Learning self-efficacy and barriers among students to online learning during the COVID-19 pandemic

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A B S T R A C T

The purpose of this study is to determine contributory factors to students' self-efficacy and barriers in online learning during the COVID-19 pandemic. This research used a quantitative-cross sectional with the 202 student nurses of the College of Nursing, University of Hail. These students were chosen through convenience sampling. Data gathering was between November and December 2021. The frequency and percentage were used to analyze the demographic characteristics and the identified barriers. The results show a significant difference between gender and online environment ($t=-3.807$; $p<.001$), time management ($t=-2.651$; $p<.009$), and technology ($t=-2.902$; $p<.004$) was established. The age was not significant difference with online environment ($F=.103$; $p>.902$), time management ($F=1.408$; $p>.247$), and technology ($F=.750$; $p>.474$). In addition, the level of proficiency was found no significant difference in the online environment ($F=1.986$; $p>.098$), time management ($F=1.026$; $p>.395$), and technology ($F=2.231$; $p>.067$). Lastly, the grade point average (GPA) was also found no significant difference with the online environment ($F=.923$; $p>.490$), time management ($F=.743$; $p>.636$), and technology ($F=.449$; $p>.870$). The weak internet connection has the highest percentage (43.6%) followed by poor presentation materials of instructors (34.2%) as the identified barriers to self-efficacy in online learning education. In conclusion, educational institutions need to understand the factors that influence student attraction and motivation to continue taking online studies in the future.

1. Introduction

The COVID-19 pandemic has caused educational institutions forcing to adapt quickly to distant and online learning (Almaiah et al., 2020) to keep academic activities working. Such a circumstance leads educational institutions worldwide to pursue innovative techniques promptly (Dhawan, 2020) so that students can still engage in learning. Online learning has been described as learning that takes place entirely on the web and takes place outside of the classroom (Oblinger and Oblinger, 2005) that uses digital sites to meet the learning needs of students (Hannum et al., 2008). While it is known to increase innovation involving digital inputs, online learning can lead students to overlook subtleties of expressions (e.g., facial, body gestures) and movement restrictions which learning styles can be compromised. Therefore, educational institutions must realize the aspects of online education that may contribute to students' learning self-efficacy.

Online learning has been classified as synchronous and asynchronous, where the former allows for accurate time contact between the instructor and the students. In contrast, considerable time delays between instruction and its recipients (Finkelstein, 2006). In this study, online learning refers to synchronous and asynchronous. While it has long been recognized that online teaching-learning is an effective tool for learning (Aronoff et al., 2010), students may find online learning problems due to the lack of nonverbal communication (Khalil et al., 2020), which may factor into student's self-efficacy. According to Bandura (2016), self-efficacy can be described as a person's confidence in his or her capacity to succeed in a given scenario or complete a given activity. In online learning, self-efficacy can be perceived as a significant psychological aspect (Yavuzalp and Bahcivan, 2020). Indeed, earlier studies demonstrate that online self-efficacy has been linked to school

performance. For example, Zimmerman and Kulikowich (2016) posited that higher online learning self-efficacy is more likely to succeed in online courses. Further, self-efficacy is essential in online learning performance (Hodges, 2008) and learning achievement (Shen et al., 2013). Nevertheless, only a few studies in online learning environments focus on general self-efficacies and the learning component (Alqurashi, 2016).

The rapid shifting of the traditional classroom to online learning has made educational institutions unaware of the proper access controls and students in operational settings. Such a circumstance served as barriers to distance education, which have occurred and continue to exist. For example, the most significant barriers to the adoption of online learning are the lack of competence in information technology, a lack of network infrastructure, a lack of content development (Aung and Khaing, 2015), and the lack of employees to manage distance learning (Irvin et al., 2010). Moreover, communicating via e-mail cannot receive timely assistance or responses (Ouma et al., 2013) has been found an impediment to online learning.

This study can be an essential input in deciding on the learning environment in the online platform to promote effective learning. Indeed, despite barriers, online education can provide various benefits for student nurses by allowing them to practice rare and critical occurrences in controlled settings. However, to carry this out, educational institutions must be better equipped. They may need to start using online learning and blend it with traditional classrooms so learning can be more realized. Therefore, this study aims to determine contributory factors to students' self-efficacy and barriers in online learning during the COVID-19 pandemic.

2. Methods

2.1. Research design

This research used a quantitative-cross sectional approach to determine the contributory factors to students' self-efficacy and barriers in online learning during the COVID-19 pandemic.

