Case study: Applying Online Courses at King Khalid University in Saudi Arabia

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ABSTRACT

The integration of online teaching into higher education in Saudi Arabia occurred relatively late and is still dealing with difficulties in terms of instructional delivery, quality, and most importantly students’ learning outcomes. This study focuses on students’ performance when using both traditional and online learning methods based on data collected from a course taught by one of the faculty members in the Computer Science College at King Khalid University. In the course, called Computer Ethics, students were divided into two sections: (1) a face-to-face section, with 43 students; and (2) a fully online section, with 28 students. An independent sample t test was used to compare the means of students’ final grades from both sections. We assumed that both sections’ means would be equal; however, the results of the independent sample t test revealed that this was not the case. Therefore, we rejected the null hypotheses and accepted the alternative.

Keywords: Online learning, higher education

1. INTRODUCTION

In recent decades, the Kingdom of Saudi Arabia has grown rapidly in higher education and e-learning as well as other development areas. In particular, during the last decade, the number of public universities has increased from seven to twenty-three universities scattered throughout the kingdom; the number of enrolled students has also significantly increased [1]. As indicated on the website for the Department of Planning and Information Affairs, a total of 1,142,132 students were enrolled in 2013, which is a remarkably large enrollment number compared to previous years. Based on the significant improvements made, the Ministry of Higher Education became more interested in integrating new technology, such as online learning, to open new avenues of delivering instruction and making learning accessible as well as, most importantly, improving students’ learning outcomes [3].

In 2006, the Ministry of Higher Education established the National E-learning and Distance Learning Center, which is responsible for developing e-learning across public universities in Saudi Arabia. The center focuses on the following elements: (1) implementing quality standards for e-learning; (2) helping universities increase service capacity through electronic applications; (3) helping society develop an e-learning culture; and (4) funding research in e-learning [4]. However, the major challenge that concerns both the e-learning center and its faculty members is students’ adoption of online learning and the transformation process from traditional teaching to online teaching, including understanding the effects of online learning on students’ performance and learning outcomes [5].

With the new demands of the Ministry of Higher Education in encouraging faculty members to integrate technology into their classrooms, such as online learning, the Computer Science College at King Khalid University has taken the initiative to offer the course Computer Ethics. Usually the course is offered face-to-face for freshmen computer science majors. In summer 2012, the Computer Science College offered two sections of the course: an on campus section and a fully online course section. Twenty-eight students enrolled in the face-to-face section, compared to 43 in the online section.

In this study, we measure students’ performance in the online course section and compare the final grade means for both sections using an independent sample t test to determine whether the online teaching method affects students’ performance.

2. LITERATURE REVIEW

Without a doubt, e-learning has brought many great opportunities into the education system. However, students’ perceptions toward e-learning have relied heavily on the perceived advantages and disadvantages [8]. The major advantages of e-learning include schedule flexibility and accessibility, the provision of access to instructions regardless of the location and time zone, and a convenience as a learning method for those who work full time and want to pursue a college degree [9]. Along with the previous advantages, e-learning emphasizes self-directed learning, motivating students to take responsibility for their own learning.

Although e-learning offers remarkable improvements in education, several of its limitations might affect the development of e-learning. The major barrier of e-learning is the technical aspect in terms of the availability of certain equipment for both institutions and students (Farooq & Javid, 2012). Other limitations include (1) limited access to Internet resources, (2) teachers’ lack of training about using technology, (3) the high cost of equipment, and (4) misunderstandings about the e-learning culture.

Farooq and Javid [6] conducted a case study on students’ attitudes toward incorporating e-learning in English courses at Taif University in Saudi Arabia. The authors used a questionnaire to investigate three factors:
access, use, and attitudes toward online learning. The population in the study was 100 undergraduate students majoring in information technology and engineering, who were required to take between 12 and 15 English courses. The study’s findings were quite interesting. Most of the students (95%) had full access to computers and an Internet connection either at home or school, but they were not motivated to participate in online learning. The researchers mentioned that the reasons behind such resistance included a misunderstanding of the e-learning culture, the lack of technology use by faculty members, and a lack of training.

Alebaikan [5] conducted extensive research on perceptions of blended learning in Saudi Arabian universities. Blended learning can be defined as a teaching method in which students learn part of the instructions via online delivery. The main objective of the study was to identify the key factors that influence female Saudi Arabian undergraduate students and faculty members to incorporate blended learning. The qualitative method used in the study gathered data from 68 students to explore their perspectives of blended learning. The study findings showed that 89% of the students reported that blended learning assisted them in increasing their academic performance and level of engagement; however, 11% showed no interest in using online learning because they lacked computer skills.

