers and researchers have suggested computer/digital games as a medium for learning and teaching (Mysirlaki & Paraskeva, 2007; Akilli, 2007).

Moreno-Ger, Burgos, & Torrente (2009) asserted that "Games are powerful forces in technology-enhanced learning" (p.681). Johnson, Smith, Willis, Levine & Haywood, (2011) said digital games will have effective influences in higher education learning because they tend to make students build the 21 first century skills such as problem solving, critical thinking, decision making, collaboration and others. These skills are becoming important to be instilled on nowadays students (Sardone & Devlin-Scherer, 2010). Moreover, using digital games with university curriculum will help the students to have a deeper understanding of the knowledge taught (Johnson et al. ,2011). Johnson, with some optimism, expected that in two to three years the benefit of using digital games in education would be realized and lead to a wider acceptance and usage in teaching and learning.

Hwang & Wu (2012) support these predictions and reported that the number of studies about digital game-based learning has been increasing in the last 5 years. However, observing Hwang & Wu (2012) results of their review shows that there is a dearth of studies related to the use of digital games-based learning in Malaysia, the Middle East Arab countries, and generally speaking underdeveloped countries. Furthermore, the perception and attitude of higher education teachers in Malaysia and the Middle Eastern Arab countries about the uptake of digital game-based learning in education is limited.

This is particularly important because many studies indicated that digital games will reshape learning and teaching methods in higher education (Chen, Chen & Liu, 2010). Thus, the aim of this study is to elicit university teachers' perceptions and attitudes towards the use of digital games in colleges and universities in Malaysia to serve education from three angles: provoke students' motivation for learning; create collaborative environment and use digital games as new instruction means. And so, overall, the pertinent research question was specifically: How do university teachers view digital games as motivational, collaborative and instructional tools?

GAMES AS A MOTIVATIONAL TOOL

According to Ertzberger (2009) and Gale (2011), digital games can be the right tool to engage and motivate students in classroom. Prensky (2005) claims that digital-game based learning is a new means to motivate students. Becker (2007) saw an intersection between the traits of a digital game player and a motivated learner. According to Garris, Ahlers & Driskell (2002)

“Motivated learners are easy to describe. They are enthusiastic, focused, and engaged. They are interested in and enjoy what they are doing; they try hard, and they persist over time.” (p.444).

The description of a motivated learner is applicable to digital games player which made it justifiable to infer that digital games can motivate learners (Becker, 2007).

Huang & Chong (2009) conducted a study to explore the potential of games to motivate students in mathematics. The study revealed that students in a class with a digital game integrated into the classroom activities showed a significant improvement in motivation, achievement and attitude toward the subject in comparison with the class which had only a traditional learning environment. Moreover, it created a constructive learning environment that engaged students in activities that required discussions and conversations with one another.

Papastergiou (2009) suggested that digital games can be harnessed to create effective and motivational learning environment. The study confirmed an increase in the students' learning motivations. Furthermore, Digital game seemed to have given students greater enthusiasm to learn and greater amount of knowledge regardless of the student's gender. This is further discovered when Kirriemuir & McFarlane (2004) found that motivation is one of the key reasons of choosing to adopt digital games based learning; and that this motivation factor can also bring fun and academic achievements to learning.

With all these confirmations of the motivation contributions of digital games, yet, Lemke, Coughlin, & Reifsnider (2009) noted that the motivation aspect of digital games is just one among many other advantages.

DIGITAL GAMES AS COLLABORATION TOOL

Sandford and Francis (2006) contend that digital games can be an effective source of collaborative learning environment. In addition, according to Kirriemuir and McFarlane (2004) and Gale (2011), a growing body of research in the area of digital games pointed out that games were tools that facilitate activities that were part of collaborative learning such as social, communication and peer activities.

It is becoming important to create a collaborative learning environment for the students. Howe & Strauss (2003) justified why and stated that the current generation is team-oriented; and there are many reports that described the tendency of teens to be socializing in groups of more than two; which explains their enthusiasm and attraction to different kinds of social network mediums such as Facebook, YouTube, Twitter or MySpace. Therefore, Howe & Strauss (2003) recommend to teachers in higher education to start planning to meet students' expectation of finding collaborative learning environment such as group activities, collective assignments and projects.

Johnson et al., (2010) said that it was not difficult to integrate games that featured with collaborative playing such as massively multiplayer online (MMO) games to establish a collaborative learning space. Gale (2011) reported a study accomplished by Mansour and El-Said (2009) that created and integrated a multi-players role-playing educational game at University of Louisville. The study concluded that social interaction between students and their classmates improved and that

“Playing the game facilitated collaboration and communication among students which in turn enhanced their learning performance” (Mansour and El-Said ,2009, p.236. Cited by Gale, 2011).

Johnson et al., (2010) reported that digital games were not only useful for building a collaborative learning but they were also applicable to various learning contexts.

DIGITAL GAMES AS INSTRUCTIONAL TOOL

Digital games can be a very useful instructional tool (Sardone & Devlin-Scherer, 2010; Papastergiou, 2009). Gale (2011) predicted that using digital games in classroom or any part of the learning process, as an instructional tool, will become common in the future. In fact, Prensky (2005) contended that they were powerful instructional tools that must be used in learning and teaching. Blunt (2009) conducted a study on three different higher education courses as an attempt to discover the relation between digital game-based learning, learning processes and their results. The study found that students in all courses (male, female and different ethnic groups) who used digital games with traditional learning scored in the test significantly higher than students

(male, female and different ethnic groups) who did not use the game with traditional learning. However, different age-groups showed different results. Students with age 40 years and under who played games scored higher than students who aged 40 and above. Subject to further research confirmation, this could indicate that students who are not included in the “digital native” generation will not benefit from digital game-based learning and tend to prefer traditional means of learning.

McMichael (2007) found that games somehow enticed the students, with the teacher, to discuss, analyze and compare different topics and situations in history.

“Playing the games encouraged fruitful discussions about what drove change in a society, political upheaval, epidemic disease, religious expansion and turmoil, economic development, warfare” (p.214).

He further stated that utilizing games aligned to curriculum allowed the students to develop skills and enabled them to analyze questions related to certain topics.

These studies that showed positive results from utilizing digital games with universities courses provoked the researchers of this study to investigate where do university teachers in Malaysia stand in regard to using digital games with their teaching methods. The following section will show how the research was conducted and teachers’ perceptions were obtained, presented, and analyzed.

RESEARCH DESIGN

This study took a survey (cross sectional) research type since it is a suitable method to find out opinions and attitudes of a certain group of people about a particular area or issues (Fraenkel and Wallen, 2007). In fact, it is a very common method of behavioral investigation used in social research generally acceptable in principle with little or no contestable argument. The questionnaire used Likert with 5-point scale (1= strongly disagree, 5= strongly agree) because it is thought to be easier for respondents to answer than using the 7-point scale (O’Neil, 2007). The items in the questionnaire were adapted from previous surveys and other researchers’ statements such as Future Lab (2005); Beggs, O’Neill, Virapen, & Alexander, (2009); Ritzhaupt, Gunter, & Jones (2010) ; Johnson, Smith, Levine & Haywood (2010); Dziorny (2007) ; Chu (2009); de Freitas (2006); Felicia (2009) ; Johnson, Adams & Cummins, (2012).

The items in Table 1 explored if digital games can provide motivational factors according to the perceptions of our sample of university teachers. These items were used on the basis of the motivational design ARCS model (Huang, Diefes-Dux, Imbrie, Daku, & Kallimani, 2004; Huang, Huang, Diefes-Dux, & Imbrie, 2006 ; Kebritchi, Hirumi, and Bai, 2010). The reason for choosing ARCS model reflects the researchers’ agreement with Huang et al., (2006) statement that

“The ARCS motivational design model is widely applied when designing, developing and evaluating motivational strategies because of its applicability and practicability with instructional design processes” (p.245).

ARCS stand for attention, retention, confidence and satisfaction. Keller (1987) said that motivation can be provoked through these four factors. Therefore, each item in this group was mapped to ARCS components (Huang et al., 2004) below.

Table 3: DGBL as a Motivational Tool Items

Survey Items	ARCS factors	Resource
I believe that using digital games in teaching students help to maintain their attention and focus during the learning/playing session.	Attention	de Freitas (2006)
I feel that using digital games for learning and teaching gives students different educational experience from those given by traditional classroom instruction.	Relevance	de Freitas (2006); Johnson, Adams, and Cummins, (2012) and Johnson et al., (2010)
Using digital games based learning can increase self-esteem and confidence of students and make them independent learners.	Confidence	de Freitas (2006)
Digital games can bring fun and enjoyment to learning.	Satisfaction	Beggs et al., (2009)
I think using digital games for learning	ARCS	de Freitas (2006)

gives students an added motivation to study.

And likewise items in table 2 are used to generate the university teachers' positive or negative views about digital games as a collaborative factor supporting learning among students.

Table 4: DGBL as a Collaborative Tool

Survey Items	Resource
I feel that digital games based learning reinforces teamwork and collaboration.	Johnson, Adams, and Cummins, (2012) and Johnson et al., (2010)
I think using digital games in education can develop students' social negotiation skills.	
I believe some digital games allow learners to work together to solve problems collectively that could not be solved individually.	

Finally, statements in table 3 were used to generate the respondents' opinion about digital games potential as an instructional tool.

Table 5: DGBL as an Instructional Tool Items

Survey Items	Resource
I think with the use of digital games based learning students can learn from mistakes.	Felicia (2009)
Through digital games I can provide students with problems to solve that are related to the subject/topic to learn.	Johnson, Adams, and Cummins, (2012) and Johnson et al., (2010)
I consider digital games useful because they provide feedback to students during learning/playing session.	
In my opinion using digital games can put the learner in a simulated world environment where he/she can apply the concept that she/he has learnt.	de Freitas (2006)
I believe that using digital games with teaching and learning increases retention (students' ability to remember information and skills they have learnt) of a topic / subject.	Beggs et al., (2009)
I consider digital games as good revision tool.	

Besides using the attitudinal questionnaire items, several open-ended questions were designed to elicit behavior information of university surveyed teachers toward digital games. They also sought to discover if the teachers played digital games in their leisure time or used them with their teaching. These questions were also adapted from Future Lab (2005).

They were:

- (1) Do you play any kind of interactive (video) digital games?
- (2) How many times do you play a week?
- (3) "Thinking about computer games that are primarily designed for [learning (serious/edutainment games)] have you ever used them for educational purposes?" (P. 2)
- (4) Thinking about the kinds of computer games people play for entertainment, have you ever used any of these games as part of a lesson?

The survey also looked into demographic information such as the university teachers' age, gender and years of experience in teaching. Soliciting such information was important to examine if there is any association between the teacher's perceptions and attitudes and their demographic information. For instance, does age or genders of

responding teachers influence their perception and attitude? Or, if there is any relationship between having favorable attitude toward digital games and being young or old, male or female and so on.

POPULATION AND SAMPLE

The accessible population was five universities in Malaysia randomly selected. They are believed to be a good representative of Malaysian universities that consists of private and public (government-funded) universities. The sample of the study was randomly selected and included professors, associate professors, assistant professors, lecturers, assistant lecturers and tutors. Very few of the participants were approached face-to-face but the majority was approached through their emails addresses that were found in the staff directories of the selected universities websites.

The questionnaires were emailed to 1901 university teachers in different faculties and departments such as engineering, computing and informatics, management, multimedia, business and law, economics, mathematics, medicine, pharmacy, biotechnology, information science and technology, education, science, English literature, history and languages. Participation in the study was voluntary and anonymous which resulted in 273 (n=273) responses. According to Fraenkel and Wallen, (2007) a descriptive study should have a minimum of 100 participants as a sample size. This criterion is fulfilled by this descriptive study.

VALIDITY AND RELIABILITY

According to Kitchenham & Pflieger (2002), reusing questionnaire items from previous study can be beneficial because the existing instrument has already been evaluated for validity and reliability. Cronbach’s Coefficient Alpha test was used to check the internal reliability and consistency of the questionnaire. According to Lim, Khine , Hew, Wong, Shanti and Lim (2003) Cronbach's alpha is considered one of the widely used internal consistency reliability methods. And for an instrument to be judged as internally consistent it has to achieve an alpha above .60 (DeVellis, 1991 cited by Lim et al., 2003). This study achieved an overall alpha of 0.885; and so the reliability is deemed acceptable.

RESULTS AND DISCUSSION

DEMOGRAPHIC DATA

The participants who responded to the survey included 50.9% males (N=139) and 49.1% female (N=134). The majority of them are between the ages of 31-35 (28.2%), which indicates that the participants tend to represent the so-called “games generation” according to Prensky’s (2001) statement’s that those who are over 39 could not be from the games generation.

Table 4 : Age-group of the Participated Teachers

31-35 years old	36-40 years old	41-49 years old	50 and above years old
28.2%	20.9%	25.3%	9.5%

By highest degree attainment, doctorate holders (51.3%) are in a slight majority over master’s holders (44.3%) as the following table indicates:

Table 5: Highest Degree Attainment by Surveyed Teachers

Doctorate degree	Master’s degree	Bachelor’s degree	Specialist degree
51.3%	44.3%	2.9%	1.5%

Furthermore, the surveyed teachers have wide-ranging years of services as indicated in table 6.

Table 6: Years of Teaching Experience

1 - 5 years	6-10 yeas	11 -15 years	More than 15 years
-------------	-----------	--------------	--------------------

30.8%	28.2 %	18.7%	22.3%
-------	--------	-------	-------

About (41%) of the surveyed teachers have more than 11 years of teaching experience, while about (30.8%) have 5 years of teaching experience or less. Generally speaking, the surveyed teachers have enough teaching experience to give an informed opinion about the research questions, specifically the benefits of using digital games in the learning and teaching contexts. And when this is considered with the teachers' habit of playing games or not playing them, the final conclusion regarding their opinions can be considered informed.

Table 7: Percentage of Teachers Playing Digital Games

Played digital games	Didn't play
56.0%	44.0%

More than half of the teachers do play digital games, but slightly less than half don't seem to care for the same.

Those playing digital games show different frequencies of playing according to the following data.

Table 8: Teachers' Frequency of Playing

Once a week	2-3 times a week	Play 4- 6 times per week
58.2%	5.9%	12.1 %

It is evident that half of the players enjoy their hobby only once a week, while some 18% show more enthusiasm by playing between two 2 to 6 times a week.

However, more than 70% of surveyed university teachers have not used commercial or serious digital games as part of their teaching methods

Table 9: Teachers Using Digital Games in Classroom

Game Category	No	Yes
Entertainment Games	77%	22.3 %
Serious/Edutainment Games	74.7 %	25.3%

The above data raises a question: do the surveyed universities teachers in Malaysia have doubts in the benefits of using digital games in education system as motivational, collaborative and instructional tool? The following discussion will attempt to answer this question and explain the relevant reasons.

TEACHERS' ATTITUDES TOWARDS USING DIGITAL GAMES

Table 10 below shows that the surveyed university teachers in Malaysia support Beedle & Wright (2007) opinion; and they believe that digital games can boost up students motivation because they provide fun elements, richer learning experience and sustain students' attention to the lesson. In short using digital games used as part of learning and teaching has the potential to fulfill the requirements in the ARCS motivational model.

