



Impact of E-Learning vs Traditional Learning on Student's Performance and Attitude

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ABSTRACT

Background: Recently, with the proliferation of internet technology, the E-learning has become an essential method and new epitome that is widely used and implemented by educational institutions across the globe. **Objective:** The main objective of the current survey was to study the impact of E-learning on the students' academic performance. **Methodology:** It was a facility-based and quasi-experimental research design that carried out in Najran University College of nursing during the period from January to August 2019. By adopting a purposive sampling technique, 80 under-graduate nursing students (40 experimental group+40 as controls) that aged 21-24 years old had been recruited to participate in the current survey. Final exam results and a self-administered questionnaire were used for collecting data. **Results:** The findings revealed that the mean scores obtained by students in the final exam by the E-learning group (Experimental) are statistically significantly higher than those for the traditional group (controls) ($t=3.45$, $df=37$, $p=0.002$). Additionally, the results showed that the mean of the students' overall satisfaction with the traditional face-to-face lectures in the control group was 6.26, while the mean of the students' overall satisfaction with E-learning in the experimental group was 8.74. The difference between students' attitudes was significant ($p=0.015$) in favor of the experimental group. **Conclusion:** The key findings of the present study show a significant difference in learning outcomes besides positive attitudes between online and traditional learners which can be a viable alternative learning method for higher education. It also contributes to the current literature in the area of online instruction and E-learning.

Keywords: E-learning, Academic performance, Attitudes, Nursing students

INTRODUCTION

Learning is a process of achieving knowledge, skill, and performance. Thus learning is ultimately considered one of the fundamental pillars of society changes [1-3]. Nowadays, technology has obviously made our lives easier. That means internet technology has been considered as an important medium for many aspects of our lives including academic learning. E-learning or online learning has received much attention in recent years globally, with an estimated 5-7 million students now are enrolling in at least one online course each year [4].

The introduction of multimedia technologies and the internet in learning in many universities has been observed as a means of improving accessibility and quality of delivery and learning among the students and teachers. Zamani and Kardan believe that with the widespread use of the internet, knowledge has become more effectively reachable by the mass students, educators and researchers [5]. Many terms had been used to describe learning that delivered online or via the internet, ranging from distance education, computerized electronic learning, online learning, internet learning, and many others. Numerous studies concluded that there were significant differences in learning outcomes between E-learning and traditional learning [6-8]. However, and regardless of which one is beneficial still some people support the idea of traditional learning, while others believe in the E-learning system. To study the impact of

E-learning on academic performance, it will be better to be presented with a brief discussion of E-learning concept. Different terminologies had been used to define E-learning. For instance, it has been defined by Jama, et al., as a type or system of learning which is utilizing electronic technologies to access educational curriculum outside traditional classrooms [9]. Sangra, et al., defined E-learning as “A method of teaching and learning that fully or partially signifies the educational model used, based on the use of electronic media and devices as tools for enhancing availability of training, communication and interaction that helps in accepting novel ways of comprehending and establishing learning” [10]. Simply, E-learning courses are specifically delivered via the internet to somewhere other than the classroom for enhancing or supporting learning. That means E-learning is the use of network technologies to create, foster, deliver and facilitate learning, anytime and anywhere for empowering the individual learner so that the teacher/trainer/tutor is no longer the gatekeeper of knowledge, while the role of teachers is likely viewed as facilitators of knowledge process [11]. Oye, et al., defined E-learning as a unifying term used to describe the fields of online learning, web-based training and technology delivered instructions [12]. Khan pointed that E-learning has been described in various ways as learning that is using a number of different technologies and methods for delivery e.g. Computer-based training (CBT), Internet-based training (IBT), Web-based instruction (WBI), Advanced distributed learning (ADL), Distributed learning (DL) Distance learning or Mobile learning, etc. [13].

