

CHALLENGES IN THE ONLINE LEARNING OF ECONOMICS

Samina Saghir

Virtual University of Pakistan
samina_saghir@vu.edu.pk

Kanwal Zahid

Virtual University of Pakistan
kanwal_zahid@vu.edu.pk

Amina Tabassum

Virtual University of Pakistan
amina.tabassum@vu.edu.pk

Zafar Iqbal

Virtual University of Pakistan
zafar.iqbal@vu.edu.pk

Munazza Ahmed

Virtual University of Pakistan
munazza.ahmed@vu.edu.pk

Hira Liaquat

Virtual University of Pakistan
hira.liaquat@vu.edu.pk

ABSTRACT

Online education has become a popular channel for students to pursue their studies not only in developed countries but also in developing countries. This trend is growing impressively but it also brings about some challenges. This study attempts to identify the key challenges faced by students in the online learning of economics. For this purpose, survey data of one hundred and thirty two students from the economics department of Virtual University of Pakistan was collected and then analysed using Statistical Package for the Social Sciences. The main factors which are examined in the study are course contents, learning management system, communication skills, student-teacher communication gap and drawing of graphs. The findings enable us to propose solutions to overcome the problems of online learning of economics, which can be helpful for both universities and students to improve the learning of economics subjects.

Keywords: *Learning Management System, distance learning, student-teacher interaction, education*

INTRODUCTION

Information technology has caused a revolution in higher education and all sectors of society including the educational sector, which have benefitted from the developments in Information and Communication Technologies (ICTs) (Sife, Lwoga, and Sanga, 2007). Since the mid to

late 1990s, the World Wide Web has been used as a disseminated learning mechanism, enhancing the digital learning environment to support distance and on-campus students. In recent years, interest has been increased to envisage how internet and computers can be used to enhance the efficiency and effectiveness of education at all levels (Tinio, 2003). A large number of institutions in different countries have offered online courses and degree programmes (Coates, Humphreys, Kane, & Vachris, 2004) and this revolution has opened the doors for researchers to measure the efficiency of this approach. These changes in distance education have been developed in an attempt to provide easier access to educational opportunities for students who are located at a distance from the university, who are working or who have other constraints such as family commitments.

Online education has been offered in different institutions in a formal context to teach various subjects. Online learning has been described as a solution to some of the educational challenges. Most of the studies have focused on teachers' perspectives regarding teaching and developing of online courses (Berge, 1997) while just a few studies have elaborated on learners' perspectives of online learning (Hara, 2000). In recent years, the demand to provide many post-secondary subjects, including economics, in the online mode is increasing. Learning in economics courses remains challenging for both instructors and students as it is very difficult to teach economics from a distance as compared to teaching in live mode due to several reasons; for example, developing and assessing students' cognitive skills is not easy when the students are at a distance (Katz & Becker, 1999). On the students' side, there are different challenges, such as communication problems, drawing of graphs, time management and taking exams in online mode.

There are currently 179 higher education institutions in Pakistan recognised by the Higher Education Commission. Many of these universities utilise the conventional mode of study, which limits their ability to cater to the public's need for higher education. Many people in Pakistan live in rural areas and it is not possible for them to get admission into these institutions due to reasons such as high cost, social family values and lack of opportunity. Moreover, many adults are employed and thus do not have time to attend classes. Therefore, distance education is playing an increasingly important role in Pakistan to provide access to higher education for all members of society. Virtual University of Pakistan, a public university, was established in 2002 to provide opportunity to those who are not able to access conventional education. Virtual University of Pakistan relies wholly on modern Information and Communication Technologies to deliver quality education as per international standards. The university serves students by offering different degree programmes in various subjects, including economics. The purpose of this paper is to identify the challenges faced by students in the online learning of economics. In addition, this study aims to identify how students can improve their academic performance. Using a questionnaire for data collection, the main problems faced by the students during online learning are investigated. This paper aims to provide insights for online economics' teachers to enable more effective teaching of economics courses in the online mode of study.