Table 10: Means and Standard Deviations of Teachers' Attitudes towards Digital Games

Construct	Survey Items	Mean	SD	p%
Motivation	I believe that using digital games in teaching helps students to maintain their attention and focus during the learning/playing session.	3.72	.897	72.2
	I think using digital games for learning gives students an added motivation to study.	3.81	.858	75.1
	Using digital games based learning can increase self-esteem and confidence of students and make them independent learners.	3.44	.930	55.4
	I feel that using digital games for learning and teaching gives students different educational experience from those given by traditional classroom instruction.	3.99	.779	86.8
	Digital games can bring fun and enjoyment to learning.	4.04	.724	89.0
Collaboration	I feel that digital games based learning reinforces teamwork and collaboration.	3.55	.903	62.3
	I think using digital games in education can develop students' social negotiation skills.	3.41	1.000	57.2
	I believe some digital games allow learners to work together to solve problems collectively that could not be solved individually.	3.75	.830	72.5
Instruction	I think with the use of digital games based learning students can learn from mistakes.	3.66	.847	69.6
	Through digital games I can provide students with problems to solve that are related to the subject/topic to learn.	3.74	.851	71.4
	I consider digital games useful because they provide feedback to students during learning/playing session.	3.72	.816	72.2
	In my opinion using digital games can put the learner in a simulated world environment where he/she can apply the concept that she/he has learnt.	3.80	.821	78.4
	I believe that using digital games with teaching and learning increases retention (students' ability to remember information and skills they have learnt) of a topic / subject.	3.74	.847	71
	I consider digital games as good revision tool.	3.67	.927	70.7

Moreover, the study reveals that the majority of university teachers in Malaysia also agree with Johnson, Adams, and Cummins, (2012) and Johnson et al., (2010) and think of digital games as a powerful tool to build a collaborative learning environment.

The last part of the study evaluated if digital games are viewed suitable to be used as an instructional tool to support learning; and according to (Table 10) more than (50%) agree with Felicia (2009); Johnson, Adams, and Cummins, (2012); Johnson et al., (2010); de Freitas (2006) and Beggs et al., (2009) agree that digital games have what are needed to be used as instructional tools because they provide feedback to students and experiential learning as well as strengthen the students' retention and develop their problem solving skills.

Finding that teachers strongly support digital games based learning, triggered the importance of finding whether their views were influenced by any demographic variables. But, it was found through t-test and ANOVA that the gender or age had no influence on the teachers' point of view as (Table 11) shows.

Table 11: T-Test for Teachers' Attitudes by their Gender

Constructs	Male (N=139)		Female (N=134)		T	P-value
	Mean	SD	Mean	SD		
Collaborative tool	3.5755	.77377	3.5597	.83231	0.163	.871
Motivation tool	3.8115	.66497	3.7881	.71955	0.280	.780
Instructional tool	3.7290	.69686	3.7139	.74441	0.173	.863

However, the study discovered that the experience (or lack of it) of employing games in learning had played a part in forming teachers' perceptions (Table 12, Table 13).

Table 12: T-test Results for Teachers' Attitudes towards Digital Games and Previous Experience of Integrating Entertainment Games in Classroom

Thinking about the kinds of computer games people play for entertainment, have you ever used any of these games as part of a lesson?	Yes (N= 61)		No (N= 212)		T	P-value
	Mean	SD	Mean	SD		
Collaborative tool	3.8470	.77118	3.4874	.79383	3.137	.002*
Motivation tool	3.9869	.74464	3.7462	.66713	2.418	.016*
Instructional tool	3.8852	.81680	3.6745	.68359	2.028	.044*

Note: P < 0.05.

Table 13: T-test Result for Teachers' Attitudes towards the Digital Games and Previous Experience Integrating Educational Digital Games in Classroom

Thinking about computer games that are primarily designed for learning (serious/edutainment games), have you ever used them for educational purposes?	Yes (N= 69)		No (N= 204)		T	P-value
	Mean	SD	Mean	SD		
Collaborative tool	3.7778	.81783	3.4967	.78540	2.543	0.012*
Motivation tool	3.9797	.75704	3.7392	.65828	2.523	0.012*
Instructional tool	3.8913	.79871	3.6642	.68299	2.284	0.023*

Note: P < 0.05.

The above statistical analysis shows an association between the influence of having an experience of using digital games in classroom and having favorable attitude toward using them in teaching for motivating the students, creating collaborative learning environment and being used as an instructional tool.

LIMITATIONS

The major limitation that may have constrained the study is time and resources. With more time and resources, the sample size could have been extended to cover a larger number of respondents at universities and colleges throughout Malaysia, instead of relying on responses from 5 universities. And with anonymity to be maintained, follow-up with non-responding participants could not be carried out. Short of time and cost did not allow the researcher to seek additional methods of data collection such as interviews which could have made added strength to the data collected through the survey questionnaire. Furthermore, technical problems related to emailing process had to be tackled.

CONCLUSION

Utilizing new IT and communication technologies in higher education is very important to enhance learning for the benefit of today's students, or the "digital natives" (Prensky, 2001, 2005), who are not only adept to such technologies but spend considerable time on them getting entertainment and knowledge. Digital games for learning are one of these technologies that researchers around the world are increasingly becoming interested to see them in prevalent use by the education systems of all levels, from kindergarten to university.

But intent of such adoption must begin with understanding the teachers' thinking about digital games; and so the basic question would be: What is the perception and attitude of teachers towards digital games? In another word, would they be for or against the idea of introducing digital games in their classrooms and how do university teachers in Malaysia differ in their views about digital games potentials by such variables as age, gender, academic discipline and others sets of independent variables?. In Malaysia, this fundamental issue has not been researched adequately and so this study was carried out to explore it through a questionnaire survey.

This study found that the surveyed university teachers in Malaysia have positive attitude towards using digital games as a motivational, an instructional and a collaboration tools with teaching and learning in higher education. This positive attitude suggests that teachers are supposedly willing to start integrating and utilizing digital game in their teaching efforts.

The findings and the results of this study can be a starting point to any future research related to the usages of digital games in higher education in Malaysia. For instance, this study shows that the teachers have positive attitudes towards digital games, yet very few have used digital games in their teaching. Why? There are barriers and that is the critical issue hindering the integration of digital games into classroom teaching and learning at higher educational institutions in Malaysia.

REFERENCES

- Akilli, G. K. (2007). Games and simulations: A new approach to education? In D. Gibson, C. Aldrich, & M. Prensky, *Games and simulations in online learning: Research and development frameworks* (pp. 1-20). Hershey, PA: Information Science Publishing.
- Balduf, M. (2009). Underachievement among college students. *Journal of Advanced Academics*, 20(2), 274-294. Retrieved October 2012, from <http://www.usu.edu/arc/StudySmart/pdf/UnderachievementAmongCollegeStudents.pdf>.
- Baslanti, U. (2008). Investigating the underachievement of university Students in Turkey. Exploring Subscales. *International Journal Of Progressive Education*, 4(2), 40-56. Retrieved October 2012, from <http://www.eric.ed.gov/PDFS/ED501580.pdf>
- Becker, K. (2007). Pedagogy in commercial video games. In D. Gibson, C. Aldrich, & M. Prensky, *Games and Simulations in Online Learning: Research and Development Frameworks* (pp. 21-47). USA: Information Science Publishing.
- Beedle, J. B., & Wright, V. H. (2007). Chapter VII: Perspectives from Multiplayer Video Gamers. In D. Gibson, C. Aldrich, & M. Prensky, *Games and Simulations in Online Learning: Research and Development Frameworks* (pp. 150-174). USA: Information Science Publishing.
- Beggs, R., O'Neill, P., Virapen, K., & Alexander, S. (2009). The Perception of Gaming in Higher Education: Gaming Habits of University of Ulster Staff. *IEEE Computer society*, 174-177. Retrieved from http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5116569.
- Blunt, R. (2009). Do serious games work? Results from three studies. Retrieved from http://patrickdunn.squarespace.com/storage/blunt_game_studies.pdf.
- Chen, L., Chen, T. L., & Liu, H. J. (2010). Perception of young adults on online games: Implications for higher education. *The Turkish Online Journal Educational Technology*, 9(3), 76-84. Retrieved from <http://www.tojet.net/volumes/v9i3.pdf#page=83>
- Chu, S. (2009). Digital Game-Based Learning in Higher Education. In M. Khosrow-Pour, *Encyclopedia of Information Science and Technology, Second Edition* (pp. 1120-1124). doi:10.4018/978-1-60566-026-4.ch178
- de Freitas, S. I. (2006). Using games and simulations for supporting learning. *Learning, Media and Technology*, 31(4), 343-358. Retrieved from <http://dx.doi.org/10.1080/17439880601021967>

- Dziorny, M. (2007). Digital Game-based Learning and dyslexia in higher education. *Carlson Proceedings of Society for Information Technology & Teacher Education International Conference* (pp. 1189-1197). Chesapeake, VA.: AACE. Retrieved from <http://www.editlib.org/p/24720>
- Ertzberger, J. (2009). An Exploration of Factors Affecting Teachers' Use of Video Games as Instructional Tools. In I. Gibson et al. (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2009*, pp.1825-1831. Chesapeake, VA:AACE. Available : <http://www.editlib.org/p/30884>.
- Felicia, P. (2009). Digital games in schools:A handbook for teachers. *Belgium: European Schoolnet*. Retrieved from http://games.eun.org/upload/gis_handbook_en.pdf.
- Fraenkel, J. R., & Wallen, N. E. (2007). *How to design and evaluate research in education (6th ed.)*. McGraw-Hill international edition.
- Future Lab. (2005). *Teaching with games: Survey on teachers' attitudes to games and learning*. Retrieved from http://www.futurelab.org.uk/resources/documents/project_reports/teachin_with_games/TWG_teachers_survey.pdf
- Gale, M. (2011). *Gameplay in Higher Education: The Use of Serious Games vs Traditional Instructional Methods in Learning*. Ph.D. dissertation, Auburn University, United States -- Alabama. Available: ProQuest Dissertations & Theses(UMI No. 3464449).
- Garris, R., Ahlers, R., & Driskell, J. E. (2002). Games, motivation, and learning: A research and practice model. *Simulation & Gaming*, 33(4), 441-467. Retrieved from http://diegolevis.com.ar/secciones/Infoteca/vj_motivacion.pdf
- Halverson, R.(2005). What can K-12 school leaders learn from video games and gaming? [online], *Innovate* 1 (6). Available: <http://www.innovateonline.info/index.php?view=article&id=81>.
- Howe, N., & Strauss, W. (2003). Millennials Go to College-Executive Summary. *American Association of Collegiate Registrars and Life Course Associates*. Retrieved from <http://eubie.com/millennials.pdf>
- Huang, K. H., & Chong, J. K. (2009). Integrating Computer Games with Mathematics Instruction in Elementary School- An Analysis of Motivation, Achievement, and Pupil-Teacher Interactions. *Achieve World Academy of Science, Engineering and Technology*. Retrieved from <http://www.waset.org/journals/waset/v60/v60-44.pdf>
- Huang, W., Diefes-Dux, H., HImbrie, P. K., Daku, B., & Kallimani, J. G. (2004). Learning motivation evaluation for a computer-based instructional tutorial using ARCS model of motivational design. *34th Annual Frontiers in Education 2004 FIE 2004*, 65-71. Retrieved from <http://ieeexplore.ieee.org/lpdocs/epic03/wrapper.htm?arnumber=1408466>
- Huang, W., Huang, W., Diefes-Dux, H., & Imbrie, P. (2006). A preliminary validation of Attention, Relevance, Confidence and Satisfaction model-based Instructional Material Motivational Survey in a computer-based tutorial setting. *British Journal of Ed*, 37, 243-259. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-8535.2005.00582.x/pdf>
- Hwang, G. J., & Wu, P. H. (2012). Advancements and trends in digital game-based learning research: a review of publications in selected journals from 2001 to 2010. *British Journal of Educational Technology*, 43, E6-E10. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-8535.2011.01242.x/abstract>
- Johnson, L., Smith, R., Willis, H., Levine, A., & Haywood, K. (2011). *The 2011 Horizon Report*. Austin, Texas: The New Media Consortium. Retrieved from <http://net.educause.edu/ir/library/pdf/HR2011.pdf>
- Johnson, L., Adams, S., & Cummins, M. (2012). *The NMC Horizon Report: 2012 Higher Education Edition*. Austin, Texas: The New Media Consortium. Retrieved from Available: <http://www.nmc.org/publications/horizon-report-2012-higher-ed-edition>
- Johnson, L., Smith, R., Levine, A., & Haywood, K. (2010). *2010 Horizon Report: K-12 Edition*. Austin, Texas: The New Media Consortium. Retrieved from <http://www.nmc.org/pdf/2010-Horizon-Report-K12.pdf>

- Kebritchi, M., Hirumi, A., & Bai, H. (2010). The effects of modern mathematics computer games on mathematics achievement and class motivation. *55*(2), 427-443. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0360131510000412>
- Keller, J. M. (1987). Development and use of the ARCS model of motivational design. *Journal of Instructional Development*, *10*(3), 2 – 10. Retrieved from <http://link.springer.com/article/10.1007%2F02905780?LI=true>.
- Kirriemuir, J., & McFarlane, A. (2004). *Report8: Literature Review in Games and learning*. Futurelab. Retrieved from http://www.futurelab.org.uk/resources/publications_reports_articles/literature_reviews/Literature_Review378
- Kitchenham, B. A., & Pfleeger, S. L. (2002). Principles of survey research: part 3: constructing a survey instrument. *ACM SIGSOFT Software Engineering Notes*, *27*(2). Retrieved from <http://dl.acm.org/citation.cfm?id=511155>
- Lee, Y. (2009). The relationships among motivation, learning style preferences, and perceptions in the use of video games and language learning for Taiwanese college students. Ed.D. dissertation, The University of Memphis, United States -- Tennessee. Available: ProQuest Dissertations & Theses (UMI No. 3370271).
- Lemke, C., Coughlin, E., & Reifsnieder, D. (2009). Technology in schools: What the research says: An update. *Culver City, CA: Commissioned by Cisco*. Retrieved from http://www.cisco.com/web/strategy/docs/education/tech_in_schools_what_research_says.pdf
- Lim, C. P., Khine, M. S., Hew, T., Wong, P., Shanti, D., & Lim, B. (2003). Exploring critical aspects of information technologies integration in Singapore schools. *Australian Journal of Educational Technology*, *19*(1), 1-24. Retrieved from <http://www.ascilite.org.au/ajet/ajet19/lim.html>
- McMichael, A. (2007). PC Games and the Teaching of History. *The History Teacher*, *40*(2). Retrieved from <http://www.historycooperative.org/journals/ht/40.2/mcmichael.html>
- Monaco, M., & Martin, M. (2007). The millennial student: A new generation of learners. *Athletic Training Education Journal*, *2*, 42-46. Retrieved from <http://www.nataej.org/2.2/EJMonaco.pdf>
- Moreno-Ger, P., Burgos, D., & Torrente, J. (2009). Digital Games in eLearning Environments: Current Uses and Emerging Trends. *Simulation & Gaming*, *40*(5), 669-687. Retrieved from <http://sag.sagepub.com/cgi/doi/10.1177/1046878109340294>.
- Mysirlaki, S., & Paraskeva, F. (2007). "Digital games: Developing the Issues of Socio-cognitive Learning Theory in an Attempt to Shift an Entertainment Gadget to an Educational Tool," Digital Game and Intelligent Toy Enhanced Learning, DIGITEL '07. *The First IEEE International Workshop*, 147-151. doi:10.1109/DIGITEL.2007.18/ 9465047
- O'Neil, G. (2007). Likert scale & surveys – best practices. Intelligent Measurement. Retrieved from Available:<http://intelligentmeasurement.wordpress.com/2007/11/20/likert-scale-surveys-best-practices/>.
- Papastergiou, M. (2009). Digital game-based learning in high school computer science education: Impact on educational effectiveness and student motivation. *Computers & Education*, *52*(1), 1-12. Retrieved from <http://www.sciencedirect.com/science/article>
- Pivec, M., & Dziabenko, O. (2004). Game-Based Learning in Universities and Lifelong Learning: "UniGame: Social Skills and Knowledge Training" Game Concept. *J.UCS*, *10*(1), 4-16. Retrieved from http://www.jucs.org/jucs_10_1/game_based_learning_in
- Prensky, M. (2001). *Digital Game-Based Learning*. New York: McGraw.
- Prensky, M. (2005). Computer games and learning: Digital game-based learning. In J. Raessens, & J. Goldstein, *Handbook of Computer Game Studies* (pp. 97-122). Cambridge, MA: The MIT Press.

