Healthcare Students' Perceptions towards Using e-learning, and Self-reported Drivers and Barriers during COVID-19 Pandemic

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ABSTRACT

Background: COVID-19 pandemic has reignited interest in online education as an appealing alternative. The study's goal was to evaluate students' perception of using e-learning, and to identify drivers and barriers the students experienced to the application of e-learning tools. **Materials and Methods:** This cross-sectional study was conducted between March 2020 and May 2020. The data was obtained using a self-administered questionnaire from the students adopting a census sampling method. The findings of Lean *et al.*, as well as the study's objectives, were used to develop the questionnaire. The data was evaluated for descriptive and inferential analyses using SPSS version 21 (IBM Corporation, Armonk, NY, USA). **Results:** More than one half (52.7%) of the total students (n=228) opined e-learning as a useful method for grasping basic concepts and coming up with new ideas. Pictures, graphs, videos, illustrations, and case studies were among the most beneficial aspects of e-learning (56.1%). The ease of communicating electronically (p=0.045) and smoother interaction between instructor and student (p=0.050) were the major motivators across the colleges. Sluggish internet (p=0.010), misunderstanding about the importance of the study material (p=0.007) and ambiguity about where to begin (p=0.048) were the three significant issues encountered during e-learning across the gender. The most significant disadvantage of having more internet access as a result of online learning was that students spent a significant proportion of their daily time on non-academic activities. **Conclusion:** Electronic learning is a useful and productive educational tool particularly during the COVID-19 pandemic. Images, charts, videos, illustrations and case studies can all help to highlight its beauty.

Key words: COVID-19, E-learning, Healthcare, Perception, Saudi Arabia, Students.

INTRODUCTION

Recent advances in information technology have a profound impact on various aspects of our daily lives, including education.[1] E-learning is a relatively recent technique in higher education that offers an appealing alternative to traditional teaching-learning, particularly for academic institutions with limited resources.[2,3] In order to stay competitive, many higher education institutions have adopted electronic learning as a teaching tool due to convenience, usefulness and acceptance.[4] Following the declaration of the COVID-19 outbreak as a global pandemic by the World Health Organization (WHO), every area, including education, has been severely impacted. Due to the pandemic, the whole world was placed on lockdown, and colleges and schools stayed closed. COVID-19, on the other hand, has reignited a desire to educate online and online platforms could play an important role in organizing, preparing, delivering and monitoring the learning process during this pandemic.[5,6]

E-learning is gaining traction in higher education owing to its simplicity and numerous features, such as a range of teaching methods and course design.[7] Online education enables students to learn at their own speed in order to attain the best possible results.[8,9] E-learning tools, when used correctly, have various benefits for both students and instructors, including accessibility and ease of access to information.[10-14]

Saudi Arabia, a leading country in the Gulf region, is making strides in the area of electronic learning and is one of the leading countries in terms of rapid adoption of technology. In Saudi Arabia, Blackboard, an online course management program, is gaining popularity quickly.[15] It has interactive teaching-learning features, as well as a variety of assessment methods and the ability to monitor students' activities. Saudi Arabia is eager to adopt new technology in the higher education sector in order to improve educational quality by immersive teaching and learning. It has also called for a "public strategy to implement information technology across the country" to support this.

Due to the COVID-19 pandemic, there was a global push to transition to online learning; thus a number of studies on electronic learning were done, mostly focusing on the need of online learning and learning process.[16-22] Few studies, on the other hand, provided insight into university students' perceptions of adopting e-learning and the hurdles they faced during the pandemic's early stages, when the entire world was split on how to handle the problem. Hence, this study was devised with the objectives to evaluate students' perception of using e-learning, and to identify drivers and barriers the students experienced to the application of e-learning tools.

MATERIALS AND METHODS

Study design

This was a cross-sectional institution based prospective study. The study was carried out in accordance with the ethical principles set out by the institutional research committee. This research was endorsed by the Research Ethics Committee at the University of Hail, Saudi Arabia with research project No: H-2020-055.

Study duration and location

The study was conducted between March 2020 and May 2020 at various health related colleges of the University of Hail, Saudi Arabia.

Sample size and sampling procedure

The population of this study was University students, and we choose to sample the entire population, hence the sample size in this study is the complete population. However, all of the students did not take part in the survey. A total of 228 students completed the survey and the participants were sampled from the study population using a census sampling method.