LITERATURE REVIEW

A widespread debate has begun to emerge among academics regarding internet technology. Research conducted in the mid-1990s focused on class room teaching and limited itself to a few aspects of web-based learning. Gregor and Cuskelly (1994) found that notice boards gave a positive impact on students while some researchers preferred e-mail (Manning, 1996). Vachris (1999) states that there is little difference between face-to-face and web-based learning but Agarwal and Day (1998) state that the addition of net material makes a positive impact on students' learning. Becker (1997) has conducted an efficiency analysis of online teaching of economics courses and comments that computers cannot be good

substitutes to human capital. Nowadays, lectures through web delivery are increasing and are considered as a vehicle of learning. There is also an increase in economics courses being offered in online mode, whether completely or partly (Katz and Becker, 1999).

Quality is a very important factor when imparting knowledge in all courses and degree programmes, irrespective of the environment in which it is being delivered. Student satisfaction and faculty satisfaction are considered important pillars of quality (Lorenzo & Moore, 2002). Furthermore, Bolliger (2004) has identified three factors which effect student satisfaction in the online method of teaching, which are teacher, technology and human computer interaction.

While some studies have identified positive aspects of online learning, others have identified negative aspects. For example, Combes and Anderson (2006) found that students in online learning courses have to work in isolation and they suffer from feelings of disquiet, deficiency of optimism and frustration. In contrast, Sosin and Goffe (2006) provide an overview of the arguments in favour of online learning. Moreover, an online class provides faster information access, it can be planned to accommodate different learning styles and student types, and it encourages students to take a more responsible productive role in the learning process (Brewer and Erickson, 1997; Zhang, 1998). Murphy and Collins (1997) state that convenience is the main advantage of online learning as students can participate in discussions at any time which is suitable to them. They can also get course material without visiting the campus.

Despite the importance of online economics education, there are only a few studies which have highlighted and analysed the relevant issues in order to improve the online learning of economics. Denis and Hubert (2001) conducted an experimental study to explain the differences in students learning of economics courses between face-to-face and online education systems. The study selected data from students who attended both face-to-face classes and online economics courses at three institutions and estimated online production function using the 2SLS technique. The results of the study indicate that students having identical characteristics would perform better in face-to-face classes than they would in online economics education courses. Students learning in the face-to-face mode scored better results in the Test of Understanding College Economics (TUCE) than students learning in the online mode of education.

Brown and Liedholm (2002) measured student performance in three different modes (face-to-face, blended and virtual) of teaching in the subject of microeconomics. Components of teaching in all modes were the same, such as reading material, mode of examination and mode of interaction among teachers and students. This study comprised 363 students in face-to-face sessions, 258 students from blended courses and 89 students from two semesters in the on-line course. In this study, students' scores were taken as dependent variables and modes of learning as independent variables. They found that student's performance in distance learning of microeconomics was worse when compared to that in live sessions.

According to Sosin and Goffe (2006), there is a widespread use of technology in many institutions as a complement to face-to-face teaching. They emphasise that blended teaching may enhance the students learning outcomes and use of computer technology for the learning of economics courses will continue to increase.

Jacobs (2013) investigated the challenges for instructors in teaching online courses, whereby, giving timely and detailed feedback to students, uploading complete information related to course material on the website and student's motivation were found to be important challenges for the instructors. Islam, Beer and Slack (2015) studied e-learning challenges faced by higher education institutes by exploring the challenges face by

Middlesex University in e-learning. They highlighted that grasp on use of technology for e-learning; students' attitude and training of teachers in identifying students' needs are the critical challenges which every institute should consider for successful learning in the online mode of study.

Existing studies measures learner's perspective of online learning of computer science, biology and accounting subjects but not on challenges of online learning of economics. To fill this gap, this paper studies the challenges of online learning of economics and how these challenges can be addressed for the better performance of students.