- Ritzhaupt, A. D., Gunter, E., & Jones, G. (2010). Survey of Commercial off-the-shelf Video Games: Benefits and Barriers in Formal Educational Settings. *International Journal of Instructional Technology and Distance Learning*. Retrieved from http://www.itdl.org/Journal/May_10/article04.htm.
- Sandford, R., & Francis, R. (2006). Towards a theory of a Games-based Pedagogy. *JISC Innovating e-Learning practice: The proceedings of Theme 3 of the JISC online conference*. Retrieved from http://www.jisc.ac.uk/media/documents/programmes/elearningpedagogy/ebook_theme3_a4.pdf.
- Sardone, N. B., & Devlin-Scherer, R. (2010). Teacher Candidate Responses to Digital Games: 21st-Century Skills Development. *Journal of Research on Technology in Education*, 42(4), 409-425. Retrieved from http://www.eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_ERICExtSearch_SearchValue_0=EJ895055&ERICExtSearch_SearchType_0=no&accno=EJ895055

Virtual Collaboration: A Phenomenological Study Of Remote Online Adjuncts Virtual Collaboration Lived Experiences

Dr. Lori Schieffer, Ed.D.
lorisch@yahoo.com

Abstract: Online education is rapidly growing in higher education. This has left colleges needing to hire more part-time remote adjuncts to fill the fluctuating number of available courses. Because remote online adjuncts are susceptible to isolation, the need has arisen to study the benefits and barriers of virtual collaboration. The purpose of this phenomenological qualitative study was to examine the virtual collaboration lived experiences of remote online adjuncts. The study helped unveil the motives and lived experiences of virtual collaboration among online adjuncts. The composite description revealed nine themes about how participants experience virtual collaboration. The study suggests that higher education leaders would be well served to focus their efforts on leadership that will promote virtual collaboration practices. It is advisable that higher education leaders look for ways to provide leadership to connect collaborators, create opportunities for collaboration, and define clear roles for virtual collaboration. Remote online adjuncts may find camaraderie, social connections, an opportunity to participate in scholarship, a chance for self-reflection, and develop a sense of pride through virtual collaboration. Barriers that must be overcome for virtual collaboration included trust, a lack of time, and a feeling of pressure to participate.

INTRODUCTION

Although hiring adjunct faculty to teach online classes is commonplace in institutions of higher education, less common is a clear understanding of how adjunct faculty collaborate with their peers once they start teaching online (Wolf, 2006). Many institutions of higher education offer online classes and turn to adjuncts to help teach them (Allen & Seaman, 2010). Changing enrollment numbers for online universities have increased the number of adjuncts needed to fill online teaching positions. Over the past five years, students taking online classes increased 10 times faster than traditional enrollments, and 31% of all higher education students take at least one college class via the Internet (Allen & Seaman, 2010). As adjuncts fill these teaching vacancies, many do not have an understanding of how to virtually collaborate with their peers (Wolf, 2006). Developments, such as, new advancements in pedagogy and frequent changes in technology may have caused online adjuncts to face challenges because of their physical removal from the campus (Shattuck et al., 2011). The increased distance may lead to the remote online adjunct feeling isolated because of the lack of communication or support from other instructors. In a traditional campus setting, adjuncts have the opportunity to collaborate with colleagues face-to-face (Shattuck et al., 2011), however when adjuncts are offsite or remote, face-to-face collaboration with peers is not feasible (McLean, 2006). The distance between online remote adjuncts creates a need to find other solutions for remote online adjuncts to collaborate.

Virtual collaboration is one approach for remote online adjuncts to interact with peers, as the use of the Internet for collaboration removes the barrier of distance (McLean, 2006). Virtual collaboration is a process for working with others to create a product, to examine professional practices, or to discuss topics via the Internet (Puzziferro-Schnitzer, 2005). Though virtual collaboration could offer a viable option to interact with other adjuncts, a gap exists in how institutions of higher education and adjuncts approach the process. Although many institutions who hire remote online adjuncts realize the need for collaboration, it is unclear the best way to support these faculty members (Kudaravalli & Faraj, 2008). The lack of knowledge about virtual collaboration practices may lead to confusion.

Possessing a clear understanding of how remote online adjunct faculty collaborate virtually could provide higher education administrators with a better understanding of how to foster these practices. By understanding the remote adjunct faculties' lived experiences, administrators and adjuncts who teach online can learn the strengths and weaknesses of virtual collaboration. As adjuncts teach online from remote locations, the need to understand virtual collaborative lived experiences of this population becomes more important (McLean, 2006).

LITERATURE REVIEW

The changes in hiring practices of remote online adjuncts created a new and unfamiliar situation in higher education. Online instruction is a new practice for many higher education faculty. As more institutions of higher education move toward online learning, the question of how to foster collaboration arises.

The reasons for faculty collaboration in higher education differ. Austin and Baldwin (1991) stated that collaboration in higher education occurs in two ways: teaching and research. According to Austin and Baldwin, higher education faculty collaborate by conducting research, writing, and partnering in teaching. Collaboration also encourages faculty to think beyond the narrow borders of their classrooms by incorporating diverse teaching strategies, sharing knowledge, and communicating with peers (Stevenson et al., 2005). Definitions of virtual collaboration differ throughout the literature. Coughlin and Kadjer (2009) offered one definition of virtual collaboration as process that uses a variety of methods for professionals to work together, pool resources, communicate, and share ideas, fostering opportunities for self-development. Virtual collaboration may take place via e-mail, online faculty forums, virtual learning communities, online mailing lists, and other forms of communication facilitated by technology.

The lack of current research limits the development of knowledge about both commonalities and differences in how online remote adjuncts use virtual collaboration. Without a model, remote online faculty cannot gain a clear understanding of virtual collaboration practices. Researchers (Allen & Seaman, 2010; Kudaravalli & Faraj, 2008; Shattuck et al., 2011) suggested that professional development opportunities focusing on helping remote online adjuncts become familiar with online teaching skills may not be widely available. To help both remote online adjuncts and higher education administration develop future virtual collaboration practices, an awareness of current virtual collaboration lived experiences must exist. A model of virtual collaboration practices provides a framework for remote online adjuncts to follow.

ONLINE EDUCATION TRENDS

The literature review indicates enrollments for online education have risen in the past 10 years (Allen & Seaman, 2010; Coughlin & Kadjer 2009; McCarthy & Samors, 2009; McLean, 2006; US Department of Education, 2010). According to Allen and Seaman, in the United States 73% of institutions of higher education reported more demand for existing online courses and programs. Institutions of higher education showed 74% of reporting public institutions rated online education as critical to their long-term strategy. Shea (2007) found that trends of online enrollment have changed and more than three million students enrolled in online courses in 2007.

The Center for Community College Student Engagement (2010), a research and service initiative, found that 67% of community college faculty members across the United States were adjuncts. Many of these adjuncts have full-time day jobs or simultaneously teach for several universities (Puzziferro-Schnitzer, 2005). From 2002 to 2007, an annual growth rate of 20% occurred in students taking online classes (McCarthy & Samors, 2009).

ONLINE FACULTY TRAINING

Researchers suggested that both remote online adjuncts and tenured faculty have concerns about training, professional development, and support for online teaching (Keramidas, Ludlow, Collins, & Baird, 2007; Kim & Bonk, 2006). Rice and Dawley (2007) surveyed 178 online faculty and found that 93% had five or fewer years of experience teaching online. The structure of online education differs in methods and approaches, generating a desire by faculty for training and participation in professional development. A new adjunct may be reluctant to ask too many questions in fear of losing the newly acquired position (Kim & Bonk, 2006). Remote online faculty need training to be successful (Shattuck et al., 2011).

Kim and Bonk (2006) suggested that critical components of successful online faculty are training and support. The unique role of an online instructor requires support to meet the various demands of facilitating a class. Kim and Bonk surveyed 562 college adjuncts, including demographic information, questions about online learning, and predictions about online teaching and learning. The researchers found that online faculty had several needs, including abilities to facilitate or manage the online classroom, develop online courses, and continue to develop as a subject matter expert in their fields. Many of the respondents expected to receive training and support from their institutions to prepare for online teaching (Kim & Bonk, 2006). The study indicated that remote online faculty desire training and more research to evaluate if virtual collaboration can fill this void.

Researchers Keramidas et al. (2007) documented the importance of training instructors before teaching in a distance education program for their first time. Hewett and Powers (2007) noted that a significant gap exists in professional development and support of online instructors. Shattuck et al. (2011), added that professional development and training opportunities do not exist for all new online faculty. Even though the numbers of remote online adjuncts continue to grow, the research does not substantively address different options, such as virtual collaboration for training and professional development. Faculty who teach in a brick and mortar building benefit from their peers' nearby availability for asking questions and engaging in discussions, which helps with faculty training (Allen & Seaman, 2010). On-campus faculty have the advantage of office spaces, providing a more natural integration and evolution of learning from their peers (Palloff & Pratt, 2005).

In a study by Ali et al. (2005) 70 faculty members from University of West Georgia shared ways that the university could assist faculty in delivering online courses. The response of the faculty showed a need to provide more frequent and varied training sessions, but the study did not reveal the types of training needed. Their study reviewed the professional development and training needs of remote online adjuncts, thereby, adding to the knowledge of the demands of online teaching.

Remote online faculty need professional development and training which might be achieved through collaboration. A number of researchers found that many of the needs for training, such as using emerging technology, providing quality feedback, and sustaining participation for remote online faculty are not being met (Keramidas et al., 2007; Kim & Bonk, 2006). Collaboration is imperative to higher education faculty training (Harris, 2012). Stevenson et al. (2005) added that collaboration is a practical approach that offers a flexible option for higher-education faculty development. The next section focuses on the concepts and definition of collaboration in higher education. Changes in higher education collaboration deserves attention, especially as these changes relate to the training and professional development of online remote faculty.

COLLABORATION

Collaboration is an integral part of education (Vallance, Towndrow, & Wiz, 2010), and defining collaboration and the role it plays in higher education bears importance. Austin and Baldwin (1991) stated that no definition of collaboration provides a description of the numerous examples. The definition of collaboration varies based on its purpose. Some researchers focus on collaboration as a product while others view collaboration as an intellectual pursuit. Fichter (2005) viewed collaboration as an event by a community of learners that usually leads to a product or culminating project. Vallance et al., (2010) defined collaboration as a group of participants who set out to meet a goal. Blankenstein (2010) described collaboration as faculty frequently working together to improve teaching effectiveness and strategies. Collaboration can take place in many venues and have different outcomes based on the size of the group and the purpose for meeting (Vallance et al., 2010). The definition of collaboration should be broad and flexible (Austin & Baldwin, 1991).

The reasons for faculty collaboration in higher education differ. Austin and Baldwin (1991) stated that collaboration in higher education occurs in two ways: teaching and research. According to Austin and Baldwin, higher education faculty collaborate by conducting research, writing, and partnering in teaching. Collaboration also encourages faculty to think beyond the narrow borders of their classrooms by incorporating diverse teaching strategies, sharing knowledge, and communicating with peers (Stevenson et al., 2005).

Collaboration techniques and strategies in higher education differ based on the setting and needs of the faculty. The types of collaboration can be divided into several categories. The following sections focus on three types of collaboration: face-to-face, virtual, and computer-mediated communication.

In-Person (Face-to-Face) Collaboration

VIRTUAL COLLABORATION

Definitions of virtual collaboration differ throughout the literature. Coughlin and Kadjer (2009) offered one definition of virtual collaboration as process that uses a variety of methods for professionals to work together, pool resources, communicate, and share ideas, fostering opportunities for self-development. For the purposes of this study, a more simple definition offered by Hu et al., (2011) will be used: faculty learn from each other by sharing knowledge and reflecting on common experiences. Similar to K-12 learning communities, college professors also build learning communities to become more effective and improve pedagogy (Hu et al., 2011). Virtual collaboration may take place via e-mail, online faculty forums, virtual learning communities, online mailing lists, and other forms of communication facilitated by technology.

Advancements in technology have allowed faculty and adjuncts to move collaboration practices to online settings (Hu et al., 2011). The development of the Internet unlocked constraints to allow collaboration without limits by physical location (Hemetsberger & Reinhardt, 2009). Other forms of audio and video communication for collaborative purposes include the telephone, writing letters, sending e-mail, and other documents meant for communication (DeRosa et al., 2004).

The purposes for such modes of virtual collaboration vary based on the goals of the collaborators and on the types of universities and their visions (Kabilan et al., 2011). The tools the Internet presently offers provide opportunities for faculty to collaborate virtually in partners, small groups, or larger learning communities. The practice of virtual collaboration frequently occurs through online communities of professional faculty (Kabilan et al., 2011). The Internet offers professionals an opportunity to contribute to groups that support their interests, respond to others intellectual writings, and aid in collaborative problem-solving (Coughlin & Kadjer, 2009).

TYPES OF VIRTUAL COLLABORATION

Forms of virtual collaboration vary. Farooq, Schank, Harris, Fusco, and Schlager (2008) reviewed 5 months of extracted data from January through May 2007 from an educational networking site called Tapped In. In 2009, Tapped In had approximately 20,000 members with 500 active groups (Farooq et al., 2008). The primary dependent variable was online participation. Farooq et al., (2008) also provided the two main categories for participation. The sample evolved from groups based on synchronous versus asynchronous discussions. A definition provided criteria for what comprised an active versus inactive group. The researchers collected participation data of faculty by gathering data from online systems by counting levels of participation. Although the researchers cautioned the generalizability of the study, they found that social networking and online communication provided a means for virtual collaboration (Farooq et al., 2008). Sistik-Chandler stated, "One out of every 6 minutes spent online is spent on a social networking site, and one half of the total United States Internet audience visits a social networking site in any given day" (2012, p. 81). The data from this study did not provide information on specifically how people are using the sites, but the results offer insights into the profuse use of social networking. Tapped In is only one of the many social networking platforms available for virtual collaboration and the generalizability offers transferability to other social networks with some modifications (Farooq et al., 2008).

Other successful forms of online collaboration include e-mail, online discussions, and weekly reflections serving as the collaboration framework, as found by Hu et al. (2011), who noted that these tools allowed five college instructors to reflect on and become better faculty. The researchers sought answers to how online learning communities could support teacher effectiveness (Hu et al., 2011). The participants posted their journals on a weekly basis so that others could reply to them and supported each other with a question and answer thread. The participants used a course management system to share ideas. The study, grounded in a theoretical framework of social constructivism, offered the online learning community a social place where members

virtually collaborated to influence online teaching practices (Hu et al., 2011). According to the researchers, the completed coding emerged with categories for self-reflection on assignments, course design, and seeking help for technical issues. The results indicated that course design was the most referenced theme for self-reflection, followed by general themes based on the literacy learning community itself, seeking and providing advice, and finally reflections on teaching and learning (Hu et al., 2011).

Virtual collaboration proved successful in a variety of modes and venues. Computer mediated communication (CMC) is one form that continues to evolve and expand opportunities for collaboration. The following section addresses the nuance of CMC.