Study tool

A self-designed survey questionnaire was used in this analysis. The study's objectives guided the creation of the questionnaire. Faculty from the University of Hail's College of Pharmacy assessed the tool's face and content validity. Test-retest was used to determine the questionnaire's reliability. The questionnaire was piloted with a small group of randomly selected participants, and necessary changes were made based on their responses. The findings of Lean *et al.*[23] as well as the study's objectives, were used to develop the questionnaire, and is consisted of four parts (A-demographic characteristics, B-opinion or view about e-learning, C-reasons for preferring e-learning, and D-barriers to e-learning). Participation in the study was entirely voluntary.

Data collection and analysis

Level four, six, eight, and 10 students enrolled in different health related undergraduate programs (session 2019-2020) were approached and the self-administered questionnaire was distributed to them by the data collectors. The data was entered in version 21 of SPSS (IBM Corporation, Armonk, NY, USA) and analyzed using required statistical methods for descriptive and inferential analyses. The Chi-square test was used to determine differences in categorical results.

RESULTS

Males made up 55.3 percent of the 228 participants. More than two-thirds of the respondents were from pharmacy and dental schools (Table 1). Students perceived e-learning as a helpful way to grasp basic concepts and come up with new ideas. Images, graphs, videos, illustrations, and case

studies were among the most beneficial aspects of e-learning. However, the students at the University of Hail believed that a combination of online and traditional learning would be optimal. Students from various colleges showed significant associations with their preferred method of lecture delivery (*p*=0.007), the type of presentation that students gain the most from (*p*=0.017), and the time consumed on the internet for learning activities on a daily basis (*p*<0.001) (Table 2).

The convenience of electronic communication and the ease of interaction between the instructors and the students were two of the most motivating aspects of e-learning in college. There was a significant association between the ease of interacting online and the students of various colleges (*p*=0.045) (Table 3).

Slow internet, apprehension about the content's meaning, and a lack of direction were the most common issues encountered by both genders during e-learning. Gender and uncertainty about the importance of content (*p*=0.007) and uncertainty about where to begin (*p*=0.048) had significant associations (Table 4).

Students accessed the internet for a considerable portion of their daily time for non-academic purposes (Figure 1).

DISCUSSION

Despite the fact that online classes became popular during the COVID-19 pandemic, students preferred face-to-face lectures because

Table 1: Participants' Demographic Profile (*n*=228).

Variables		Number	Percentage
Gender	Male	126	55.3
	Female	102	44.7
Age	19 to 22 years	135	59.2
	23 to 26 years	93	40.8
College	Pharmacy	75	32.9
	Medicine	24	10.5
	Dental	82	36.0
	Nursing	39	17.1
	Public Health	8	3.5
Study level	Level two	21	9.2
	Level four	40	17.5
	Level six	59	25.9
	Level eight	41	18.0
	Level ten	67	29.4

Table 2: Students' Viewpoint on Learning Approaches across Colleges.

Variables		n (%)	P value
The most favored mode of delivery of lectures	Face to face lecture	127 (55.7)	0.007*
	Online live and recorded session	90 (39.5)	
Type of presentation students learn the most from	Online interactive and recorded lecture in Blackboard	116 (50.9)	0.017*
	Face to face lecture	112 (49.1)	
The most preferred available means for asking questions with instructors	Meeting the teacher of the course during office hours	91 (39.9)	0.002*
	Conveying the issue through class representative	57 (25)	
	E-mailing the course teacher	41 (18)	
	Asking questions via an anonymous Blackboard discussion board	39 (17.1)	
E-learning as helpful tool in	Getting the fundamental concept	103 (45.2)	0.062
	Getting focal idea and exposure to practical applications	67 (29.4)	
	Innovation	17 (7.5)	
The most useful part of the e-learning	Images, charts and videos	128 (56.1)	0.064
	Examples and case studies	51 (22.4)	
	Contents	49 (21.5)	
Time spent on internet daily for academic activities	Up to an hour	60 (26.3)	<0.001*
	Two to four hours	115 (50.4)	
	More than four hours	53 (23.3)	
Preferences of learning environment in future	A blend of online and traditional learning	131 (57.4)	0.086
	E-learning	56 (24.6)	
	Traditional learning	41 (18)	

* represents significant associations (Chi-square; *p*-value <0.05)