According to the Communication and Information Technology Commission (CTIC), Saudi Arabia is one of the countries that grow fast in technology usages including E-learning. Accordingly, Ministry of education in Saudi Arabia established a National Center of E-learning in most of Saudi universities [14]. Based on the data collected regarding the impact of E-learning on academic achievement, there were conflicting findings in the literature which range from positive, negative or even no significant difference in students’ performance between online and live classes respectively. Many researchers believe that technology is a tool that used to remove geographical barriers and to facilitate learning anytime and anywhere without presence of lectures which may foster deeper learning. They argue that E-learning has many advantages that include flexibility of access from different locations, ease of access to other materials from other sources that including non-educational ones [15-17]. Additionally, Oye, et al., and Keshavarz believe that E-learning has a positive impact on academic achievements of students in terms of reduces costs, saving time and increases accessibility of education as well as enhances academic performance [18,19].

On the other hand, and despite these benefits, numerous studies pointed that E-learning has a negative impact on students’ achievements, they argue that students may feel isolated, parents may have concerns about children’s social development, students with language difficulties may experience a disadvantage in a text-heavy online environment. For instance, it has been reported that motivation is a skill that cannot be developed when students are allowed to complete tasks at their own leisure and not to complete tasks under pressure time [20-22].

Jaggars concluded that many students need the flexibility of online coursework in order to balance school with work of family demands, while others struggle in online courses due to relatively low levels of self-directed learning skills [23]. Bennett and Maniar believe that one of the disadvantages of E-learning for both sides (learner and instructor) is that there is no immediate feedback [24]. Additionally, Ross and Schulz argue that a major disadvantage of E-learning is that the students need to have self-discipline [25].

Numerous studies’ authors think that in order to take a real course or a real exam, you need to be physically present in a certain place like a classroom and have a teacher or trainer to guide you at all times. They reported some disadvantages regarding E-learning such as lack of interpersonal skill development, lack of memory and learning development and lack of student motivation. They believe that face-to-face learning provides live interaction with the instructor, beside that face-to-face learning helps students to get organized with their studies [26-29].

Negash, et al., [30] reported that there are six different types of E-learning as follow:

1. E-learning with a physical presence and without E-communication (face-to-face)
2. E-learning without the presence and without E-communication (Self-learning)
3. E-learning without the presence and with E-communication (Asynchronous)
4. E-learning with virtual presence and with E-communication (Synchronous)
5. E-learning with occasional presence and with E-communication (Blended/hybrid-asynchronous)

6. E-learning with presence and with E-communication (Blended/hybrid-synchronous)

Among those mentioned types of E-learning methods, the present study focuses on the third type. i.e. asynchronous learning type of E-learning. In this type the learners use the educational media and take responsibility of learning under direction, supervision, and E-communication with the course coordinator.

Performance Calculation in Najran University

One of the most important elements in the current research is the academic performance of the students. Calculating and measuring students' academic performance is what students have learned all the way throughout the course. In Najran university, the students' achievements measured and accomplished based on the course objectives in terms of assignments, class participation papers and tests which are all traditional methods for assessment in addition to projects' presentation in which students can express their comprehension and mastery of course material that can be recorded either manual or within blackboard. By the end of semester course, each student's total grades were will be converted to A, B, C, D and F scales (A=90-100; B=80-89; C 70-79; D=60-69 and less than 60 considered F which is failure.

Significance of the Study

The present study has great significance. For instance, the study findings provide an overview of the E-learning aspects, attitudes and academic performance in order to provide key information to further research in similar areas. Furthermore, the study provides knowledge and guidelines to policymakers, planners, students, and teachers as well as for researchers.

MATERIALS AND METHODS

Participants and Setting

The study population for this study were the undergraduate male and female nursing students who were enrolling in college of nursing at Najran University- Saudi Arabia in the second academic year (2 semesters) with total number of 126 students, that were studying the course of psychosocial cultural variations of health (222-psych-2).

Study Design

It was a facility-based and quasi-experimental research design that was used to study the impact of E-learning vs traditional learning on the students' academic performance. The study was carried out during the period from January-August 2019.