COMPUTER-MEDIATED COMMUNICATION

As early as 1968, researchers for the Department of Defense predicted that a type of computer communities would occur in the future (Fuchs, 2011). Early virtual communities made their debut as early as 1985 with a community of approximately 3,000 learners known as Whole Earth 'Lectronic Link (Sistek-Chandler, 2012). The group formed as an early form of social media where people gathered to communicate online. The earlier uses of CMC included e-mail, chat rooms, and instant messages. Later the definition expanded to include social media because of the change in available tools and platforms (Fuchs, 2011).

The use of CMC provides a diverse group of people the opportunity to come together who could not communicate otherwise (Greene, 2008). In addition, Greene added that CMC allows a broader population to collaborate and permits a social context to exist. CMC differs from face-to-face communication because of its added advantage of threading discussions for archival purposes (Greene, 2008). When opened to the public, CMC permits others to read and provide insights into topics of interest. The advantage of CMC permits communication to be publishable, which allows others access and fosters the social nature of learning (Greene, 2008).

Computer-mediated communication (CMC) offers possibilities for educators to create a process of learning and social connections via the online environment (Kabilan et al., 2011). Alderton, Brunsell, and Bariexca (2011) added that faculty need to engage in dialogue with others who can give support and advice so they can try new and different online strategies. CMC can take many forms from informal dialogue to professional development. For example, online professional development activities and programs have the capability of inspiring virtual collaboration among faculty in a variety of locations in the world (Kabilan et al., 2011). The CMC and Internet applications make collaboration and social connection possible across a variety of programs for different faculty.

One of the most prevalent social networking locations that incorporate the concepts of CMC is Twitter (Alderton et al., 2011). A group of researchers set out to examine how educators use Twitter to collaborate virtually with other faculty. In the study participants originated from a group of educators who used Twitter regularly. Researchers used 200 consecutive individual messages from a random selection for analysis from each of the participants' Twitter accounts (Alderton et al., 2011). The participants also completed a survey consisting of multiple-choice and open-ended questions. Alderton et al., (2011) stated that for the study, respondents indicated if they had ever collaborated virtually on a professional task, implemented something in their professional practice from virtual collaboration, or professionally benefitted from their participation in Twitter. The results reflected that participants used Twitter to collaborate virtually with other educators. Their connections summoned support, asked questions, and shared materials and ideas (Alderton et al., 2011).

In addition, Alderton et al., (2011) stated "Four unique themes emerged from their responses: access to resources, supportive relationships, increased leadership capacity, and development of a professional vision" (p. 360). All 10 of the participants described specific influences regarding their teaching from collaborating on Twitter. The researchers concluded that the majority of the participants' dialogue on Twitter had an educational focus and offered categories of practice, philosophy, questions, and sharing of resources (Alderton et al., 2011). The participants in this study successfully used the social-networking site of Twitter for CMC.

Other research showed that CMC offers a possible approach to professional development and allows online faculty to experience professional growth in innovative ways. The following section will explore examples of CMC used for professional development purposes.

COMPUTER-MEDIATED COMMUNICATION (CMC) AND PROFESSIONAL DEVELOPMENT

Researchers noted that CMC proved to be a vital means for professional interaction among faculty for professional development (Kabilan et al., 2011). Working with a partner or team with CMC and online networks develops a new opportunity that allows faculty to influence their skills (Jarvenpaa & Leidner, 1999). The advances in computer-mediated communication permit members to engage in collaborative work, when distance would permit them from doing so otherwise (Jarvenpaa & Leidner, 1999). According to the research team of Hu et al., (2011):

Results indicated that 90% of the responding universities (63 of 70) used some form of computer-mediated communication, such as e-mail or online discussion groups, to support their interaction within learning communities. E-mail systems were the most commonly used tools (98.4), followed by online discussion forum tools (42.9%), websites (49.2%), course management systems (27%), and virtual chat tools (7.9%). (p. 58)

The research indicated that higher education faculty uses computer-mediated communication as a means to collaborate. In addition, according to Sistik-Chandler (2012) e-mail and search engines are the most popular applications on the Internet, followed closely by social networking sites. Although the opportunities of CMC allow professional development, some disadvantages also exist.

Noted drawbacks to CMC in the literature include CMC as a less exciting and not as emotionally fulfilling experience when compared to face-to-face interactions (DeRosa et al., 2004). Because the CMC offers a different environment than face-to-face collaboration, some faculty may not want to participate (Hawkins, et al., 2012). Others argued that the specific dialogue that takes place in the online environment outweighs the lack of emotional connection (Fichter, 2005; Sistik-Chandler, 2012). For example, communication in an online environment may be more deliberate because a face-to-face environment creates an atmosphere where participants are overly polite to each other in fear of contradicting the other (Fichter, 2005).

Computer-mediated communication provides a pathway, making virtual professional communities a possibility. According to Kezar and Lester (2009) faculty need a means for creating Professional Learning Communities (PLC). CMC provide the means for virtual PLCs. The following section will review virtual professional learning communities.

VIRTUAL PROFESSIONAL LEARNING COMMUNITIES

One form of virtual collaboration occurs through online professional learning communities. The online learning community promotes virtual collaboration and reflection (Digenti, 1998). In an online learning community, faculty communicate through the Internet to achieve a shared goal (Baghdadi, 2011). As professionals collaborate virtually and construct knowledge, they develop communities that support learning and development (Alderton et al., 2011). Reichstetter (2006) emphasized the work of professional learning communities as a team whose members regularly collaborate toward continued improvement in meeting learner needs through a shared vision. The professional learning community takes the form of different groups based on different collaboration needs.

Duncan-Howell (2010) explored the experiences of online groups and offered some decisions concerning possibilities for serving as professional learning communities for faculty. Participants consisted of 98 faculty in different regions of Australia belonging to online communities with diverse teaching experiences. The results reflected that participants sustained their engagement from 1 to 3 years in the online professional learning communities (Duncan-Howell, 2010). The researchers noted that data indicated the faculty who belonged to online communities involved in the study committed 1–3 hours per week in professional learning communities. The outcome of the study represents an additional 60–80 hours per year spent on professional learning (Duncan-Howell, 2010). Study results indicated that membership to online communities provided faculty a meaningful

way to train and support their development (Duncan-Howell, 2010). From this study, professional learning communities might offer a valuable alternative to traditional professional development. In addition, Duncan-Howell (2010) noted that the most significant result collected from the survey was that 86.7% of members considered the experience to be a meaningful form of professional development.

Collaboration and professional learning communities share many of the same traits. DuFour (2004) stated, "To create a professional learning community, focus on learning rather than teaching, work collaboratively, and hold yourself accountable for results" (p. 6) in reference to Professional Learning Communities (PLCs). Blankenstein (2010) used the term "professional practice forums" to describe how faculty can collaborate by sharing concerns, best practices, and strategies for instruction (p. 153). Collaboration provides the online instructor an opportunity to learn from other online instructors and share ideas. The goal of the professional learning community is to help online faculty understand and learn from their peers (Kabilan et al., 2011). The professional learning community focus allows faculty to communicate and develop skills with their peers while developing a sense of camaraderie (Kabilan et al., 2011). Duncan-Howell (2010) stated that professional learning communities provide a connection to other peers. Online professional learning communities offer a chance for faculty to engage with their peers and gain insights to others experiences.

Online PLCs offer other advantages. Roberts et.al (2006) offered that PLCs create an opportunity to take the practice of teaching from private to public. Teaching in private means faculty work in isolation and do not share their practices with others. One study of 20 colleges and universities who had higher than predicated graduation rates found that the most important difference among these schools was an intentional focus on improvement that came from sharing practices through PLCs (Roberts et al., 2006). Online professional communities propagate the sharing of ideas and practices when members share their experiences (Kabilan et al., 2011). Similarly, online forums are a suitable approach for supporting collaboration and professional development through networking with other professionals (Davis & Resta, 2002). Finally, as Duncan-Howell (2010) mentioned, online professional learning communities provide a cooperative medium to collaborate around effective teaching strategies.

Other educational settings reflect similar results about the advantages of PLCs. Although the following quote is about K-12 educational communities, it offers relevancy to higher education PLCs. The National Commission on Teaching and America's Future (2002) encouraged the implementation of professional learning communities:

Quality teaching requires strong professional learning communities. Collegial interchange, not isolation must become the norm for faculty. Communities of learners can no longer be considered utopian; they must become the building blocks that establish a new foundation for America's Schools. (p. 17)

Many studies noted the concepts of collaboration, PLCs, mentorships, and teaming as concepts utilized in educational practices. Although the procedures for collaboration may look different between faculty from different institutions of higher education, many faculty seek to collaborate with peers (Coughlin & Kadjer, 2009). Collaboration takes form in a bevy of different ways, and the evolution of collaboration is noted by Coughlin and Kadjer, who stated "Whether expressed as the peer coaching model in the 70s and 80s, Professional Development Schools in the 80's through the present, or current day professional learning communities, collaboration is increasingly central to emerging models for professional development" (p. 4).

BARRIERS TO VIRTUAL COLLABORATION

The culture of higher education does not always welcome collaboration (Donnison et al., 2009; Kezar & Lester, 2009). The research team of Stevenson et al., (2005) noted possible reasons that higher education faculty do not collaborate, which included: a philosophy of private practice, lack of collaborative tools, and time. Donnison et al., (2009) added that the autonomous practices in higher education promote isolation. Kezar and Lester (2009) added that the division and fragmentation of faculty into separate departments is a fundamental principle of higher education faculty who develop a habit of working independently may not be open to the concept of collaboration. Characteristics of higher education institutions include competition for recognition, which can manifest as individualism (Donnison et. al, 2009). Overcoming a competitive culture serves as a

significant barrier to virtual collaboration among higher education faculty.

READINESS FOR VIRTUAL COLLABORATION

Readiness to collaborate requires knowledge about best practices for virtual collaboration. Even when faculty decide to join a professional learning community, they do not always understand the correlates of effective collaboration. Fullan (2006) noted:

The term [professional learning community (PLC)] travels faster and better than the concept. Thus, we have many examples of superficial PLCs – people calling what they are doing ‘professional learning communities’ without going very deep into learning, and without realizing that they are not going deep. (p. 6)

Faculty should seek meaningful collaboration experiences that is tailored and customizable to their needs (Brooks & Gibson, 2012). Blankenstein (2010) noted several elements to reassuring readiness for collaboration in the K-12 setting, including motivation and commitment. Not all faculty welcome collaboration (Blankenstein, 2010). The term private practice describes faculty who close their doors to teach in isolation (Blankenstein, 2010); faculty who teach in isolation, or “private practice” do not have a readiness level to collaborate virtually.

According to Brooks and Gibson (2012), many online collaboration communities are vacant because to be successful, these forums require participants who are willing to contribute. The skills necessary to manage a collaborative activity are not natural to most individuals (Dittman et al., 2010). The skill set necessary for virtual collaboration includes developing a system to perform work, setting goals, and creating channels of communication (Dittman et al., 2010). Confounding the lack of skills is the active nature of participation in Internet mediums (Schunk, 2008). Faculty need motivation to collaborate to improve their teaching skills, and Fullan (2006) cautioned that external motivation is not enough and that readiness for change comes from the internal desire to improve. Dolan (2011) added that the lack of social cues influences motivation, trust, and ultimately job satisfaction with many remote employees leaving their positions or disengaging from the organization. The lack of motivation may be a barrier for remote online adjuncts if they are not willing to contribute to online collaboration.

Unwillingness to contribute is based on a number of factors. Faculty may find locating a online group to collaborate with overwhelming, due to the sheer volume of Internet communities, forums, and people. For example, LinkedIn, a professional networking site had the following message posted on its website, “As of September 30, 2012, LinkedIn operates the world’s largest professional network on the Internet with over 187 million members in over 200 countries and territories” (“LinkedIn Facts,” 2012, para. 1). A search of the LinkedIn site by the researcher found 13 different communities using the key word ‘adjunct’ in the search menu. The largest group contained 4,288 members and the smallest group contained two participants (LinkedIn, 2012). Finding a virtual collaboration group, partner, or site presents a barrier in spite of, or potentially due to a myriad of options.

Remote online adjuncts may also find difficulty starting virtual collaboration because finding other faculty members who share the same ability levels and reasons for collaboration is difficult (Dolan, 2011). Researchers cautioned that seeking others who have identical teaching personalities and experiences can be detrimental (Brooks & Gibson, 2012). Participants should avoid finding compatible participants to collaborate because the practice does not lead to growth that usually evolves from thought-provoking circumstances (Brooks & Gibson, 2012). Although faculty might seek collaborating with others who have similar characteristics, the comfort of collaborating with like-minded peers may interfere with successful collaboration.

A further barrier to faculty virtual collaboration is that they do not find Internet forums a natural means for communication and therefore rely on the familiarity of modes such as email (Brooks & Gibson, 2012). Researchers found some faculty members took an extended time to transition to the idea of online teaching and required time and assurance to move fully to virtual collaboration (DeRosa et al., 2011). The study by DeRosa et al. (2011), found that Internet users became complacent in the applications they use to communicate. Successful virtual collaboration requires participants’ readiness for using the Internet for communication and a willingness

to try new modes of communication (DeRosa et al., 2011).

COMMUNICATION OBSTACLES

Virtual platforms may pose communication obstacles because of the distance and differences in technology between collaborators (DeRosa et al., 2004). Virtual communication stunts the use of emotions and nonverbal cues (Garrison et al., 2000). Emotion indicates social presence, but in a text-based environment, representing feelings becomes difficult (Garrison et al., 2000). Lack of emotions can impede communication when collaborators are from different cultures and rely on nonverbal cues and gestures to interpret interaction (DeRosa et al., 2004). Without social cues, online communication and collaboration may frustrate participants. Visual cues are a significant mode of communication in face-to-face situations and the lack of visual prompts may act as a barrier in virtual collaboration.

Forming virtual communities takes more than writing words on a screen (Sistek-Chandler, 2012): the messages need to be succinct and convey clarity in the communication. Betts (2009) offered that preparation to collaborate requires an understanding of the differences in face-to-face versus virtual communication. Garrison et al., (2000) described the components of a quality virtual message as one where “. . . the tone of the messages is questioning but engaging, expressive but responsive, skeptical but respectful, and challenging but supportive” (p. 15). In one study, the researcher examined communication and the interpretation tone of e-mails to find that participants overestimated their ability to interpret the meaning of e-mails sent and received (Betts, 2009). Virtual communication and collaboration conducted through virtual communities can be challenging.

Davis and Resta (2002) noted several of these challenges: prioritizing other group members’ needs through responsiveness to e-mail, taking the necessary time to collaborate, and sharing feelings. Tensions can easily form from lack of communication or absence of strong or agreed upon rules (Bauerlein, 2011; Hemetsberger & Reinhardt, 2009). For example, a member not replying to an e-mail within a timeframe that the other participant expects can cause frustration (Sarker & Sahay, 2003). Online communication can give new meaning to the phrase, ‘lost in translation’ (Garrison et al., 2000).

Computer mediated communication does not offer the same feedback as face-to-face interaction. When people collaborate in traditional settings, face-to-face conversations play a significant role in determining the effectiveness and satisfaction of the experience by the physical reaction or evidence of understanding the listener provides (Kabilan, et al., 2011). The absence of face-to-face communication jeopardizes the ability to create common ground among the collaborators, which may lead to communication failure (Kudaravalli & Faraj, 2008). Understanding the lack of cues usually relied upon in face-to-face communication; faculty must plan for a lack of non-verbal signals and find other means for meaningful exchanges (Betts, 2009). Online communication does not provide the same subtleties to sustain group work as face-to-face exchanges (Garrison et al., 2000) and thus participants must be mindful of this lack of visual and social cuing.