RESEARCH OBJECTIVES

This paper is guided by the following research objectives:

- (1) To identify the main challenges faced by students in the online learning of economics.
- (2) To compare the participants' responses according to gender using bivariate analysis.
- (3) To analyse the reasons and suggestions made by the students in their responses to open ended questions.

RESEARCH DESIGN

Data Sources

To identify the key challenges faced by students in the online learning of economics, survey data was collected from students of Virtual University of Pakistan. Students who were enrolled in the microeconomics basics course in the fall semester 2015 were selected for this study. The total student enrollment in this course was 1108 students. A questionnaire link was shared with all students through email and responses were received from one hundred and thirty two students. All students filled the questionnaire voluntarily. In the questionnaire, open ended questions were also added to collect additional information regarding students' problems and their suggestions to improve the online learning of economics.

Background Variables

Questions were asked on the main factors which can cause challenges for students in effectively understanding the extent of the online economics course. The main factors found were lack of English communication and writing skills, lengthy course contents, difficulty in drawing and understanding of graphs, student-teacher interaction gap and the learning management system of the university. Questions were developed on the basis of these factors using a 5-point-Likert scale where responses were placed from highest to lowest order. In the Likert scale, 1 represents 'strongly agree' and 5 represents 'strongly disagree'.

Methodology

The collected data was entered into SPSS software. Analysis of the data was then done in four stages. In first stage, we analysed the demographic profile of the participants. In second stage, we computed the frequency counts and percentages of students' responses to the questions. In the third stage, we conducted bivariate analysis of responses according to gender using chi-square test. In the fourth stage, analysis of the responses to open-ended questions on potential reasons to leave the course and suggestions was done.

RESULTS AND DISCUSSIONS

The basic objective of this paper is to analyse the various challenges faced by distance education students in the online learning of economics and to propose basic solutions to address these challenges. Table 1 briefly describes the demographical information of the respondents. Of the 132 respondents, 73 (55.3%) respondents were male students and 59 (44.7%) were female students. In terms of age, most students were below 30, with 10 students between the ages of 30 and 40 (7.6%) and 2 students aged between 41 and 50 (1.5%). It is noted that only one respondent beyond the age of 50 was taking this course. In Pakistan, few people study after the age of 50 as they are expected to support their families at this age. Of the respondents, 23 (17.4%) students were working while studying and 109 (82.6%) students were not employed. As it has been observed that 119 out of 132 students were under 30, it can be expected that the majority of students were not employed. In terms of programme enrollment, 67.4% of the respondents were enrolled in a bachelors' degree programme, 33 (25%) students in an associate degree programme, 7 (5.3%) students in a Master's degree programme and just one student taking an MS/M.Phil. programme. Two respondents did not provide details of their course enrolment.

Table 1: Demographic Profile of the Participants

| Variable | Characteristics | Frequency | Percentage (%) |
|------------|------------------|-----------|----------------|
| Gender | Male | 73 | 55.3 |
| | Female | 59 | 44.7 |
| Age | Less than 30 | 119 | 90.2 |
| | 30-40 | 10 | 7.6 |
| | 41-50 | 2 | 1.5 |
| | More than 50 | 1 | 0.8 |
| Job status | Yes | 23 | 17.4 |
| | No | 109 | 82.6 |
| Education | Bachelors | 89 | 67.4 |
| | Associate degree | 33 | 25 |
| | Masters | 7 | 5.3 |
| | MS/M. Phil | 1 | 0.8 |
| | Missing | 2 | 1.5 |
| Total | | 132 | 100 |

Next, students' responses to the questionnaire were analysed according to five factors: student-teacher communication gap, difficulty in drawing and understanding graphs, English as a barrier of good grades, lengthy and difficult course contents and Learning management System.