Sampling Process

A total of 80 students that had been divided equally into two groups of 40 for each, the first group was the experimental group (40 males) who were undergoing E-learning styles and the second group (40 females) as control group who were undergoing face-to-face lectures as traditional learning style. In order to make both groups (sections) as equivalent as possible, the course instructional objectives, contents, assignments and assessments in both sections were the same that designed and implemented by the course coordinator. Both groups have the same chance to communicate with the course coordinator for any inquiries as needed. The selection of the students from each section was depended on the scores obtained by students in a quiz that done for them after completed the first unit in the course (Psychosocial cultural variations of health). The quiz administered by the course coordinator to both groups equally, after correction the quiz the first 40 students who had the highest scores were selected from each group to participate in the survey.

Research Instruments

Two instruments were used for data collection; first was the records of students obtained scores of the final test on the course of psychosocial cultural variations of health beside structured questionnaire. A final theoretical test was designed and implemented by the course coordinator in the form of multiple-choice questions (MCQs exam) which corrected electronically for both sections for determining the students' learning performance. Test administration took 2 hours and the maximum test score was 60 points (marks). The second tool was a self-administered and structured questionnaire that utilized for studying the students' attitudes towards E-learning besides their personal demographic information.

Statistical Analysis

The collected data was entered and analyzed by using SPSS version 21.0 statistical software. The odds ratio (OR) with their confidence level (CI) were calculated. Descriptive statistics of continuous variables were expressed as Mean ± Standard Deviation (± SD), $p \leq 0.05$ was considered as statistically significant.

Ethical Consideration and Confidentiality

Prior to the study, informed verbal consent was obtained from each individual student. In regard to confidentiality, the participants were informed that the obtained information will not be made available for anyone who is not involved in the study and it will remain confidential for the purposes that intended for.

RESULTS

Total of 80 participants were included in the current study. Ages of these participants were ranging from 21 to 24 years old (M=20.48 and SD=0.67) (Tables 1-3).

Table 1 Summary of independent t-test on difference of pre-test means on the students' achievement (n=40+40)

Test	Group	M	SD	df	t	p-value
Pre-study quiz	Controls (Females)	7	2.3	36	0.189	0.613
	Experimental (Males)	8	1.62			

As shown in Table 1, there is no statistically significant difference between the means of the two groups ($p=0.613$) regarding their pre-test outcome.

Table 2 Mean and SD of the students' attitudes towards E-learning

Statements	M	SD
I think E-learning can enhances my learning experience as well as communication skills	3.4	1.131
I believe that E-learning gives me the opportunity to acquire new knowledge	3.8	1.629
E-learning is not efficient as a traditional learning method	3.2	1.084
E-learning increases the quality of learning because it integrates all forms of media	3.6	1.449
Adopting ICT and E-learning allows for increased student satisfaction	3.5	1.311
I would be interested in studying courses that use E-learning	3.7	1.042
Overall I feel positive towards E-learning	3.7	0.996

As presented in Table 2 generally, students in the experimental group feel positive attitudes towards E-learning.

Table 3 Summary of independent t-test based on difference of post-test means on the students' achievement (n=40+40)

Test	Group	M	SD	df	t	p-value
Post-study final exam	Controls (females)	9	1.51	37	3.45	0.002
	Experimental (Males)	14.25	1.63			

Table 3, depicts findings on the mean scores obtained in the final test by the E-learning group (males) is statistically significantly higher than the traditional group (females) ($t=3.45$, $df=37$, and $p=0.002$). This means the use of electronic education affects the learning outcome of the experimental group.