2.2. Participants/setting

The participants were the 202 student nurses of the College of Nursing, University of Hail. These students were chosen through convenience sampling, excluding the following:

1. Those who have not consented to participate.
2. Those who cannot understand English.

2.3. Data gathering procedure

After clearance from the Institutional Review Board (IRB) of the University of Hail, the researcher invited the students to attend the orientation with a zoom link, which was provided to them by their instructor, two weeks before the actual data gathering. During the orientation, the researcher explained the purpose of the study, the rights of the participants, and that they can withdraw anytime if they feel pressure at any time. The data gathering was between November and December 2021 during the students' break time.

2.4. Instrument

This research adopted the online learning self-efficacy (OLSE) questionnaire developed by Zimmerman and Kulikowich (2016). The OLSE questionnaire has 22 items and three subscales representing online learning with ten items, time management with five items, and technology use with seven items. OLSE questionnaire is measured with six Likert scales from strongly disagree (1) to agree to strongly agree (6). The higher the score, the higher the self-efficacy. The reliability test in this study revealed a Cronbach's alphas of 0.87 for online learning, 0.86 for time management, and 0.87 for technology use.

2.5. Data analysis

The data gathered were treated using SPSS version 26. The frequency and percentage were used to analyze the demographic characteristics of the participants as well as the identified barriers. In addition, a one-way Analysis of Variance (ANOVA) was used to treat age, level of proficiency, and grade point average. Meanwhile, the t-test was used to treat gender.

3. Results

Table 1 presents the demographic characteristics of the participants. Of the 202 student nurses who participated, 64.3% belonged to 21-25 years old, with 53.5% of them being males. In addition, the participants were using both non-English and English equally (49%).

Table 2 presents the differences between the demographic characteristics and level of self-efficacy in online learning. Gender was found to have significant difference with online environment (t=-3.807; p<.001), time management (t=-2.651; p<.009), and technology (t=-2.902; p<.004). Concerning the age of the participants, it was found that there was no significant difference between the online environment (F=.103; p>.902), time management (F=1.408; p>.247), and technology (F=.750; p>.474). On the level of proficiency, it was found that there is no significant difference in the online environment (F=1.986; p>.098), time management (F=1.026; p>.395), and technology (F=2.231; p>.067). Lastly, the grade point average (GPA) was also found no significant difference with the online environment (F=.923; p>.490), time

management (F=.743; p>.636), and technology (F.449; p>.870).

Table 3 presents the top 6 identified barriers to online education that may factor into the learning efficacy of the student nurses. Accordingly, the weak internet connection has the highest percentage (43.6%), followed by poor presentation materials of instructors (34.2%). Also, students identified 'difficulty in comprehension of topics' as the third barrier (29.7%), followed by course materials not available in the Blackboard learning management system (26.7%) as the fourth. The fifth barrier was the 'long topic discussions' (24.7%), and lastly, the limited activities to participate in the class came in as the sixth barrier (21.8%).

4. Discussion

This study aims to determine contributory factors to students' self-efficacy and barriers to online learning during the COVID-19 pandemic. In this present study, gender was found to significantly differ in the online environment, time management, and technology, in which female student nurses scored higher than their male counterparts did. This is because females were more persistent and devoted than males; they were able to obtain better learning results (Richardson and Woodley, 2003). Such a result can be credited to the females' confidence in their abilities and interest in computing-related subjects. Further, it implies that women and men engage in online learning settings in diverse ways. Indeed, with the rise of online courses during this pandemic, higher education academicians must analyze how their students engage and devise strategies to ensure that active learning is successful for everybody.

The age of student nurses has found a significant difference in self-efficacy with online learning, which means that as they age, they understand the usefulness of online education, especially in this pandemic. This result is consistent with Kabir et al. (2022) finding that age has been significantly associated with the use of technology. Therefore, when creating online sessions, nursing education teachers should improve their online course development and examine the key parameters such as age. This indicates that regardless of learner's age, teachers must prepare their students to become proficient in the rapidly evolving field of online learning. Creating efficient educational practices is regarded as critical to online learners' accomplishment and retention.

On the level of English proficiency, it was found that there is no significant difference in the online environment, time management, and technology. This is perhaps that despite English as the second language of student nurses in Saudi Arabia, the teachers can make a strong command of English in navigating the online learning management system. Although, according to language barriers in online learning, aside from challenges with submitting assignments and understanding course content online, some students may face an additional challenge, which is a language barrier. Some students may not be native English speakers and thus face a linguistic barrier. On one note, student nurses' grade point average (GPA) has been found no significant difference with the online environment, time management, and technology. This implies that GPA is not a causal factor in the online self-efficacy of the student. GPA and online self-efficacy have not been explored in the literature. Although, in another context, Butcon et al. (2021) found that GPA was a determining factor in the educational environment while Tiyuri et al. (2018) found that GPA has a significant direct relationship with research self-efficacy score.