Table 2: Student-teacher communication gap

| Responses | Frequency | Percent |
|-----------|-----------|---------|
| Agree | 99 | 75 |
| Undecided | 19 | 14.4 |
| Disagree | 14 | 10.6 |
| Total | 132 | 100 |

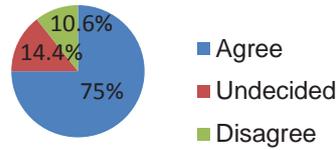


Figure 1: Student-teacher communication gap

Table 2 shows majority of respondents (75%) agreed that student-teacher communication gap is an important factor which made learning difficult in the online mode of study. Students were unable to gain an in-depth understanding of the economic concepts and their applications due to the lack of a virtual class room discussion. Therefore, they were less motivated towards their studies and could not perform better. Qureshi, Ilyas, Yasmin, and Whitty (2012) confirm that need of students to have personal engagement with instructors is a significant factor in student satisfaction and e-learning often lacks face-to-face interaction, which students can have in traditional education systems.

Table 3: Difficulty in drawing and understanding graph

| Responses | Frequency | Percent |
|-----------|-----------|---------|
| Agree | 101 | 76.5 |
| Undecided | 10 | 7.6 |
| Disagree | 21 | 16 |
| Total | 132 | 100 |

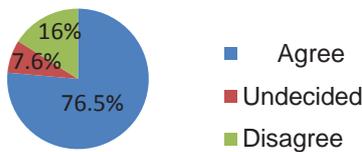


Figure 2: Difficulty in drawing and understanding graph

Our results show that the drawing and understanding of graph is very difficult in the online learning of economics. Table 3 shows that a majority of respondent (76.5%) confirmed that drawing and understanding graphs was one of the major problems in understanding the content of economics, in which understanding graphs is considered an important factor in the understanding of concepts. In contrast, 16% of the students disagreed that understanding and drawing of graphs is an issue in the online learning of economics. The remaining 7.6% of respondents gave neutral response to this question. This finding was also confirmed by students' responses to the open-ended questions, in which they confirmed that the understanding and drawing of graphs is a major reason to leave this course. In an online learning system, the drawing and understanding of graphs is very difficult for students, which in turn will make this subject more difficult for them. Students from remote areas do not have a strong grasp of basic IT skills and are unable to draw graphs in an online system in spite of repeated guidelines from the course instructor.

Table 4: English as a barrier to good grades

| Responses | Frequency | Percent |
|-----------|-----------|---------|
| Agree | 61 | 46.2 |
| Undecided | 19 | 14.4 |
| Disagree | 52 | 39.3 |
| Total | 132 | 100 |

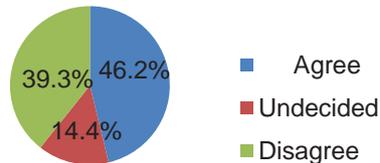


Figure 3: English as a barrier to good grades

Table 4 shows that 46.2% of the respondents were agreed that English is a barrier to getting good grades. Due to a lack of communication and writing skills, they were unable to fully participate in posting MDBs¹ and graded activities like assignments, quizzes and GDBs². Qureshi et al. (2012) and Shraim and Khlaif (2010) also confirm that students' proficiency in English is a significant issue. In contrast, 39.3% of respondents did not agree that English is the main barrier to good grades. The remaining 14.4% of students did not give any response for this question. Virtual University of Pakistan is providing higher education opportunity to people in all areas of the country including remote areas. Students come from different educational backgrounds and many students do not have good English communication skills due to low standards of schooling and therefore, face more difficulty in an online study environment.