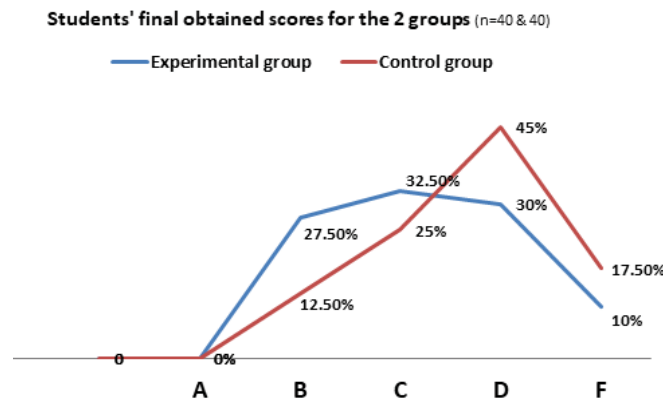


Figure 1 Distribution of students' scores (outcome) for the two groups (n=40+40)

As displayed in Figure 1, the experimental group (males) got higher scores in grade B and C and lee failures.

Table 4 Comparison of attitudes towards using E-learning among the two groups (n=40+40)

Independent Variable	Group	Mean	SD	SD error Mean	t	df	Sig. (2-tailed)	R ²
Perceived of E-learning usage	Experimental	8.74	2.71	0.361	-2.451	141	0.015	0.725
	Control	6.26	2.86	0.324				

Dependent variable: Attitudes towards using E-learning

As appears in Table 4, the results of the questionnaire showed the mean of the students' overall satisfaction with the traditional face- to -face lectures in the control group was 6.26, while the mean of the students' overall satisfaction with E-learning among the experimental group was 8.74. The difference between students' attitudes towards E-learning was significant ($p=0.015$) in favor of the experimental group. Additionally, R^2 was (0.725) which is the coefficient of the regression that indicates a strong relationship between the variables. This concluded result indicated that learners were highly satisfied with E-learning since it enhanced their learning outcomes.

DISCUSSION

The current study was carried out in Najran university-college of nursing to show the impact of E-learning on academic performance in terms of the improved learning process, attitudes towards academic learning and its effects on academic performance. Numerous studies reported that students in higher educational institutions who engaged in E-learning generally performed better than those in face-to-face courses. They believed that E-learning is offering precious opportunities for higher education institutions [31-34].

This concluded fact is inconsistent with our findings, which indicates that E-learning significantly improved academic performance and learning process. Moreover, Holley found that students who participate in online/ E-learning achieve better grades than those who studied the traditional approach [35]. Additionally, these results match those of previous studies by Keshavarz, et al., Ishmirekha, Klein, and Ware who concluded that E-learning has a positive impact on the academic achievements of the students [19,36,37]. Moreover, Zarei-Zavaraki and Rezael in their study done at Khaje Nasir University-E-learning center, reported that the use of E-portfolio has significantly improved students' attitudes, motivation and academic achievements [38].

In regard to attitude towards E-learning among the experimental group in this study, it shows a significant positive influence. Similarly, this finding is compatible with the study performed by Ahmed who concluded that Saudi students have a high positive attitude towards E-learning [39]. On the other hand, Brotherton and Abowd found no statistically significant differences in the grades obtained by the online versus face-to-face groups of students [40].

CONCLUSION

It is important to note that this is an interesting, but perhaps not surprising observation, which suggests that the generation of students in their study may be still are traditional learners and have not yet resorted to such learning.

Limitations

Several limitations of the present study have to be addressed. Firstly, the short duration of the intervention embedded within one single course. In addition, students at nursing colleges were using an E-learning environment for the first time in their academic careers. This could have biased the present findings by an interaction with a lack of experience, varying student expectations, etc.

DECLARATIONS

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Conflicts of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication for this article.