TRUST

Without social and visual cues, trust in fellow participants becomes imperative to successful online collaboration. Several researchers found that trust is an integral component of successful virtual collaboration (DeRosa et al., 2004; Jarvenpaa & Leidner, 1999; Moore, 2006). Trust and common purpose characterize successful collaboration experiences among professional learning communities (Moore, 2006). Of all of the influences required to create and maintain a positive experience in virtual collaboration, trust may be one of the most significant (DeRosa et al., 2004; Jarvenpaa & Leidner, 1999). Trust permits participants to establish norms that guide online interactions (Bowditch et al., 2008). Trust also influences how much a participant shares and the attitude toward accepting others’ criticisms (Hu et al., 2011).

Virtual collaborators who never meet face-to-face may experience difficulty trusting each other because virtual meetings do not reinforce social relationships, shared values, and expectations (DeRosa et al., 2004). Brown et al., (2004) noted that “For participants accustomed to face-to-face contact, the uncertainty and ambiguity inherent in virtual relationships is likely to raise doubts that may constrain interactions and

transactions—and trust, by definition, mitigates such constraints” (p. 116). Individuals engaging in face-to-face collaboration use signals such as changes in vocal patterns, body language, and facial expressions to establish trust (Hall, 1999).

An opposing view suggested building relationships is easier and more readily accepted with successful online communication practice (Jarvenpaa & Leidner, 1999). Experienced individuals who learned to trust others through virtual communication may report fewer difficulties with social processes such as trust (DeRosa et al., 2004). Participants lacking virtual collaboration experience may not comprehend the factors needed to build online trust. Jarvenpaa and Leidner stated:

In virtual interaction, trust is likely to be particularly important because collaboration can be effective only if both parties enter into it with a willingness to open themselves to one another and cooperate in carrying out a task, solving a problem, and learning. (p. 117)

Some online communities have bulletin board systems that allow users to share profiles that include pictures, research interests, and contact information. Sharing personal information helps members of the communities get to know each other and discover others who share similar interests or backgrounds (Fichter, 2005).

Researchers recognized trust is a foundation of cooperative behavior such as collaboration (DeRosa et al., 2004; Jarvenpaa & Leidner, 1999; Moore, 2006). Trust is a common barrier to virtual collaboration (Brown et al., 2004; Jarvenpaa & Leidner, 1999). The lack of face-to-face interaction sometimes leads to heightened suspicions and lack of trust by collaborators (Hughes et al., 2002). The absence of trust creates an environment in which participants do not feel safe to share experiences and therefore may lead to difficulties with sustaining ongoing communication.

SUSTAINABILITY

The inconsistent community of participants may present another barrier to effective online collaboration (DeRosa et al., 2004). The instability of participants leaves a collaborative group in an indeterminate state. When membership rapidly fluctuates, quality of virtual collaboration suffers and unreliable or sporadic participation impedes virtual collaboration (DeRosa et al., 2004). When participants have different agendas or reasons for collaboration, communication frequently fails. Hemetsberger and Reinhardt (2009) found that contradictory goals impede virtual collaboration, which may cause participants to lose their desire to contribute and leave the forum. Longer periods of collaboration and meaningful dialogue increase the levels of sustainability. Association with others who do not substantively participate or who only interact for a short period may lead to failed collaboration (DeRosa et al., 2004). However, the ability to cooperate in an online atmosphere does not equate to social connectivity or guarantee the development of a relationship with others that last (Dolan, 2011).

Continued communication and inquiry are two elements needed by the community to construct meaning (Sistek-Chandler, 2012). Although creating an online collaboration system through Google, Yahoo groups, and other sites is easy, participation requires commitment to make collaboration valuable and long-lasting (Brooks & Gibson, 2012) and sustaining dialogue may be problematic for some participants. Another facet of nourishing a virtual community requires prolonged interchange. Because virtual participants' geographical locations vary, they do not always share a common background or experience (Kudaravalli & Faraj, 2008). The group is more likely to sustain attendance when participants experience ownership or loyalty because of the sharing of commonness with others. The group must share the responsibility for prolonged, meaningful, sustained dialogue, underscoring the need for trust among participants.

Time is also a factor in sustaining virtual collaboration. Online remote adjuncts spend a great deal of time managing their online courses (Kim & Bonk, 2006). Many courses have a large student population, which could leave an instructor grading 30 to 40 papers a week (Brabazon, 2002). To add to their already heavy workload, Brabazon suggested that an assumption already exists that faculty are not compensated for much of their work or training. The lack of compensation may lead to a sense of resentment about added obligations and demand that a learning community could place on a remote online adjunct (Brabazon, 2002). The best intentions to collaborate

may not be sustainable because of time constraints. The lack of time committed to the online community results in a lack of social presence (Kim & Bonk, 2006).

SOCIAL PRESENCE

Negative experiences in virtual collaboration may arise from social causes. Various researchers include and define social presence as a key element in online communication (Betts, 2009; Bingham & Conner, 2010; Hawkins et al., 2012; Hughes et al., 2002). Social presence provides a sense that others are present and is necessary for virtual collaboration in which the participants have never met in person (Hughes et al., 2002). Virtual worlds should allow participants to feel as if they are working together and sharing a space (Bingham & Conner, 2010). Betts conveyed the importance of online faculty feeling connected to a group that maintains communication through online communities. In addition, the research team of Hawkins et al., (2012) found social presence to be an ability to portray oneself as a genuine person in an online community. According to Garrison et al., (2000) participants in computer conferences who never met the other participants find the lack of visual cues challenging to establishing the sense of having a conversation with a genuine person (Garrison et al., 2000). Social presence gives the collaborators a sense of emotional connection to others when online (Scarpetta, 2008).

Taking turns or remembering to respond to others provides a sense of social presence (McConnell et al., 2012). Transmitting documents, responding to requests, and acknowledging receipt of documents or messages facilitates turn taking (Sarker & Sahay, 2003). In a 12-week study of online collaboration of novice faculty, Davis and Resta (2002) noted that virtual collaborators found it challenging to remember to respond to e-mails. Participants expect that the receivers will respond in a turn-taking fashion. Disruptions to turn taking happen with easily distractible participants. McConnell and research partners described some of the distractions that can interrupt virtual meetings and communication as pets, family members, and telephones. These interruptions can lead to a lack of social presence or the sense that the other participant is not attending.

Strategies to incorporate a feeling of social presence into virtual collaboration are complex. Social presence must compel the participants to navigate through the community (Sistek-Chandler, 2012). Social presence requires more interaction between participants than simply reading discussion posts or e-mails (McConnell et al., 2012). A differentiation exists between a collaborative community where inquiry occurs and a place where people go to find information (Garrison, 2006). Social presence requires purposeful interactions among participants. For example, when users create fake identities for communicating with others, social presence is not reinforced (Schunk, 2008). Hawkins et al., (2012) specified, "Indicators of social presence include humor, self-disclosure, and the use of informal language to show affection" (p. 126). Hemetsberger and Reinhardt (2009) noted that technology usually follows agreed upon social rules and norms to create social presence. These rules and norms include cooperating with others, sharing of information, and acceptance of new collaborators (Hemetsberger & Reinhardt, 2009). Social presence comes from representing oneself in a realistic form, while following group norms. The interaction required to develop social presence may be difficult for first time users of social networking sites or virtual collaboration forums.

Further, Garrison et al. (2000) viewed social presence as necessary for personal fulfillment so that the participants continue to contribute to the collaborative experience. In addition, social presence develops through "familiarity, skills, motivation, organizational commitment, activities and length of time using the media" (Garrison et al., 2000, p. 13). Duncan-Howell (2010) found that online communities are not inhibited by time, which provides members to fluctuate in terms of participation, unlike face-to-face collaboration in which specific timelines are in place. Researchers Garrison et al. stated "Social presence in the form of socio-emotional communication is possible in computer mediated communication, but not automatic" (2000, p. 13); thus, these goals are achievable with significant commitment from participants. Bauerlein (2011) stated that socialness is achievable through the Internet, but more research should be conducted to find if these connections could be satisfying enough to warrant continued collaboration.

TOOLS

The popularity of the Internet led to great advancements in terms of collaborative tools. The

advancements and variety of collaboration tools on the Internet offer both advantages and disadvantages. According to Xu et al., (2008) the first examples of virtual collaboration tools included e-mail, chat, whiteboards, and file sharing. Specifically, e-mail is still a major communication tool for virtual collaboration (Fichter, 2005; Sistik-Chandler, 2012). Hu et al., (2011) saw the variety of social media tools as a benefit for online collaborators. However, Fichter noted that the large selection of Internet tools is a disadvantage of successful virtual teamwork, as too many tools might overwhelm collaborators. Fichter (2005) added that virtual collaboration failure could result from unusable software that requires complex routines.

A useful Internet tool for virtual collaboration must meet the needs of the participants (Schunk, 2008). Specifically, the tool should be easy to use and accommodate a wide variety of users. Many people do not have time or desire to learn different tools (Fichter, 2005; Hu et al., 2011). Schlager et al., (2009) mentioned that professional networks between educators are a growing movement, but Jarvenpaa and Lediner (1999) cautioned that user acceptance of the technology is only one ingredient to successful collaboration. Advocates of virtual collaboration may argue that an online remote adjunct teaches in a virtual world and therefore should have the basic skills required to navigate the Internet, but some remote online adjuncts might not feel comfortable outside their own online classrooms and might not use outside resources provided by the Internet (Shattuck et al., 2011). Schunk (2008) found that technology only has value when it aids in finding solutions to the dilemmas that people are trying to solve; indeed, the prolific development of online products responds to the problems people encounter online, but the sheer quantity of these products may present further issues to users.

Bauerlein (2011) found that “users are remarkably good at repeated tasks on their favorite sites [but], they’re stumped by the smallest usability problems when they visit new sites for the first time” (p. 55). Too many collaboration tool choices leads to users feeling overwhelmed by the available options (Xu et al., 2008). Virtual collaborators feel comfortable navigating known Internet sites because of the familiarity with the tools (Xu et al., 2008). Bauerlein added that “first-time visitors to a site don’t have the conceptual model needed to correctly interpret menu options and navigate to the appropriate place” (p. 56). This confusion leads to prematurely exiting the site before accomplishing meaningful work. Online collaborators require a platform that offers a user-friendly infrastructure. Farooq et al., (2008) studied the need for design interventions to foster online community and collaboration for educational professionals. To facilitate virtual collaboration, tools need to allow for efficient and easy collaboration (Xu et al., 2008).

Restrictions of some Internet collaboration tools hinder communication: Twitter is one example of a restrictive tool that participants use for virtual collaboration. Although Twitter is advantageous as a tool for virtual collaboration, Twitter limits the user to typing a small amount of characters into the response (Alderton et al., 2011) and for new virtual collaborators, the limited characters cause dissatisfaction. In a dissenting study by Alderton et al., (2011) researchers found Twitter to be an effective collaborative tool for educators. One part of the study looked at dialogue between the participants to show evidence of collaboration versus unidirectional sharing of information (Alderton et al., 2011). The researchers coded the dialogue to differentiate between collaboration and conversation. They noted that the survey results indicated that 9 of the 10 participants gave concrete examples of collaboration that occurred with fellow Twitter users. The researchers found that because of the limits of a 140-character message, the participants used Twitter as a place to make initial connections but moved their collaboration to other venues (Alderton et al., 2011). Researchers offered one way to measure the usefulness of a virtual collaborative tool by comparing the tool to traditional face-to-face communication as well as the amount of effort necessary to use the communication medium (DeRosa et al., 2004).

Another problem unique to virtual collaboration are the perceptions that software is difficult to use or users experience problems with connectivity and access (Hughes et al., 2002). Tools that take too much time to learn can be drawbacks for virtual collaboration (Fuchs, 2011). Finally, contradictory technical skill levels among participants may also inhibit efforts causing nervousness, misperception, and ineffective collaboration (Ge, Yamashiro, & Lee, 2000). Understanding how to use the technology and experiencing technical difficulties hinders communication, interaction, and virtual collaboration among participants, generating frustration (Ragoonaden & Bordeleau, 2000). Even with 3 years and more experience, participants in one study still struggled to use Internet tools (Bauerlein, 2011). Collaborators may find that virtual collaboration is too difficult because of the software and Internet tools.

Summary of Barriers

Several barriers exist for successful virtual collaboration. First, individual readiness levels might influence virtual collaboration. Second, communication obstacles provide a barrier to understanding other intentions because the lack of visual cues. Next, participants have difficulty developing trust in online forums. Another barrier to virtual collaboration is sustainability. An inconsistent community of participants is a barrier to creating a cohesive group (DeRosa et al., 2004). A lack of social presence may also deter participants from virtual collaboration (Garrison et al., 2000). The true attention belongs on what the tools support in terms of collaboration. The tools themselves can serve as a barrier to virtual collaboration (Sistek-Chandler, 2012). Understanding the barriers provides remote online adjuncts and higher education administration with an understanding of what issues inhibit successful virtual collaboration.

BENEFITS

The benefits of virtual collaboration are similar to face-to-face collaboration benefits. The following section will focus on three benefits of virtual collaboration: overcoming isolation, providing a social context, and creating professional development opportunities. An online remote adjunct works in isolation from a home computer. One possible benefit of virtual collaboration is a decrease in the sense of being isolated from peers (Scribner-MacLean & Miller, 2011). Another benefit of virtual collaboration is the social connectivity that online communities provide. Social contexts provide an important outlet for learning (Greene, 2008). Researchers found that virtual collaboration is an effective means to professional development among higher education faculty (Dolan, 2011; Puzifferro-Schnitzer, 2005).

OVERCOME ISOLATION

In a brick and mortar building, faculty can meet in a lounge or by the water cooler to socialize (Bauerlein, 2011). Remote online adjuncts do not have a physical faculty room to socialize with their peers, although some online universities do offer online faculty forums. The sense of isolation may affect an online remote adjunct's performance (Scribner-MacLean & Miller, 2011). Dolan (2011) stated that limited opportunities for communication with peers appear to be harmful to morale, leading to lower performance. According to Shea (2007) less experienced instructors are not motivated to teach online because of the newness of online training, inability to watch others teach online before attempting online teaching, and inadequate time to learn about online teaching. Brooks and Gibson (2012) found that faculty show interest in virtual collaboration because of curriculum needs or the desire to communicate and receive advice from peers.

Isolation experiences come from feeling like an outcast by the academic mainstream (Dolan, 2011). Shea stated “. . . a perennial concern is that online learning may be marginalized from the core cultural practitioners, i.e. traditional faculty, and reside at the periphery of college life with the stigmatizing impact that such marginalization implies” (2007, p. 12). Virtual collaboration may offer a solution to isolation and a sense of being unsupported. People are social; Bingham and Conner (2010) stated that people always have wanted to connect, communicate, and share with one another. Instructing online without face-to-face interaction may influence an adjunct's view of teaching. To this, Dolan (2011) added that without opportunities for socialization, low morale could lead to less effort and lower quality of instruction.

Paloff and Pratt (2001) provided further impetus to examine online teaching because faculty isolation may result in an online program that appears fragmented. Remote online educators without a strong sense of connectedness to their employing institution often have less dedication and contribute to faculty attrition (McLean, 2006). Nationally, adjuncts teach one-third to half of the courses and represent approximately two-thirds of all community college faculty (Puzifferro-Schnitzer, 2005), and thus their sense of connection to their colleagues and the institution is critical to effective instruction. Bingham and Conner (2010) found that people desire a chance to collaborate and feel connected to others. Duncan-Howell (2010) added that the Internet provides opportunities for virtual collaboration so that remote online adjuncts might connect with their peers.