Table 5: Lengthy and difficult course contents

| Responses | Frequency | Percent |
|-----------|-----------|---------|
| Agree | 74 | 56 |
| Undecided | 9 | 6.8 |
| Disagree | 49 | 37.2 |
| Total | 132 | 100 |

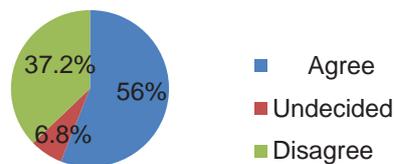


Figure 4: Lengthy and difficult course contents

¹ Moderated Discussion Board (MDB) is a platform available on the university's learning management system (LMS), which provides students an opportunity to ask different subject related questions on topics for which they require clarification. Course teachers provide answers to the students' queries so this forum is treated as communication window between the course teacher and students to bridge the gap of communication in distance education.

² Graded Discussion Board (GDB) is an activity which is basically used to provide students an opportunity to discuss and share their views on a topic and its applications. A scenario based question related to the particular subject is usually posted on GDB and students provide their answers and logically defend their view point. Students' comments are then marked by the respective teachers.

Our results identify lengthy course contents as one the main challenges that students face in the online learning of economics. Table 5 shows that a majority of respondent (56%) confirmed that lengthy course contents was a significant problem for them. They were unable to cover whole the whole syllabus and could not perform well in this subject. However, 37.2% respondents were of the view that lengthy course contents did not create any difficulty in students' learning. The remaining 6.8% respondents gave a neutral response to this question. Burton, Goldsmith, and Consortium (2002) found that students believe that the greatest challenge to online courses was lengthy and difficult course content, which students were unable to cover in the online mode of education.

Table 6 shows that a majority of students disagreed that the university's learning management system causes them difficulties. The university has made its learning system management system very simple and students can understand and use this online system of education without any difficulty.

Table 6: Learning Management System

| Responses | Frequency | Percent |
|-----------|-----------|---------|
| Agree | 26 | 20 |
| Undecided | 12 | 9 |
| Disagree | 94 | 71 |
| Total | 132 | 100 |

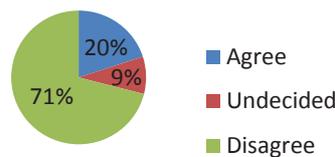


Figure 5: Learning Management System

For the comparison of participants' responses with respect to gender, cross tabs for all factors were computed using Pearson's chi-square test, the results of which are reported in Table 7. Results show that both males and females had the opinion that the student-teacher interaction gap, difficulty in drawing and understanding graphs and lack of English communication skills are important challenges for students in the online learning of economics because the chi-square value is insignificant for all these factors. However, the results show that there is a difference in opinion between males and females about lengthy course contents as an important challenge, as shown by significant chi-square value for this factor. Lengthy course contents cause more difficulty for female as compared to male respondent. This could be due to the fact that females have more household' responsibilities and they have to allocate time for their family and children.

Table 7: Results of Pearson chi-square test

| Factors | Gender | Responses (Frequency) | | | Pearson chi2(2) | Probability |
|--------------------------------------|--------|-----------------------|----------|-----------|-----------------|-------------|
| | | Agree | Disagree | Uncertain | | |
| Student-teacher communication gap | Male | 52 | 7 | 14 | 3.0653 | 0.216 |
| | Female | 47 | 7 | 5 | | |
| | Total | 99 | 14 | 19 | | |
| Lack of English communication skills | Male | 34 | 29 | 10 | 0.0641 | 0.968 |
| | Female | 27 | 23 | 9 | | |
| | Total | 61 | 52 | 19 | | |

| | | | | | | |
|-------------------------------------|--------|-----|----|----|--------|-------|
| Drawing and understanding of graphs | Male | 57 | 10 | 6 | 0.6433 | 0.725 |
| | Female | 44 | 11 | 4 | | |
| | Total | 101 | 21 | 10 | | |
| Online learning management system | Male | 11 | 54 | 8 | 2.578 | 0.276 |
| | Female | 15 | 40 | 4 | | |
| | Total | 26 | 94 | 12 | | |
| Lengthy course contents | Male | 37 | 27 | 9 | 8.1167 | 0.017 |
| | Female | 37 | 22 | 0 | | |
| | Total | 74 | 49 | 9 | | |