REFERENCES

- [1] Banihashem, Seyyed Kazem, et al. "The effect of E-learning on students creativity." *Scientific Information Database*, Vol. 5, No. 4, 2015, pp. 53-61.
- [2] Liaw, Shu-Sheng. "Investigating students' perceived satisfaction, behavioral intention, and effectiveness of e-learning: A case study of the blackboard system." *Computers and Education*, Vol. 51, No. 2, 2008, pp. 864-73.
- [3] Wang, Yi-Shun. "Assessment of learner satisfaction with asynchronous electronic learning systems." *Information and Management*, Vol. 41, No. 1, 2003, pp. 75-86.
- [4] Allen, I. Elaine, and Jeff Seaman. *Grade Level: Tracking Online Education in the United States*. Babson Survey Research Group. Babson College, 231 Forest Street, Babson Park, MA, 2015.
- [5] Zameni, F., and Kardan, S. "Impact of using ICT on learning mathematics." *Iranian Journal of Information and Communication Technology in Education Sciences*, Vol. 1, No.1, 2011, pp. 23-38.
- [6] Mason, Robin, and Martin Weller. "Factors affecting students' satisfaction on a web course." *Australasian Journal of Educational Technology*, Vol. 16, No. 2, 2000, pp. 173-200.
- [7] Gholamhosseini, L. "E-learning and its place in the higher education system." *Paramedical Medicine Magazine of IRI Army Force*, Vol. 2, No. 2, 2008, pp. 28-35.
- [8] Ellis, Robert A., Paul Ginns, and Leanne Piggott. "E-learning in higher education: Some key aspects and their relationship to approaches to study." *Higher Education Research and Development*, Vol. 28, No. 3, 2009, pp. 303-18.
- [9] Jama, Mpho P., Mabokang LE Mapesela, and Adriana A. Beylefeld. "Theoretical perspectives on factors affecting the academic performance of students." *South African Journal of Higher Education*, Vol. 22, No. 5, 2008, pp. 992-1005.
- [10] Sangra, Albert, Dimitrios Vlachopoulos, and Nati Cabrera. "Building an inclusive definition of e-learning: An approach to the conceptual framework." *The International Review of Research in Open and Distributed Learning*, Vol. 13, No. 2, 2012, pp. 145-59.
- [11] Oye, N. D., Mazleena Salleh, and N. A. Iahad. "Holistic E-learning in Nigerian higher education institutions." *Journal of Computing*, Vol. 2, No. 11, 2010, pp. 20-26.
- [12] Oye, N. D., Mazleena Salleh, and N. A. Iahad. "Challenges of e-learning in Nigerian university education based on the experience of developed countries." *International Journal of Managing Information Technology*, Vol. 3, No. 2, 2011, pp. 39-48.
- [13] Khan, Badrul Huda, ed. *Managing e-learning: Design, Delivery, Implementation, and Evaluation*. IGI Global, 2005.
- [14] ICITC. Coommunication and Information Technology Commission, 2010.
- [15] Ho, Chun-Ling, and Ren-Jye Dzensg. "Construction safety training via e-Learning: Learning effectiveness and user satisfaction." *Computers and Education*, Vol. 55, No. 2, 2010, pp. 858-67.
- [16] Sharpe, Rhona, Benfield Greg, and Francis Richard. "Implementing a university E-learning strategy: Levers for change within academic schools." *Research in Learning Technology*, Vol. 14, No. 2, 2006, pp. 135-51.
- [17] Draper, Stephen W., and Margaret I. Brown. "Increasing interactivity in lectures using an electronic voting system." *Journal of Computer Assisted Learning*, Vol. 20, No. 2, 2004, pp. 81-94.
- [18] Oye N. A., et al. "The impact of e-learning on students' performance in tertiary institutions." *International Journal of Computer Networks and Wireless Communications*, Vol. 2, No. 2, 2012, pp. 121-30.
- [19] Maleki, Shahab, and Zohre Sanisales. "The impact of E-learning on creativity and learning in physiology course in nursing students of Shahrekord University of Medical Sciences." *Future of Medical Education Journal*, Vol. 5, No. 4, 2015, pp. 25-29.
- [20] Ruiz, Jorge G., Michael J. Mintzer, and Rosanne M. Leipzig. "The impact of e-learning in medical education." *Academic Medicine*, Vol. 81, No. 3, 2006, pp. 207-12.