One form of virtual collaboration with positive results comes in the form of online mentorships. Some

universities offer their new online adjuncts virtual mentorships as a means for initial training and professional development (Bauerlein, 2011). According to Roberts et al., (2006) peer mentors provided an effective way to help new faculty transition to and online teaching. Mentors play an essential role in helping new faculty overcome the sense of isolation. The mentor can also act as a point of contact, which helps remote online adjuncts become more effective and successful instructors (Puzziferro-Schnitzer, 2005). One role of the virtual mentor is to communicate with the new faculty and offer suggestions about instruction, pedagogy, and using the technological tools specific to the institution (Puzziferro-Schnitzer, 2005). The researchers also added that mentoring is a meaningful way to support, coach, and improve instructional strategies and teacher effectiveness.

In a self-study, Roberts et al., (2006) documented the transition from face-to-face teaching to online teaching in the educational leadership department at Western Carolina University (WCU). One result of the study showed that faculty at WCU could connect socially to each other (Roberts et al., 2006). Although faculty reported working in isolation before the transition to online teaching, afterwards the instructors reported a feeling of friendship among their colleagues because of virtual collaboration (Roberts, et al., 2006). The online faculty learning communities at WCU provided a safe venue to vent frustrations and ask for assistance (Roberts et al., 2006). Kabilan et al., (2011) found similar results with K-12 faculty who moved to online teaching. Participants who had worked in isolation found virtual collaboration to remove traditional notions of working alone and reported benefits from the experience (Kabilan et al., 2011). Virtual collaboration benefitted participants in the evolution from face-to-face to online teaching (Kabilan et al., 2011; Roberts et al., 2006).

Simple forms of virtual collaboration such as e-mail remove the traditional barriers of time and space (Davis & Resta, 2002). E-mail helps to develop and lengthen virtual conversation and offers an ability to extend the boundaries of geography (Davis & Resta, 2002). Even with other advancements, e-mail is an important way to collaborate (Xu et al., 2008). One benefit of virtual collaboration via E-mail is the ability for archiving. Storing computer-mediated communication gives the collaborators time to reflect and provides control of interaction time (Seddon, Skinner, & Postlethwaite, 2008).

Other forms of virtual collaboration present participants the ability to enter into continual discussion. Instant messaging provides users the chance to collaborate and offers immediate gratification by providing real-time immediate response (Fichter, 2005). The interactive capabilities of instant messages or chat features allow virtual collaborators to feel a sense of connection to others. The benefits of virtual collaboration include a variety of ways that users can connect to others in discussion.

Research team Hawkins, Barbour, and Graham (2012) recommended the virtual schools seek methods to incorporate social media to reduce the feelings of isolation that come from remote online teaching. They also noted in their K-12 virtual high school case study that online faculty felt disconnected from other online faculty. The participants expressed feelings of disconnection and isolation. The researchers suggested that the faculty create a virtual staff room so that faculty could collaborate, socialize, and share practices (Hawkins, et al., 2012). Socialization opportunities are one means for decreasing the isolation that a remote online adjunct may experience. Understanding the social learning theory provides insights into how remote online faculty might overcome isolation.

Dolan (2011) researched 28 adjunct faculty members' views on motivation in a qualitative grounded theory study. One of the common findings was that adjuncts felt disconnected from peers and the college. Dolan (2011) established that an absence of communication and engagement in collaboration led to a lack of identification with the college. He also found from participant interviews that adjuncts desired a means to learn from peers and thought the communication would make them better faculty. The impact on faculty engagement for this unique set of employees still requires attention.

SOCIAL CONTEXT: VYGOTSKY AND BANDURA

In addition to overcoming social isolation, it is important to consider the Social Learning Theory which emphasized education that takes place in a social setting. Two psychologists led the way in the social learning

theory: Vygotsky and Bandura. First, Vygotsky's sociocultural theory viewed the construction of learning through social interactions (Alderton, et al., 2011). One of Vygotsky's main premises was that learning does not occur in isolation (Schunk, 2008). Observational learning, imitation, and modeling are three key components of the social learning theory (Ormrod, 2003). Bandura (1977) stated, "Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what to do" (p. 22).

Researchers consider Vygotsky's theory of social learning a constructivist approach (Schunk, 2008). Researchers further stated that a constructivist approach is one in which social experiences create knowledge (Schunk, 2008). The PLC originates from a social constructivist view of knowledge that considers the exchanges and relationships to be an integral part of understanding new concepts (McConnell, et al., 2012). Social learning theorists Bandura (1991) and Vygotsky (1978) found that learning is highly social and naturally collaborative. Alderton and associates (2011) suggested that faculty needed to collaborate with others for guidance to reflect upon and change their practice and participation in a virtual collaborative mentorship may fill a social need for remote virtual adjuncts. Seddon et al., (2008) added that participants could experience motivation from engaging in virtual collaboration.

Virtual collaboration may begin for one reason but continue because of a different motivation or unintended outcome. Some of the reasons to continue collaborating may include wanting to make more meaningful changes, desiring a social connection to a group, or a need to develop more as a professional (Seddon et al., 2008). Vygotsky (1978) emphasized the interpersonal nature of social learning and according to Schunk (2008) he revealed that a social atmosphere was necessary for learning. Fullan (2006) stated, "Professional learning communities are in fact about establishing new collaborative cultures. Collaborative cultures, ones that focus on building the capacity for continuous improvement, are meant to be a new way of working and learning" (p. 6). Seddon et al. (2008) also found that the developing a virtual community could increase the diversity of a group and reduce competition while creating a culture of collaboration.

Studies in computer-mediated communication (CMC) rely on the idea that both human beings and technology require understanding within a social context (Hemetsberger & Reinhardt, 2009). Researchers ground virtual collaboration in a theoretical framework of social constructivism (Davis & Resta, 2002). In addition, Bonk (2002) defined key sociocultural terms such as scaffolding when researching virtual collaboration. Garrison (2006) noted that higher education communities require active social presence to establish significant and meaningful learning. Social exchanges and sharing of knowledge becomes open to the community, which improves learning (Greene, 2008). The Massachusetts Institute of Technology (MIT) recognized the importance of human connections, socialization, and collaboration by opening sections of its course content to the world (Schunk, 2008). In contrast, because virtual communication lacks social cues present in face-to-face collaboration, participants may find it easier to concentrate on the group project instead of on the commonalities and communicative intricacies of body language (DeRosa et al., 2004).

Although some studies suggested that the lack of face-to-face and non-verbal cues might impede virtual collaboration, others noted that missing cues might not be a detriment. Bauerlein found the Internet's ability to foster socialization surpasses naysayers' original opinions by "augmenting our people skills . . . widening our social networks, and creating new possibilities for strangers to share ideas and experiences" (2011, p. 33). The Internet is instrumental in fostering a social context for learning. Virtual collaboration fosters collective intelligences while establishing a means to avoid isolation through social situations (Bauerlein, 2011).

PROFESSIONAL DEVELOPMENT

"The Internet enables some of the best teaching minds to bond together in powerful learning communities" (Berry, Norton, & Byrd, 2007, p. 48) and online communities are common practice in education, offering many ways for adjuncts to share resources and apply new learning to their own practice (Puzziferro-Schnitzer, 2005). Professional development activities are one means to provide opportunities for instructors to increase their effectiveness by developing new knowledge and practicing new strategies (Anderson & Kanuka, 1997). Quality instructors yearn to learn new skills and pedagogy through professional development (Puzziferro-Schnitzer, 2005). In terms of developing as a professional, one suggestion that the research team of Hu et al., (2011) offered is that faculty may further their knowledge base through collaboration or by seeking advice from

a professional learning community. One way to limit teacher isolation and focus on professional development is with virtual learning communities.

The Association of American Colleges and Universities realized the significant role that collaboration plays in its vision of education (Schunk, 2008). In addition, Brooks and Gibson (2012) noted the following about effective online professional development:

It allows professional development to be more relevant, meaningful and engaging to faculty because they are able to 1) have choices in their learning experiences (e.g. opting in and out), 2) take advantage of the flexibility of the technology (e.g. learn when and where it suits their schedules), 3) customize the experience (e.g. connecting with specific colleagues and researchers) and 4) have space to be reflexive. (p. 3)

Remote online adjuncts who teach in uncommon fields may find a solution for acquiring meaningful professional development through virtual collaboration. Virtual collaboration may offer a variety of professional development choices for faculty.

Virtual collaboration provides the pooling of resources from a range of fields (DeRosa et al., 2004). Bauerlein (2011) stated that virtual spaces for collaboration offer a means to gather and share collective knowledge and experience. Lifting the boundaries of time and distance provide more flexibility and applicability to different fields. Fullan (2006) also stated that professional development has to be meaningful to motivate people to put in the effort and reap the benefits of the activities. Virtual collaboration may also provide greater flexibility and freedom in terms of training because online adjuncts do not experience confinement to a traditional workday or place (DeRosa et al., 2004). Budget constraints may also limit the availability of guest speakers, renting conference rooms, and travel expenses. However, well-designed virtual collaboration as a means for professional development can be affordable and not limited by the restrictions imposed on face-to-face faculty (Brooks & Gibson, 2012).

Fichter (2005) noted several reasons for virtual collaboration as a means to professional development, "Some collaboration initiatives are targeted specifically at communities of practice, helping them find specific information on a topic, share successes, develop best practices, replicate ideas, and identify experts" (p. 48). Virtual collaboration permits faculty a chance to view their online classrooms and practices from a new perspective. The self-reflective practices heighten their understanding of their own professional strengths and weaknesses, which fosters investigating pedagogy and teaching philosophy (Kabilan et al., 2011). Brabazon (2002) found that too much emphasis is placed on design issues in online education instead of on faculty training. Bingham and Conner (2010) suggested that faculty should begin virtual collaboration by learning through trial and error. Professional development provides a means for remote online faculty to test ways of virtual collaboration and learn best practices in a safe environment.

A significant body of research shows that professional development needs to be meaningful and flexible to meet the time restrictions of the participants (Brooks & Gibson, 2012). The adjuncts have time constraints for training because many remote faculty work for multiple universities or in a separate full-time position. Davis and Rose (2007) offered a change in the way professional development occurs, shifting from all day marathon sessions to shorter dashes using virtual methods. Schunk (2008) further noted that a university should provide for the development of an online faculty community for faculty to share effective pedagogy. The research supports the need for high quality professional development for online faculty. Brabazon (2002) demanded more attention be paid to online faculty training "The laissez-faire attitude to teacher training has relied on 'gifted amateurs' rather than structural change to initiate Internet-based education" (p. 13). Although the role of virtual collaboration in professional development of remote online adjuncts remains undetermined, many of the elements in face-to-face professional development share the same needs as virtual collaboration.

THE STUDY

A major obstacle to understanding virtual collaboration is the lack of appropriate frameworks, tools, and techniques to study it (Schlager et al., 2009). The literature review did not reveal a specific tool or technique for studying virtual collaboration. A validated survey instrument was unavailable even after contacting several of the key authors in the field. To understand how remote online faculty collaborate virtually, this study needed to address their lived experiences. The nature of this study required a qualitative method to understand the specific ways that remote online faculty collaborate virtually.

The purpose of a qualitative approach was to investigate the unknown variables needing exploration (Creswell, 2009). Because the study sought to find the current virtual collaboration practices of remote online faculty, the study needed to review the lived experiences of remote online adjuncts' virtual collaboration practices. Specifically, the design employed a phenomenological approach to understanding virtual collaboration practices of remote adjunct faculty. The main purpose of this study was to conduct exploratory qualitative research to determine the virtual collaboration experiences of remote online adjuncts and create a model of lived experiences in the form of a transcendental phenomenological approach to describe the virtual collaboration experiences of remote online adjuncts. Creswell (2007) stated, "Moustakas's transcendental or psychological phenomenology is focused less on the interpretations of the researcher and more on a description of the experiences of the participants" (p. 59).

For this qualitative study, selection of the participants occurred by collecting a specific group of participants. First, participants met a defined set of operational criteria through preliminary screening, whereby candidates qualified to serve as participants (Yin, 2008). The screening took place via an e-mail to a list serve asking for volunteers to participate in the study, specifically those faculty who had experience with virtual collaboration and were remote online adjuncts. The inclusion criteria was as follows:

1. Participants must only work online from their home computers and not attend a physical campus. Participants must be telecommuters who are isolated from their peers and do not attend a brick and mortar building.
2. Participants must not have any opportunities to collaborate face-to-face with their colleagues.
3. Participants must only work as adjuncts who are part-time employees.
4. The participant can work for more than one college, but all work must be done from the home computer. If the adjunct steps onto a physical campus, he /she is not eligible to participate in the study.
5. Participants need to have a minimum of three years' experience as a remote online adjunct.
6. Participants must also have experience with virtual collaboration.

The purposeful sample intentionally samples a group of people who can best inform the researcher about the situation (Creswell, 2007). Several sources of data provide a broader overview of remote online adjuncts collaboration practices. Yin (2008) noted that the use of multiple sources of evidence permits a researcher to address the phenomenon in its totality. A background and demographic questionnaire provided information about the final selected participants; the purpose of this data was to formulate a description of the participants and prepared the data for analysis.

The final step of data collection resulted in phone interviews of the participants. The phone interviews took place separately, within two weeks of each other. The short time span allowed the researcher to adhere to the same phone interview protocol for all participants. Written permission from each participant allowed for recording of phone interviews. Recordings permit a more accurate rendering of the interview than any other method (Yin, 2008).

The semi-structured interview permitted follow-up questions and changing the order of the questions based on responses. Yin (2008) recommended that a study contain specific questions and intentions so that it stays within realistic parameters. With this in mind, the interviews guide the conversations instead of structuring the interviews with surveys (Yin, 2008). Semi-structured interviews allow the use of predetermined questions, while leaving space for probing beyond given answers (Esterberg, 2002).

CENTRAL QUESTION

What effective virtual collaboration practices are remote online adjuncts using to influence their teaching strategies and to develop as professionals?

SUB-QUESTIONS

1. What methods or approaches are remote online adjuncts using for virtual collaboration?
2. What are the reasons for virtual collaboration among remote online adjuncts?
3. What are the barriers keeping remote online adjuncts from virtually collaborating?
4. What are the benefits for remote online adjuncts who virtually collaborate?
5. What are the perceptions of remote online adjuncts about virtual collaboration?
6. What underlying themes, if any, emerge from remote online adjuncts experiences of virtual collaboration?

FINDINGS

The review of the literature provided the context to support the central question: What virtual collaboration practices are remote online adjuncts using to develop as professionals? From this question, the review of the literature categorized the benefits and barriers to virtual collaboration. The two categories helped establish the specific areas for exploration of the study. The interview questions and demographic forms were used to gather data to answer the central question. Nine themes evolved as follows:

Barriers

- Need for leadership
 - Set clear roles
 - Create opportunities for collaboration
 - Connect collaborators
- Trust
- Lack of time
- Pressure to collaborate

Benefits

- Camaraderie (fellowship)
- Social Connections
- Scholarship- research
- Self-Reflection
 - How do I measure-up?
 - What is my performance compared to others?
- Pride

MEANING THEME 1- NEED FOR LEADERSHIP

The need for leadership in virtual collaboration among remote online adjuncts was apparent. First, a lack of norms, undefined roles, and the absence of social cues leaves participants unsure of what their responsibility is in virtual collaboration. There is a need for clear roles and a structure of consistency in virtual collaboration experiences. In many instances, the participants noted that collaboration happens haphazardly without leadership. Chen et al (2011) found that assorted participation without organization can cause “chaotic and ineffective learning” (p. 216). Two participants specifically noted that virtual collaboration required a shift in roles. Often they found themselves adjusting to be the learner or listener. Second, participants seemed to need a direction for their collaboration. For example, participants mentioned reasons for working on curriculum, creating rubrics, or sharing best practices, but felt that a faculty forum dedicated to collaboration would make the process easier. Last, participants expressed difficulty connecting with other collaborators. The participants were unaware of how to obtain contact information of other people working in their departments. Participants shared a desire to collaborate with others teaching the same courses, but did not know how to reach out to their peers. Some participants saw a disparity in how to begin collaborating because they did not know how to find

collaborators or where to collaborate.