Table 1: Demographic characteristics of participants N=202

Demographics	Frequency	Percentage
Age		
20 years old and below	62	30.7
21-25 years old	130	64.3
26 years old and above	10	5
Gender		
Male	108	53.5
Female	94	46.5
Level of English Proficiency		
Only non-English	4	2
More non-English	40	20
Both non-English and English Equally	99	49
More English	57	28
Only English	2	1
Grade Point Average (GPA)		
Exceptional	13	6.4
Excellent	56	28
Superior	17	8.4
Very good	63	31.2
Average	33	16.3
Good	15	7.42
High Pass	3	1.5
Pass	2	1

Table 2: Differences between demographic characteristics and Learning self-efficacy

Learning Self-Efficacy	Demographic characteristics	Mean	t-Value	df	Sig. (2-tailed)
	Gender				
Online Environment	Male	3.17	-3.807	200	.001
	Female	3.79			
Time Management	Male	3.43	-2.651	200	.009
	Female	3.90			
Technology	Male	3.31	-2.902	200	.004
	Female	3.85			
	Age	**Mean**	**F-value**	**df**	**Sig.**
Online Environment	20 years old and below	3.44	.103	2,199	.902
	21-25 years old	3.48			
	26 years old and above	3.32			
Time Management	20 years old and below	3.58	1.408	2,199	.247
	21-25 years old	3.73			
	26 years old and above	3.06			
Technology	20 years old and below	3.75	.750	2,199	.474
	21-25 years old	3.62			
	26 years old and above	3.25			
	Level of English Proficiency				
Online Environment	Only non-English	2.37	1.986	4,197	.098
	More non-English	3.15			
	Both non-English and English Equally	3.52			
	More English	3.65			
	Only English	3.60			
Time Management	Only non-English	3.05	1.026	4,197	.395
	More non-English	3.34			
	Both non-English and English Equally	3.71			
	More English	3.78			
	Only English	3.90			
Technology	Only non-English	2.67	2.231	4,197	.067
	More non-English	3.35			
	Both non-English and English Equally	3.61			
	More English	3.95			
	Only English	4.00			
	Grade Point Average				
Online Environment	Exceptional	3.26	.923	8	.490
	Excellent	3.34			
	Superior	3.65			
	Very good	3.61			
	Average	3.54			
	Good	2.96			
	High Pass	3.83			
	Pass	4.30			
Time Management	Exceptional	3.46	.743		.636
	Excellent	3.81			
	Superior	3.70			
	Very good	3.72			
	Average	3.47			
	Good	3.10			
	High Pass	3.90			
	Pass	4.30			
Technology	Exceptional	3.36	.449		.870
	Excellent	3.73			
	Superior	3.73			
	Very good	3.71			
	Average	3.48			
	Good	3.41			
	High Pass	4.00			
	Pass	4.35			

Table 3: Identified barriers to learning self-efficacy in online learning

Identified Barriers	Frequency	Percentage
1. Weak internet connection	88	43.6
2. Poor presentation materials of instructors	69	34.2
3. Difficulty in comprehension of topics	60	29.7
4. Course materials not available in the Blackboard learning management system	54	26.7
5. Long topic discussions	50	24.7
6. Limited activities to participate in class	44	21.8

The findings of this cross-sectional study are similar to previous studies that have shown the impact of a higher frequency of individuals not finding online learning practical or valuable. For example, the student nurses in this study reported that weak internet connection, which is similar to the finding of Maheshwari (2021). In addition, Xu and Jaggars (2013) mentioned that one of the problems in online education is the creation of compelling online materials, which is consistent with the poor presentation materials in online education. Moreover, student nurses identified difficulty in comprehension of topics, course materials not available on the blackboard, long topic discussion,

and limited activities to participate in class are barriers to online self-efficacy. Therefore, educational institutions must comprehend the essential aspects of attracting students and motivating them to continue attending online classes.

Every study has its limitation. In this study, limitations include the study's setting in one single university. Moreover, other factors were not considered in this study, such as the students' abilities in navigating the learning management system, the location of the student during the online learning, and the number of hours of online classes. This can be expounded by including these factors in future interrogation and expanding the research to other universities.

5. Conclusion

Female students scored higher on online self-efficacy than males, which made a significant difference. The age, level of proficiency, and grade point average (GPA) were no significant differences with the online environment, time management, and technology. The weak internet connection has the highest percentage followed by poor presentation materials of instructors as the identified barriers to self-efficacy in online learning education. Therefore, educational institutions need to understand the factors that influence student attraction and motivation to continue taking online studies in the future.

Compliance with ethical standards

Ethical consideration

This research has the approval of the Institutional Review Board of the University of Hail. Furthermore, anonymity, confidentiality, and the right to withdraw from the study were ensured for the participants.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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