Does Online Learning Reflect on Traditional Class Performance?

Hanas Cader and Ali Aljamal

American University of Kuwait, Kuwait

College of Business and Economics, American University of Kuwait, P.O. Box 3323, Safat 13034, Kuwait. Phone: +965 2224-8399 ext. 550; email: mcader@auk.edu.kw.

Abstract

Variety of online learning platforms is available for academic practitioners. As the educators embrace different methods of online learning methods, the technological developments continue to improve and have been shaping the modern day education. The end result of the learning-technology interaction should be reflected on student learning outcomes. In this paper, we examine the student learning outcome resulting from online homework setup on a traditional classroom performance. A regression model is used to assess the impact of online homework scores on standardized test performance. The results show that online homework scores tend to have a significant but negligible impact on student final exam, while CGPA has a grater positive impact final exam.

Keyword: Online Learning, Economic Education, Ordinary Least Square (OLS)

1. Introduction:

Technology has become an integral part of education where the development of electronic technology and communication system have led to unprecedented possibilities and opportunities for teaching and learning. Online learning is gradually replacing traditional formal instruction. Instructors and educational institutions gradually embrace this trend resulting in improved instructions and efficiency in delivery. Although, there are many such online learning platforms available today, the Aplia®[1]online learning platform is very well known and widely used. Developed nations were early adopters of online learning systems while countries in middle-east are considered to be late adopters. But online learning expected to become popular as the countries educational systems transformed into western style educational system.

2. Literature Review

The recent development in online learning is characterized by a need bridge the gaps identified between learning theories, instructional design principles and student learning outcomes in higher education (Siragusa & Dixon, 2005). The instructional strategy to improve the student's learning experiences is facilitated by the internet which has provided significantly different and interesting possibilities for computer-meditated communication and learning from other forms of educational technologies (Weller, 2002). It is revealed by a study of Siragusa (2005) resulting from a survey of students and lecturers in Western Australian universities that numerous areas of students' online learning experiences perceived as being successful for those needing improvements. In a similar study conducted by Siragusa et al., (2007), twenty-four sets of recommendations were incorporated for wide ranging pedagogical needs of online learning existing, including online learning evaluation, Internet-based information, collaborative learning, Interaction, study flexibility – when, where, at what pace, accommodation of individual learning styles, content guiding learning strategies, development of learning strategies, lecturer's development activities, lecturer's online support and training[2].

[1] It was developed by economic professor Paul Romer at Stanford University in the late 1990s. His goal was to develop web-based platform to engage students by bridging the gap between textbook and the real world by using interactive chapter assignments, tutorial and experiments while avoiding the daunting task of processing paper flow and grading.

[2] Please see (Siragusa et al., 2007) for a comprehensive details and outline of these pedagogical needs of online learning existing in higher education.

Given the current literature on assessing the online learning experiences, research has mainly focused on evaluating the potential benefits of adopting of online learning. In a study, Taha (2010) has found that six perceived constructs that affect the use of online learning among university students, namely: usefulness, ease of use, availability, reliability, convenience and familiarity. Lee et al. (2009) have used Test of Understanding in College Economics (TUCE) scores to examine the students effects on online homework to the traditional instructor's assigned graded homework. The study results suggest that student achievement is neither adversely affected nor online homework had a positive impact.

3. Objective

In this paper, we examine the impact of online assignments (using software *Aplia*®) in traditional end of semester exam scores in the Principles of Macroeconomics course.

4. Data and Methodology

This study was conducted to assess the effectiveness of online learning assignments on students' performance in principle of macroeconomics classes in Kuwait. The study was based data from Fall 2007 to Spring 2014. The data cover regular Fall, Spring and Summer semesters. Course requirements for the different semesters were kept similar; and the students were assigned online assignments as part of the homework. Online assignment score accounts for 15% of the course grade. Apart from online assignments there were three midterms and a final exam. The final exam was a standardized test either TUCE[3] or IUPUI[4] to gauge students' achievements. The final exams were alternated between the two to avoid any possibility of cheating as about 10 to 20 percent of students tend to repeat the course as a result of failing in the previous semester. Online assignments score (APLIASCORE), cumulative grade point average (CGPA), cumulative earned credit hours (CECH), gender (GENDER), and a dummy variable for status of prior economic training (NOPRIOEC) were used as explanatory variable.

[3] Test of Understanding in College Economics (TUCE) - Macroeconomics, 4th edition was developed by the National Council on Economic Education (NCEE) about 45 years ago and has been widely used as an assessment instrument and, more importantly, as a means of comparing individual class performance to a national sample of students and instructors.

[4] This 25-question comprehensive final examination was developed and is regularly utilized as a common final in all principles of macroeconomics in the Department of Economics at the Indiana University-Purdue University at Indianapolis (IUPUI).

An ordinary least square model is defined as:

$$y_i = \beta' x_i + \varepsilon_i \text{ where } \varepsilon_i = (0, \sigma^2)$$

Where Y is the standardized test score and X are explanatory variables.

5. Results and Discussions:

Table 1 shows the summary statistics of the variables used in the study. The mean, standard deviation, minimum and maximum scores show a good variation in the variables under consideration.

Table 1: Summary Statistics for Variables Used in the Study.

	Aplia	*Gender*	*ECH*	*GPA*	*HS GPA*	*Final*
Mean	367	1	44	3	3	13
Standard Deviation	214	0	23	1	1	4
Minimum	1	1	4	0	1	0
Maximum	880	2	109	4	4	24

The Ordinary Least Square (OLS) regression results are presented in table 2. The results indicate that online assignments, cumulative GPA and high-school GPA had a significant impact on the final exam performance. However, the unit impact of online assignment is very small. The most important variable that had a greater impact on student performance is the cumulative grade point average.

Table 2: OLS Estimated Coefficients

	Coefficients	*Standard Error*
Intercept	-1.393	1.559
Aplia – Online Assignments	0.002*	0.001
Gender	0.169	0.387
ECH	0.007	0.008
GPA	2.583*	0.378
HS GPA	1.735*	0.383

Asterisk (*) indicates significant of the coefficient at 5% level

References

Lee, W., Courtney, R. H., & Balassi, S. J. (2010). Do Online Homework Tools Improve Student Results in Principles of Microeconomics Courses? *American Economic Review*, 100(2), 283–86.

Siragusa, L. (2005). Identification of effective instructional design principles and learning strategies for students studying in Web-based learning environments in higher education. Unpublished PhD thesis, Curtin University of Technology, Perth.

Siragusa, L., & Dixon, K. C. (2005). Closing the gap between pedagogical theory and online instructional design: a bridge too far? In G. Chiazzese, M. Allegra, A. Chifari & S. Ottaviano (Eds.), Methods and Technologies for Learning. Southampton: WIT Press.

Siragusa, L, Dixon, K.C and Dixon, R (2007), Designing quality e-learning environments in higher education. In ICT: Providing choices for learners and learning. Proceedings ascilite Singapore 2007. http://www.ascilite.org.au/conferences/singapore07/procs/siragusa.pdf

Taha, A. T. (2010). E-Learning as a New Technological Application in Higher Education and Research: An Empirical Study and Proposed Model. *The International Academic Research Journal*, 2(II), 14-26.

Weller, M. (2002). Delivering learning on the Net: The why, what & how of online education. London: Kogan Page in Siragusa, L, Dixon, K.C and Dixon, R (2007), Designing quality e-learning environments in higher education. In ICT: Providing choices for learners and learning. Proceedings ascilite Singapore 2007.
http://www.ascilite.org.au/conferences/singapore07/procs/siragusa.pdf