MEANING THEME 2- CAMARADERIE (Fellowship)

Many participants found themselves positively transformed by their connection to their peers and colleges because of virtual collaboration. A number of remote online adjuncts responded that virtual collaboration unites them with others who share similar experiences. Virtual collaboration exposes remote online adjuncts to others who share a common language, have mutual problems, and understand the diverse issues of teaching online. Speaking the same language and sharing the same experiences was a source of comfort. Communication with others who share similar experiences is important to remote online adjuncts. Faculty members find it reassuring to hear what their peers are experiencing and interacting with peers helped the participants have a more positive experience while teaching remotely.

MEANING THEME 3- TRUST

Trust appeared to be offered freely by the participants in this study. Several remote online faculty emphasized an unspoken level of trust with online collaborators that is not existent in face-to-face situations. Several noted the need to focus on clear messages that were well-crafted and maintained positive tone to ensure the manifestation of trust. Importantly, several mentioned granting more trust to online collaborators because they felt their relationships were greater. Trust was highly valued by the participants.

MEANING THEME 4-SOCIAL CONNECTIONS

One of the most frequently voiced benefits of virtual collaboration was a social connection. Remote online adjuncts often feel alone and isolated. Many talked about the satisfaction that they have from socializing with peers. Several participants noted that virtual collaboration was their only connection to the university. One participant called it her “lifeline.” Another participant referred to the strong connections made in virtual collaboration as “virtual friends.” Social connections provided a link to their peers and different colleges represented by the participants.

MEANING THEME 5- SCHOLARSHIP (Research)

Participation in scholarship is an iterative process required by some of the participants’ colleges. The pressure to publish seemed to be a catalyst for virtual collaboration. Ann shared the feeling of being pressured to publish in order to keep working in higher education. In addition, a need for acknowledgement by their employees thrusts remote online adjuncts into virtual collaboration. Remote online adjuncts see virtual collaboration as a means to publish articles, present at conferences, and participate in research through collaborative efforts.

MEANING THEME 6- SELF-REFLECTION- (HOW DO I MEASURE-UP? WHAT IS MY PERFORMANCE COMPARED TO OTHERS?)

Virtual collaboration provides impetus for self-reflection. Comparing oneself to others becomes an opportunity for remote online adjuncts to evaluate use of their own best practices. For several instructors, they recalled feeling anxious about teaching online. The lack of interaction with peers left them feeling unsure of their performance. Paralleling with their peers’ practices helps some participants solidify what constitutes good practices in online teaching. In a sense, discovering what other faculty members do in their online courses did more than just help the participants affirm their own practices, it also expanded their definitions of quality teaching. All of the participants’ shared that in some manner their virtual collaboration experiences helped enlighten their remote teaching practices. Moreover, the context for needing to know what others are doing seemed to correspond to their own self-actualization. Remote online adjuncts were more confident with the knowledge that peers use the same, or similar, protocols, practices, and procedures.

MEANING THEME 7- PRIDE

The remote online adjuncts expressed pleasure when contributing to the learning community. Actively

participating in a group enabled some to feel that they had given back or reciprocated to their peers. Supporting peers through mentorship and modeling created a sense of fulfillment to the remote online adjuncts. For many, the opportunity to engage in professional dialogue with their peers helps them to feel a sense of accomplishment. The participants viewed helping their peers as way to build pride.

MEANING THEME 8- LACK OF TIME

The lack of time appeared to create frustration for remote online adjuncts. Two of the participants noted that a misperception exists about virtual collaboration taking less time than face-to-face collaboration. Some remote online adjuncts had an opposing view of time and found that virtual collaboration saved them time because they did not have to drive to a specific destination. Some faculty noted that time adversely affected their ability to collaborate virtually because of living in different time zones. All of the participants acknowledged that without given adequate time, virtual collaboration would not succeed.

MEANING THEME 9- PRESSURE TO COLLABORATE

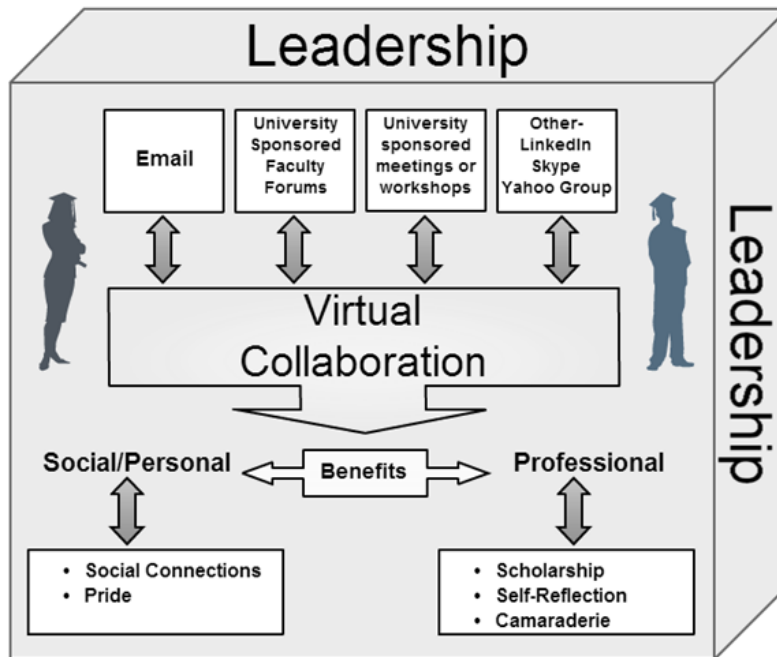
Central to the theme of virtual collaboration was a sense of pressure to improve or to publish. The particular contexts and colleges in which the participants taught influenced their views on the pressure associated with collaboration. The participants that worked for colleges that require publication felt pressured to collaborate. Others felt that they needed to be “seen” in collaboration with their peers by administrators. For some, the pressure to publish or conduct research changed the way they virtually collaborated by seeking out others who also shared the same goal. Two participants specifically mentioned that the colleges are expecting remote online adjuncts to engage in virtual collaboration. One participant mentioned that virtual collaboration is a prerequisite to serving as a faculty member. Several participants felt a sense of obligation to contribute to virtual collaboration.

SUMMARY OF RESULTS

All of the nine meaning themes could be construed as barriers or benefits of virtual collaboration. Nine units of meaning evolved from the collection of data: (1) Need for leadership (which was broken into 3 key parts: (a) clear roles (b) create opportunities for collaboration (c) connect collaborators); (2) Camaraderie (fellowship); (3) Trust; (4) Social Connections; (5) Scholarship (research); (6) Self-Reflection (How do I measure-up. What is my performance compared to others); (7) Pride; (8) Lack of time; (9) Pressure to collaborate. Self-reflection was an unexpected theme to emerge. Virtual collaboration provides a means to combine social learning with the remote online adjuncts need for self-reflection. The research on social learning discussed the need for learning appropriate behavior through imitation of others (Bingham & Conner, 2010). The participants in the study measured their own effectiveness by comparing themselves to what their colleagues are doing in the classroom. Because most adjuncts cannot visit their peers’ online classrooms, virtual collaboration offers a means by which adjuncts can evaluate their performance against peers.

VIRTUAL COLLABORATION MODEL

One goal of the study was to create a virtual collaboration model of the lived experiences of remote online adjuncts. Figure 1 illustrates the methods or entryways of virtual collaboration. The model centers around the need for leadership. The model displays the social, personal and professional benefits of virtual collaboration. The model is also a pictorial representation of the 6 sub questions of this study. The model is intended to increase the knowledge of virtual collaboration practices for both remote online adjuncts and administrators of higher education.

Figure 1. Schieffer Virtual Collaboration Model for Remote Online Adjuncts**Implications for Educational Leaders of Higher Education**

Remote online adjuncts are willing to virtually collaborate. Higher education leaders who are interested in providing virtual collaboration can create opportunities, define roles, and connect collaborators. The study also revealed ways that higher education leaders can continue to facilitate ongoing collaboration through workshops, faculty forums, and scholarship opportunities.

Remote online adjuncts want guidelines and methods for collaboration. Although it was unclear to what extent the adjuncts desire a rigid program, it was apparent that those colleges offering faculty forums should continue to look for ways to improve their use. A common misconception is that individuals within a group have the natural ability and skills to assemble and develop methods towards goal completion (Dittman et al., 2010). Shattuck et al. (2011), established that not all adjunct faculty are prepared for online training. Educational leaders should aspire to create a space that brings together the diverse talents of people and connects them in meaningful ways (Bingham & Conner, 2010).

Adjuncts want to connect to others and are unsure how to do so. For higher education leaders, consideration needs to be given to connecting aspiring collaborators with their peers. Shattuck et al. (2010), found that institutions that provide online training and collaboration for adjuncts do not always do so in a convenient manner. Workshops and content meetings seemed to be a useful method for remote online adjuncts to find others who teach the same courses. Although this study encompassed a large variety of fields such as business, education, nursing, economics, and liberal arts, all fields benefit from the implications of the study. Dittman et al. (2010) discovered that virtual teams require proven training, which will prepare them for a variety of collaboration conditions.

A sense of pressure to collaborate is felt by remote online adjuncts. Ideally, higher education leaders should search for ways to encourage virtual collaboration without creating a negative climate. Creating a system that empowers remote online adjuncts to enjoy the benefits of virtual collaboration without feeling pressured by the administration. In addition, Bingham and Conner (2010) found that a common way to increase employee satisfaction is to help employees understand “what is going on in the company” through communication (p. 5). An advisory or focus group may help educational leaders develop an approach to serve remote adjuncts in a positive environment.

CONCLUSIONS

Remote online adjuncts benefit from virtual collaboration. The study revealed the benefits and barriers to virtual collaboration. The benefits included: social connections to the colleges and peers, a means for self-reflect on practices, and developing camaraderie and a sense of pride while helping others. The barriers for virtual collaboration included a lack of leadership that is needed from institutions of higher education to provide collaborators with clear roles, opportunities for collaboration, and the means for finding other collaborators. Time is also a barrier that should be addressed by both adjuncts and administration.

A certain level of ambivalence exists around virtual collaboration and the barriers and benefits to remote online adjuncts. As the reach of online learning expands, more institutions of higher education will need to consider how to meet the adjuncts' needs for socialization, professional development, and virtual collaboration. The aim of this study was to extract the lived experiences of remote online adjuncts and better understand their lived experiences.

One of the most surprising findings of this study was that although trust was a concern for the participants, many of them declared that they were more willing to share with their peers in a virtual setting than face-to-face. The remote adjuncts reported giving a high sense of trust to their virtual collaboration partners from the onset of the partnership or group formation.

The results of this phenomenological study contribute to the body of knowledge of virtual collaboration among remote online adjuncts. Online and brick and mortar universities greatly depend on remote adjuncts to teach online classes. Attention needs to be paid to this population because of the integral role they have on the large population of online students. Finding ways to optimize adjuncts' professional development and connection to the online university is imperative.

Furthermore, while this study confirmed themes presented in current research, it also revealed new considerations about virtual collaboration. Some of the new discoveries included the need for leadership to create clear roles, connect collaborators, and create opportunities for collaboration. Another discovery was the desire for remote online adjuncts to use virtual collaboration to share in the pursuits of academic research and fellowship. Other findings included the importance of virtual collaboration as a gateway for self-reflection and as a means of pride. Additionally, a new barrier revealed was the pressure remote online adjuncts feel to collaborate. Finally, the study's discoveries provide potential direction for future research, including how to optimize the social needs of remote online adjuncts.

The benefits of virtual collaboration make it crucial to find solutions to the barriers. This study has shown that virtual collaboration affords faculty with the ability to be learners while simultaneously improving their morale and providing the opportunity for self-reflection. Remote online adjuncts experience isolation and the benefits of virtual collaboration yield valuable outcomes, including a social connection, a sense of pride, a feeling of camaraderie, and a chance to engage in scholarship. Virtual collaboration influences best practices, removes isolation, and offers a means for professional development, and is a highly valuable experience for the remote online adjunct.

REFERENCES

- Alderton, E., Brunzell, E., & Bariexca, D. (2011). The end of isolation. *MERLOT Journal of Online Learning and Teaching*, 7(3). Retrieved from http://jolt.merlot.org/vol7no3/alderton_0911.htm
- Ali, N., Hodson-Carlton, K., Ryan, M., Flowers, J., Rose, M., & Wayda, V. (2005). Online education: Needs assessment for faculty development. *The Journal of Continuing Education in Nursing*, 36(1), 32-38. Retrieved from <http://www.westga.edu/~distance/ojdla/fall103/mcquiggan103.htm>

- Allen, I. E., & Seaman, J. (2010). Class differences: Online education in the United States, 2010. *The Babson Surveying Research Group, the Sloan Consortium*. Retrieved from http://sloanconsortium.org/publications/survey/class_differences
- Anderson, T., & Kanuka, H. (1997). On-line Forums [1]: New platforms for professional development and group collaboration. *Journal of Computer-Mediated Communication*, 3(3), 0-0. doi: 10.1111/j.1083-6101.1997.tb00078.x
- Austin, A.E. and Baldwin, R.G. (1991). Faculty collaboration: enhancing the quality of scholarship and teaching. (ASHE-ERIC Higher Education Report No. 7). Washington, DC: The George Washington University.
- Bandura, A. (1977). *Social Learning Theory*. New York, NY: General Learning Press.
- Bandura, A. (1991). Social cognitive theory of moral thought and action. In W. M. Kurtines & J.L. Gewirtz (Eds.), *Handbook of moral behavior and development* (Vol. 1, pp. 45-103). Hillsdale, NJ: Erlbaum.
- Bandura, A.(2006). On integrating social cognitive and social diffusion theories. In A Singhal & J. Dearing (Eds.). *Communication of innovations: A journey with Ev Rogers*. Beverley Hills; Sage Publications. Retrieved from <http://www.uky.edu/~eushe2/Bandura/Bandura2006SinghalDearing.pdf>
- Baghdadi, Z. D. (2011). Learning community in online education. *Turkish Online Journal Of Distance Education (TOJDE)*, 12(4), 12-16. Retrieved from http://www.tojde.anadolu.edu.tr/tojde45/notes_for_editor_2.htm
- Bauerlein, M. (2011). *The Digital Divide*. New York, NY: Tarcher/Penguin.
- Berry, B., Norton, J., & Byrd, A. (2007, September). Lessons from networking. *Educational Leadership*, 48-52. Retrieved from <http://www.ascd.org/publications/educational-leadership/sept07/vol65/num01/Lessons-from-Networking.aspx>
- Betts, K. S. (2009). Online human touch (OHT) training and support: A conceptual framework to increase faculty and adjunct faculty engagement, connectivity, and retention in online education, Part 2. *Journal of Online Learning and Teaching*, 5(1), 29-48. Retrieved from http://jolt.merlot.org/vol5no1/betts_0309.htm
- Bingham, T., & Conner, M. (2010). *The new social learning*. SF: BK Publish.
- Blankenstein, A. (2010). *Failure is not an option*. Thousand Oaks, California: Corwin.
- Bonk, C. J. (2002, January). Online teaching in an online world. *United States Distance Learning Association (USDA)*, 16(3), 1-149. Retrieved from http://www.usdla.org/html/journal/JAN02_Issue/article02.html
- Bowditch, J., Buono, A. F., & Stewart, M. (2008). *A primer on organizational behavior* (7th ed.). Hoboken, NJ: John Wiley.
- Brabazon, T. (2002). *Digital hemlock: Internet education and the poisoning of teaching*. Sydney, Australia: UNSW.
- Brooks, C., & Gibson, S. (2012). Professional learning in a digital age. *Canadian Journal of Learning and Technology*, 38(2), 1-16.
- Brown, H. G., Poole, M. S., & Rodgers, T. L. (2004). Interpersonal traits, complementarity, and trust in virtual collaboration. *Journal of Management Information Systems*, 20(4), 115-137. Retrieved from <http://mesharpe.metapress.com/openurl.asp?genre=article&issn=0742-1222&volume=20&issue=4&spage=115>
- Center for Community College Student Engagement. (2010). *The Heart of Student Success: Teaching, Learning, and College Completion* (2010 CCCSE Findings). Austin, TX: The University of Texas at Austin, Community College Leadership Program. Retrieved from http://www.ccsse.org/publications/national_report_2010/36379tw/CCCSE_2010_national_report.pdf
- Chen, C., Wu, J., Ma, M., & Knight, m. (2011). Enhancing virtual learning team performance: A leadership perspective. *Human Systems Management*, 30(2011), 215-228. doi:10.3233/HSM-2011-0750
- Coughlin, E., & Kadjer, S. (2009). The impact of online collaborative learning on educators and classroom