Our questionnaire also contained two open ended questions. The first question asked respondents to state potential reasons for wanting to quit the course. Table 8 shows that a majority pointed towards the lack of interaction between students and teachers as the main cause of quitting this course while a large number of respondents were of the view that difficulty in drawing and understanding graphs was the major reason. A few students mentioned that understanding the content of this course was difficult due to lack of time management, teaching style, understanding of learning management system of university, load shedding problem and online exam system. Students' response to the open ended questions reconfirmed the results of our study. A majority of students were of the view that the interaction gap between students and teachers and the drawing and understanding of graphs were the main challenges which made this subject difficult to understand in the online mode of study. Other important factors found in the study are English communication skills and lengthy course contents. Students learning can be made more effective by finding solutions to the challenges highlighted in the study.

Table 8: Reasons to leave course

| Challenges identified by students | Frequency | Percentage (%) |
|---|-----------|----------------|
| Lack of interaction b/w students and teachers | 36 | 27.3 |
| Difficult graphs | 21 | 15.9 |
| Lengthy course | 9 | 6.8 |
| Language as a barrier | 7 | 5.3 |
| Handouts are not proper | 5 | 3.8 |
| Teaching style is not good | 5 | 3.8 |
| LMS is difficult | 5 | 3.8 |
| Difficult exams system | 1 | 0.8 |
| Lack of time management | 2 | 1.5 |
| Load shedding problem | 1 | 0.8 |
| Personal reasons | 7 | 5.3 |

The second open-end question asked respondents to provide suggestions for the betterment of the online learning of economics. The results are shown in Table 9. A majority of respondents suggested that student-teacher interaction sessions should be conducted for the better understanding of economics concepts. Respondents also suggested that more and clearer explanations of the graphs should be added to the lectures as well as in the handouts. A few students suggested that lecture contents and the duration of lecture should be reduced. Also, lectures can be made more understandable by using easy language.

Table 9: Suggestions for betterment of online learning of economics

| Suggestions | Frequency | Percentage (%) |
|---|-----------|----------------|
| Student-teacher interaction | 53 | 40.2 |
| Explanation of graph + Practice questions | 21 | 15.9 |
| Lecture should be short | 5 | 3.8 |
| Lectures should be few | 1 | 0.8 |
| Course content should be easy | 4 | 3 |
| Language should be easy | 5 | 3.8 |
| Exam software should be updated | 3 | 2.3 |
| Weekly quiz | 1 | 0.8 |

CONCLUSION

Distance Education in the online mode is now gaining popularity in many countries including Pakistan but due to its numerous challenges it has not achieved the expected standard. The objective of the present study was to highlight the important factors which are the challenges for the online learning of economics and also suggest several implications for practice. Some possible approaches to tackling these challenges include the following:

- (1) There is a need to guide learners about the online mode of learning economics and graphs with the help of video tutorials. In these tutorials, graphs should be drawn using digital pen. Furthermore, these tutorials should be available on the course website.
- (2) There is a need to assist students regarding time management.
- (3) Students should be motivated through online student counselling.
- (4) Students understanding of the subject should be improved by conducting frequent student-teacher interaction sessions preferably through Skype sessions, Adobe sessions and face-to-face classes.
- (5) There is a need to facilitate the students in the online learning of economics as this is beneficial not only for our students but also for our nation.

In conclusion, it is necessary for the university to address the existing issues in order to improve online learning.

REFERENCES

- Agarwal, R., and Day, A. E. (1998). The impact of the Internet on economic education. *The Journal of Economic Education*, 29(2), 99-110.
- Becker, W. E. (1997). Teaching economics to undergraduates. *Journal of Economic Literature*, 35(3), 1347-1373.
- Berge, Z. (1997). Characteristics of online teaching in post-secondary, formal education. *Educational Technology*, 37(3).
- Bolliger, D. U. (2004). Key factors for determining student satisfaction in online courses. *International Journal on E-learning*, 3(1), 61-67.
- Brewer, S. M., and Erickson, D. R. (1997). A tale of two classrooms. *Journal of Computing in Teacher Education*, 13(3), 20-22.