Asiri [8] examined the attitudes of undergraduate students toward e-learning at King Khalid University in Saudi Arabia. Both quantitative and qualitative methods were utilized to collect data from undergraduate students enrolled in the online section of Arabic language classes. A total of 200 male undergraduate students were recruited for the study. The main question of the study aimed to identify the attitudes of undergraduate students toward e-learning in Arabic language courses. The author applied statistical methods using a Pearson correlation coefficient, means, standard deviations, a t test, and a regression analysis to analyze the data. Based on the analyzed data, the findings indicated that students have positive attitudes toward e-learning because they reported that e-learning provides more accessibility and flexibility than traditional classes. The results showed a positive high correlation between prior computer experiences and students’ attitudes toward online learning. On the other hand, students with less or no previous computer experience were less positive toward e-learning. Consequently, the prior experience with computer usage was the key factor affecting students’ attitude toward e-learning in the study.

3. METHODOLOGY
The current study measures students’ performance in online courses by comparing the means of final grades for students from the online section with those in the face-to-face section. In total, 71 students participated, divided into two sections: 43 students in the online section and 28 students in the face-to-face section. An independent sample t test was used to compare the two groups’ means. One independent variable, final grades, as tested for both groups.

4. HYPOTHESES
Null hypothesis: The average final grades between students in the online section and those in the face-to-face section are equal. Alternative hypothesis: The average final grades between students in the online section and those in the face-to-face section are not equal. Mathematically, let \( \mu_1 \) and \( \mu_2 \) be the average final grades among students in the online and face-to-face sections, respectively. Then, \( H_0: \mu_1 = \mu_2 \) and \( H_1: \mu_1 \neq \mu_2 \). The hypothesis was tested at the 5% level of significance (i.e., \( \alpha = 0.05 \)).

5. EXPLORATORY ANALYSIS
Before applying the independent sample t test to the dataset, skewness, kurtosis, and distribution normality needed to be verified.

The final grades were more spread out, as indicated by the respective standard deviations in the online section compared to the face-to-face section (see Figure 1). The descriptive statistics of the final grade by section are shown in Figure 2. The mean final grade for the face-to-face section (84.1) was higher than that for online section (62.9); the standard deviations were 6.28 and 21.0, respectively.

Fig 1: distribution box plot
The Final grades were moderately negatively skewed in both sections, as shown in Figure 2; the skewness was -0.89 and -0.59 in the online and the face-to-face sections, respectively. No evidence suggested that excess kurtosis occurred in either the online group test statistic (0.723/0.709=1.02), or the face-to-face group (0.28/.828=0.34) at the 5% significance level, corresponding to a critical value of 2.0.

The normality test revealed that the distribution is normally distributed in both the Kolmogorov-Smirnov and Shapiro-Wilk tests because the significant value is greater than the significant level at α=0.05, as shown in Figure 3. So now we can confidently assume that the data are normally distributed. Therefore, we can confidently apply the independent t sample to the data.

The mean final grade for the online section was 21.2 higher than the mean in the face-to-face section, as shown in Figure 4. This means that there is a 95% probability that the interval 14.3–28.0 covers the true difference between the online and face-to-face sections. The difference between the means, on a t test (two-tailed test) that does not assume equal variances in the two groups, was statistically significant at the 5% level (p-value<0.001). We therefore rejected the null hypothesis that the means of the final grades in the two sections are equal.

As we achieved statistical significance, we wanted to calculate the effect size to examine the distance between the standard deviations for both sections. According to Cohen’s effect size test (-1.25), there was a very noticeable difference between both means, which is about a 1.25 SD difference.

The power value in this case is equal to (1), which is greater than 0.8; thus, the type II error was controlled. As we rejected H0 and accepted H1, we have a 100% probability of achieving statistically significant results.

7. DISCUSSION

Based on the findings, students’ performance in the online section was noticeably lower compared to those in the face-to-face section. In the face-to-face section, students’ final grades fell between approximately 36 and 94, whereas the online section final grades ranged between 3 and 97, as shown in Figure 7. This indicates that some students in the online section might not have had prior experiences in online learning or computer skills. According to past research on e-learning integration in Saudi Arabia, computer skills and prior experience play more significant roles in students’ performance in online courses compared to other students with computer skills [5 & 8]

8. CONCLUSION

In conclusion, online learning is still considered a new aspect in the higher education system in Saudi Arabia. Several important factors need to be addressed before applying online learning in Saudi Arabian universities, including students’ acceptance of e-learning. It is very important to look at students’ acceptance in terms of the e-learning culture, a new way of learning, understanding of self-directed learning, and computer skills in order to reduce their uncertainty and increase their chance of understanding the e-learning environment.

REFERENCES


AUTHOR PROFILES

Adel Qahmash is working at King Khalid University Saudi Arabia as lecturer and taught several courses such as designing interactive courses, integration technology into education and so on. Recently Mr. Qahmash is doctoral student majoring in instructional technology at Northern Illinois University, hold master degree in Instructional Technology from Bloomsburg University and bachelor degree in Educational Computing from King Khalid University.