- practices. Los Angeles, CA: Cisco Systems.
- Creswell, J.W. (2007). *Qualitative Inquiry & Research Design: Choosing Among Five Approaches* (2nd ed.). Thousand Oaks, CA: Sage.
- Creswell, J. W. (2009). *Research design:Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: Sage.
- Davis, B., & Resta, V. (2002). Online collaboration: Supporting novice faculty as researchers. *Journal of Technology and Teacher Education*, 10(1), 101-117. Retrieved from <http://www.editlib.org/p/9305>.
- DeRosa, D., Hantula, D., Kock, N., & D'Arcy, J. (2004). Trust and leadership in virtual teamwork: A media naturalness perspective. *Wiley Periodicals*, 43, 219-232. doi:10.1002/hrm. 20016
- Digenti, D. (1998). Toward an understanding of the learning community, *Organization Development Journal*, 16(2), 91-96. Retrieved from http://scholar.googleusercontent.com/scholar?q=cache:wjK3H-76uf0J:scholar.google.com/&hl=en&as_sdt=0,27
- Dittman, D. R., Hawkes, M., Deokar, A. V., & Sarnikar, S. (2010). Improving virtual team collaboration outcomes through collaboration process structuring. *The Quarterly Review*, 11(4), 195-209. Retrieved from <http://www.eric.ed.gov/ERICWebPortal/detail?accno=EJ947301>
- Dolan, V. (2011). The isolation of online adjunct faculty and its impact on their performance. *International Review of Research in Open and Distance Learning*, 12(2), 62-77. doi:10.1016/j.iheduc.2009.05.001
- Donnison, S., Edwards, D., Itter, D., Martin, D., & Yager, Z. (2009). Reflecting on improving our practice: Using collaboration as an approach to enhance first year transition in higher education. *Australian Journal of Teacher Education* 34(3), 18-29. Retrieved from <http://ro.ecu.edu.au/ajte/vol34/iss3/2/>
- Duncan-Howell, J. (2010). Faculty making connections: Online communities as a source of professional learning. *British Journal of Educational Technology*, 41, 324-340. doi:10.1111/j.1467-8535.2009.00953.x
- Dufour, R. (2004). Schools as learning communities. *Educational Leadership*, 61(80), 6-11. Retrieved from www2.ed.gov/programs/slcp/cptresources.pdf
- Esterberg, K. G. (2002). *Qualitative methods in social research*. Toronto, ON: McGraw-Hill.
- Farooq, U., Schank, P., Harris, A., Fusco, J., & Schlager, M. (2008). Sustaining a community computing infrastructure for online teacher professional development: A case study of designing Tapped In. *Computer-Supported Cooperative Work*, 16(4), 397-429. doi: 10.1007/s10606-007-9049-0
- Fichter, D. (2005). The many forms of e-collaboration: Blogs, wikis, portals, groupware, discussion boards, and instant messaging. *Online*, 29(4), 48-50. Retrieved from <http://pm440.pbworks.com/f/many+forms+of+e-collaboration+blogs+wikis+portals.pdf>
- Fuchs, C. (2011). Constraints and affordances of a collaborative online tool in language teacher education. *International Journal of Technology in Teaching and Learning*, 7(2), 152-173. Retrieved from http://www.sicet.org/journals/ijttl/issue1102/5_Fuchs.pdf
- Fullan, M. (2006). *Change theory: A force for school improvement*. Seminar series no. 157. Centre for Strategic Education. Retrieved from http://www.catalyst-chicago.org/sites/catalyst-chicago.org/files/michael_fullen_change_theory.pdf
- Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2 (2-3), 87-105. doi:10.1016/S1096-7516(00)00016-6
- Ge, X., Yamashiro, K., & Lee, J. (2000). Pre-class planning to scaffold students for online collaborative learning activities. *Educational Technology and Society*, 3(3), 1-16. doi: 10.1.1.80.3565
- Greene, C. H. (2008). The role of socially constructed shared knowledge in learning to teach: collaboration and reflection in a computer-mediated environment. *The Teacher Educator*, 43(1), 1-28. doi:10.1080/08878730701728747
- Harris, H. S., & Martin, E. W. (2012). Student motivations for choosing online classes. *International Journal for*

- the Scholarship of Teaching & Learning, 6(2), 1-8. Retrieved from http://academics.georgiasouthern.edu/ijstol/v6n2/articles/PDFs/Acc%20Art_Harris%20&%20Martin.pdf
- Hawkins, A., Barbour, M. K., & Graham, C. (2012, April). Everybody is their own island: Teacher disconnection in a virtual school. *The International Review of Research in Open and Distance Learning*, 13(2), 123-144. Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/967/2143>
- Hemetsberger, A., & Reinhardt, C. (2009). Collective development of open-source communities: An activity theoretical perspective on successful online collaboration. *Organization Studies*, 30, 987-1008. doi:10.1177/01708040609339241
- Hewett, B., & Powers, C. (2007). Online teaching and learning: preparation, development, and organizational communication. *Technical Communication Quarterly*, 16(1), 1-11. Retrieved from www.ncte.org/library/NCTEFiles/PD/Consulting/Vita_Hewett.pdf
- Hu, R., Caron, T., Deters, F., Moret, L., & Swaggerty, E. (2011, March). Teacher educators teaching and learning together: A collaborative self-study of support within an online literacy learning community. *MERLOT Journal of Online Learning and Teaching*, 7(1), 57-67. Retrieved from jolt.merlot.org/vol7no1/hu_0311.pdf
- Hughes, S. C., Wickersham, L., Ryan-Jones, D. L., & Smith, S. A. (2002). Overcoming social and psychological barriers to effective on-line collaboration. *Educational Technology & Society*, 5(1), 86-92
- Jarvenpaa, S. J., & Leidner, D. E. (1999). Communication and trust in global virtual teams. *Organization Science*, 10, 791-815. doi: 10.1111/j.1083-6101.1998.tb00080.x
- Kabilan, M., Adlina, W., & Embi, M. (2011). Online collaboration of English language faculty for meaningful professional development experiences. *English Teaching: Practice and Critique*, 10(4), 94 – 115. Retrieved from <http://education.waikato.ac.nz/research/files/etpc/files/2011v10n4art6.pdf>
- Keramidas, C, Ludlow, B., Collins, B., & Baird, C. (2007). Saving your sanity when teaching in an online environment: Lessons learned. *Rural Special Education Quarterly*, 26(1), 28-39. Retrieved from http://vega.jeffco.edu/szak/handouts/Saving_Your_Sanity_When_Teaching_In_An_Online_Environment.pdf
- Kezar, A. & Lester, J. (2009). *Organizing higher education for collaboration: A guide for campus leaders*. Jossey-Bass.
- Kim, K., & Bonk, C. J. (2006). The future of online teaching and learning in higher education: The survey says. *EQ Educause Quarterly*, 29(4). Retrieved from <http://www.educause.edu/EDUCAUSEQuarterly/EDUCAUSEQuarterlyMagazineVolum/TheFutureofOnlineTeachingandLe/157426>
- Kudaravalli, S., & Faraj, S. (2008). The structure of collaboration in electronic networks. *Journal of the Association for Information Systems*, 9, 706-726. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.183.3334&rep=rep1&type=pdf>
- LinkedIn. (n.d). LinkedIn facts page. Retrieved from <http://www.linkedin.com/>
- McCarthy, S. A., & Samors, R. J. (2009, August). Online Learning. SLOAN-C | The Sloan Consortium. Retrieved from http://sloanconsortium.org/publications/survey/staying_course
- McConnell, T. J., Parker, J. M., Eberhardt, J., Koehler, M. & Lundeberg, M. (2012). Virtual professional learning communities: Faculty' perceptions of virtual versus face-to-face professional development. *Journal of Science Education and Technology*. doi:10.1007/s10956-01209391-y
- McLean, J. (2006). Forgotten faculty: Stress and job satisfaction among distance educators. *Online Journal of Distance Learning Administration*, 9(2). Retrieved from: <http://www.westga.edu/~distance/ojdla/summer92/mclean92.htm>
- Moore, J. C. (2006). Collaboration online: Sloan-C Resources. *Journal of Asynchronous Learning Networks*, 10(1), 81-89. Retrieved from <http://sloanconsortium.org/jaln/v10n1/collaboration-online-sloan-c-resources>

- National Commission on Teaching and America's Future. (2002, August). Unraveling the "teacher shortage" problem: Teacher retention is key. Paper presented at the Unraveling the "Teacher Shortage" Problem Symposium, Washington, DC. Retrieved from http://www.ncsu.edu/mentorjunction/text_files/teacher_retentionsymposium.pdf
- Ormrod, J. E. (2003). Lifespan development and learning. City, state: Prentice-Hall.
- Paloff, R., & Pratt, K. (2005). Learning together in community: Collaboration online. In 20th Annual Conference on Distance Teaching and Learning (pp. 4-6). Retrieved from www.oakland.k12.mi.us/Portals/0/Learning/04_1127.pdf
- Puzziferro-Schnitzer, M. (2005). Managing virtual adjunct faculty: Applying the seven principles of good practice. *Online Journal of Distance Learning Administration*, 8(2). Retrieved from <http://www.westga.edu/%7Edistance/ojdl/summer82/schnitzer82.htm>
- Ragoonaden, K., & Bordeleau, P. (2000). Collaborative learning via the internet. *Educational Technology and Society*, 3(3), 1-16. Retrieved from http://www.ifets.info/others/journals/3_3/d11.html
- Reichstetter, R. (2006). Defining a professional learning community: A literature review. *E&R Research Alert*. Retrieved from http://www.wcpss.net/evaluation-research/reports/2006/0605plc_lit_review.pdf
- Rice, K., & Dawley, L. (2007). Going virtual: The status of professional development for K-12 online faculty. Boise, ID: Boise State University. Retrieved from <http://edtech.boisestate.edu/goingvirtual/goingvirtual1.pdf>
- Roberts, C., Thomas, M., McFadden, A., & Jacobs, J. (2006). Leading online learning through collaboration. *MERLOT Journal of Online Learning and Teaching*, 217-225. Retrieved from <http://jolt.merlot.org/vol2no3/roberts.htm>
- Sarker, S., & Sahay, S. (2003). Understanding virtual team development: An interpretive study. *Journal of the Association for Information Systems*, 41-36. Retrieved from <http://heim.ifi.uio.no/~in364/docs/sarker.pdf>
- Scarpetta, F. (2008). Practices to display social presence: A study in a shared mediated environment. *Psychology Journal*, 6(1), 27-59. Retrieved from [http://www.psychology.org/File/PNJ6\(1\)/Psychology_journal_6_1_Scarpetta.pdf](http://www.psychology.org/File/PNJ6(1)/Psychology_journal_6_1_Scarpetta.pdf)
- Schlager, M., Farooq, U., Fusco, J., Schank, P., & Dwyer, N. (2009) Analyzing online social networking in professional learning communities: Cyber networks require cyber-research tools. *Journal of Technology Education*, 60(1), 86-100. doi:10.1177/0022487108328487
- Schunk, D. H. (2008). *Learning theories. An educational perspective* (5th ed.). Upper Saddle River, NJ: Pearson.
- Scribner-MacLean, M., & Miller, H. (2011). Strategies for success for online co-teaching. *MERLOT Journal of Online Learning and Teaching*, 7(3). Retrieved from http://jolt.merlot.org/vol7no3/scribner-maclean_0911.htm
- Seddon, K., Skinner, N., & Postlethwaite, K. (2008). Creating a model to examine motivation for sustained engagement in online communities. *Education and Information Technologies*, 13, 17-34. doi:10.1007/s10639-007-9048-2
- Shattuck, J., Dubins, B., & Zilberman, D. (2011). Maryland Online's Inter-Institutional Project to Train Higher Education Adjunct Faculty to Teach Online. *International Review of Research In Open & Distance Learning*, 12(2), 40-61. Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/933>
- Shea, P. (2007). Bridges and barriers to teaching online college courses: A study of experienced online faculty in thirty-six colleges. *Journal of Asynchronous Learning Networks*, 11(2), 73-128. Retrieved from <http://faculty.weber.edu/eamsel/Research%20Groups/Online%20Learning/BridgesandBarriersTeachingOnline.pdf>
- Sistek-Chandler, C. (2012). Connecting the digital dots with social media and Web 2.0 technologies. *Journal of Research in Innovative Teaching*, 5(1), 78-87. Retrieved from <http://www.nu.edu/assets/resources/pageResources/journal-of-research-in-innovative-teaching-volume-5.pdf#page=87>

- Stevenson, C. B., Duran, R. L., Barrett, K. A., & Colarulli, G. C. (2005). Fostering faculty collaboration in learning communities: A developmental approach. *Innovative Higher Education*, 30(1), 23-36. Retrieved from <http://link.springer.com/article/10.1007/s10755-005-3293-3#page-1>
- U.S. Department of Education. (2010). Enrollment of the 120 largest degree-granting college and university campuses, by selected characteristics and institution. Retrieved from http://nces.ed.gov/programs/digest/d11/tables/dt11_249.asp
- Vallance, M., Towndrow, P., & Wiz, C. (2010, January/February). Conditions for successful online document collaboration. *TechTrends*, 54(1), 20-24. doi: 10.1007/s11528-009-0359-6
- Vygotsky, L. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
- Wolf, P.D. (2006). Best Practices in the training of faculty to teach online. *Journal of Computing in Higher Education*, 17(2), 47-48. doi:10.1007/BF03032698
- Xu, J., Zhang, J., Harvey, T., & Young, J. (2008). A survey of asynchronous collaboration tools. *Information Technology Journal*, 7, 1182-1187. Retrieved from <http://docsdrive.com/pdfs/ansinet/itj/2008/1182-1187.pdf>
- Yin, R. K. (2008, October). *Case study research: Design and methods*: [Kindle PC Version]. Sage Publications. Retrieved from Amazon.com