- Brown, B. W., and Liedholm, C. E. (2002). Can web courses replace the classroom in principles of microeconomics? *American Economic Review*, 444-448.
- Burton, L. J., Goldsmith, D., and Consortium, C. D. L. (2002). *Students' Experiences in Online Courses: A Study Using Asynchronous Online Focus Groups*: Connecticut Distance Learning Consortium.
- Coates, D., Humphreys, B. R., Kane, J., & Vachris, M. A. (2004). "No significant distance" between face-to-face and online instruction: evidence from principles of economics. *Economics of Education Review*, 23(5), 533-546.
- Combes, B., and Anderson, K. (2006). Supporting first year e-learners in courses for the Information professions. *Journal of education for library and information science*, 259-276.
- Denis, B., and Hubert, S. (2001). Collaborative learning in an educational robotics environment. *Computers in Human Behavior*, 17(5), 465-480.
- Gregor, S. D., & Cuskelly, E. (1994). Computer mediated communication in distance education. *Journal of Computer Assisted Learning*, 10(3), 168-181.
- Hara, N. (2000). Student distress in a web-based distance education course. *Information, Communication & Society*, 3(4), 557-579.
- Islam, N., Beer, M., & Slack, F. (2015). E-learning challenges faced by academics in Higher Education. *Journal of Education and Training Studies*, 3(5), 102-112.
- Jacobs, P. (2013). The challenges of online courses for the instructor. *Research In Higher Education Journal*, 21, 1-18.
- Katz, A., & Becker, W. E. (1999). Technology and the teaching of economics to undergraduates. *The Journal of Economic Education*, 30(3), 194-199.
- Lorenzo, G., & Moore, J. (2002). The sloan consortium report to the nation: five pillars of quality online education. *The Sloan Consortium*. Lake George: New York. Retrieved from <http://www.edtechpolicy.org/ArchivedWebsites/Articles/FivePillarsOnlineEducation.pdf>
- Manning, L. M. (1996). Economics on the Internet: Electronic mail in the classroom. *The Journal of Economic Education*, 27(3), 201-204.
- Murphy, K. L., and Collins, M. P. (1997). Communication conventions in instructional electronic chats. *First monday*, 2(11).
- Qureshi, I. A., Ilyas, K., Yasmin, R., and Whitty, M. (2012). Challenges of implementing e-learning in a Pakistani university. *Knowledge Management & E-Learning: An International Journal (KM&EL)*, 4(3), 310-324.
- Shraim, K., and Khlaif, Z. (2010). An e-learning approach to secondary education in Palestine: opportunities and challenges. *Information Technology for Development*, 16(3), 159-173.
- Sife, A., Lwoga, E., & Sanga, C. (2007). New technologies for teaching and learning: Challenges for higher learning institutions in developing countries. *International Journal of Education and Development using ICT*, 3(2).

- Sosin, K., and Goffe, W. (2006). Using the internet and computer technology to teach economics. *Teaching economics: More alternatives to chalk and talk*, 109-132.
- Tinio, V. L. (2003). ICT in education. *e-primers for the information economy, society and polity*. Manila: E-ASEAN Task Force/UNDP-APDIP. Retrieved from http://wikieducator.org/images/f/ff/Eprimer-edu_ICT_in_Education.pdf
- Vachris, M. A. (1999). Teaching principles of economics without “chalk and talk”: The experience of CNU online. *The Journal of Economic Education*, 30(3), 292-303.
- Zhang, P. (1998). A case study on technology use in distance learning. *Journal of Research on Computing in Education*, 30(4), 398-419.