- [21] Bernard, Robert M., et al. "How does distance education compare with classroom instruction? A meta-analysis of the empirical literature." *Review of Educational Research*, Vol. 74, No. 3, 2004, pp. 379-439.
- [22] Jahng, Namsook, Don Krug, and Zuo Chen Zhang. "Student achievement in online distance education compared to face-to-face education." *European Journal of Open, Distance and E-Learning*, Vol. 10, No. 1, 2007, pp. 1-12.
- [23] Jaggars, Shanna Smith. "Choosing between online and face-to-face courses: Community college student voices." *American Journal of Distance Education*, Vol. 28, No. 1, 2014, pp. 27-38.
- [24] Bennett, E., and N. Maniar. "Are videoed lectures an effective teaching tool." ResearchGate, 2007.
- [25] Ross, Jonathan, and Robert Schulz. "Can computer-aided instruction accommodate all learners equally?." *British Journal of Educational Technology*, Vol. 30, No.1, 1999, pp. 5-24.
- [26] Cantoni, Virginio, Massimo Cellario, and Marco Porta. "Perspectives and challenges in e-learning: towards natural interaction paradigms." *Journal of Visual Languages and Computing*, Vol. 15, No. 5, 2004, pp. 333-45.
- [27] Al-Alawneh, Muhammad K. "Examining E-learning barriers as perceived by faculty members of engineering colleges in the Jordanian universities." *Turkish Online Journal of Distance Education*, Vol. 15, No. 1, 2014, pp. 22-40.
- [28] Berge, Zane L., Lin Y. Muilenburg, and J. V. Haneghan. "Barriers to distance education and training: Survey results." *The Quarterly Review of Distance Education*, Vol. 3, No. 4, 2002, pp. 409-18.
- [29] Fann, Nancy J., and Stephen D. Lewis. "Is online education the solution?." *Business Education Forum*, Vol. 55, No. 4, 2001.
- [30] Negash, Solomon, ed. *Handbook of distance learning for real-time and asynchronous information technology education*. IGI Global, 2008.
- [31] Arkorful, Valentina, and Nelly Abaidoo. "The role of e-learning, advantages and disadvantages of its adoption in higher education." *International Journal of Instructional Technology and Distance Learning*, Vol. 12, No. 1, 2015, pp. 29-42.
- [32] Al-Adwan, Ahmad, and Jo Smedley. "Implementing e-learning in the Jordanian higher education system: Factors affecting impact." *International Journal of Education and Development Using Information and Communication Technology*, Vol. 8, No. 1, 2012.
- [33] Alias, Nor Aziah, and Ahmad Marzuki Zainuddin. "Innovation for better teaching and learning: Adopting the learning management system." *Malaysian Online Journal of Instructional Technology*, Vol. 2, No. 2, 2005, pp. 27-40.
- [34] Borstorff, Patricia C, and S Keith Lowe. "Student perceptions and opinions toward e-learning in the college environment." *Academy of Educational Leadership Journal*, Vol. 11, No. 2, 2007, pp. 13-128.
- [35] Holley, Debbie. "Which room is the virtual seminar in please?" *Education+Training*, Vol. 44, No. 3, 2002, pp. 112-21.
- [36] Ishmirekha, Handique. "A study on attitude of college students towards e-learning with special Reference to North Lakhimpur of Lakhimpur District, Assam." *International Journal of Information Science and Education*, Vol. 4, No. 1, 2017, pp. 1-9.
- [37] Klein, Donald, and Mark Ware. "E-learning: New opportunities in continuing professional development." *Learned Publishing*, Vol. 16, No. 1, 2003, pp. 34-46.
- [38] Zarei Zavaraki, E., and I. Rezaei. "The impact of using an electronic portfolio on attitude, motivation, and educational progress of students of Khaje Nasir Toosi University of Technology." *Educational Measurement*, Vol. 2, No. 5, 2011, pp. 67-96.
- [39] Bendania, Ahmed. "Instructors' and learners' attitudes toward teaching and learning online: King Fahd university of petroleum and minerals (KFUPM) (Saudi Arabia) case study." *International Journal of Arts and Sciences*, Vol. 4, No. 8, 2011, p. 223.
- [40] Nicholas, Mark. "A theory for E-learning." *Educational Technology and Society*, Vol. 6, No. 2, 2013, pp. 1-10.