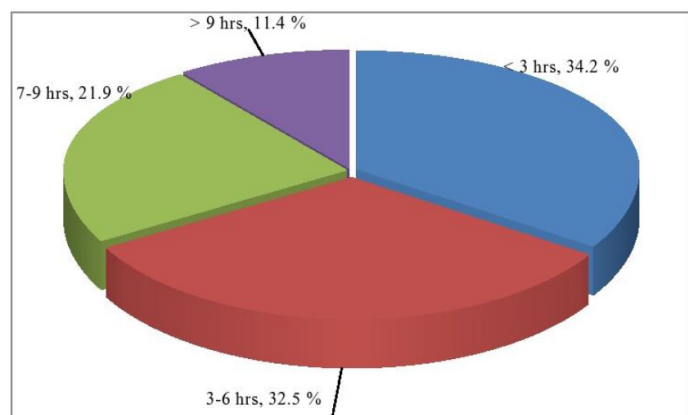**Table 3: Factors Encouraging Students Towards E-learning Across Colleges.**

Variables	n (%)	P value
Flexible time for learning	191 (83.8)	0.204
Easy and effective control of time for completion of assignments	179 (78.5)	0.673
No access limit to electronic learning	179 (78.5)	0.205
The opportunity to learn at one's own pace	174 (76.3)	0.985
Learn appropriate programming skills to do online work	166 (72.8)	0.998
Convenience in electronic communication	166 (72.8)	0.045*
Easier to grasp	163 (71.5)	0.116
Encouragement from close friends/someone	143 (62.7)	0.064
More inspiring to learn electronically outside of class	140 (61.4)	0.770
Easier interaction between instructor and students	138 (60.5)	0.050*
Easier to appear in tests electronically	135 (59.2)	0.597

* represents significant associations (Chi-square; *p*-value <0.05)

Table 4: Problems Encountered During E-learning Across Gender.

Variables	n (%)	P value
Sluggish internet	195 (85.5)	0.010*
Unsure about the content's importance	139 (61)	0.007*
Prefer to learn in class	132 (57.9)	0.580
Lack of interest	130 (57)	0.116
Get confused	127 (55.7)	0.119
Excessive information	119 (52.2)	0.071
Uncertain about where to begin	102 (44.7)	0.048*
Difficult to follow	101 (44.3)	0.827

* represents significant association (Chi-square; *p*-value <0.05)

Figure 1: Normal time spent on the internet for Non-academic activities.

they face numerous issues when taking online classes, including a lack of stimulus and understanding of the study materials, a decrease in communication between students and instructors, and a sense of isolation caused by online classes.[24] On the other hand, students learned the most fundamental concepts using an innovative online interactive and recorded lecture in Blackboard. This is because students have the freedom to study at their own speed in order to improve educational outcomes.[8] Furthermore, online teaching allows for greater flexibility and accessibility to materials.[10,11] Students preferred to meet with the course instructor during office hours for guidance rather than conversing online if they had any questions. This is due to the fact that students get vital information, insight on how to conduct their course work, and overall trust.[24,25] The most effective features of e-learning, according to students, are images, charts, videos, examples, and case studies.[26-28]

More than three-fourth of students consumed four hours a day on internet for academic purposes. On the contrary, almost two-thirds of students spent six hours a day online for non-academic purposes, while the remaining one-third spent seven hours or more a day online for non-academic purposes. The use of the internet for educational purposes is advantageous in terms of increasing knowledge and understanding, but its main drawback is the transition to social media and non-academic activities, which leads to diversion from academic activities and ultimately poor academic results.[29-31]

The most driving aspects for students to adopt e-learning were time flexibility for studying and completing assignments, infinite access to learn and understand at one's own pace, the possibility to obtain necessary programming abilities, and the convenience of communicating electronically. Other driving factors included close mates, easier contact with the instructor, and the ability to appear in tests.[32-34]

Despite the fact that there are numerous motivational aspects to boost electronic learning, there are also numerous obstacles to overcome. Some of them include slow internet, doubt about the content's relevancy, and lack of long-term interest, confusion, and superfluous detail, not knowing where to begin, and being difficult to follow.[24,25,35]

Since both traditional and online learning have benefits and drawbacks, students' choice for the future will be a hybrid of the two. This viewpoint aligns with the outcome of a study conducted by Amir *et al.*[36] When paired online learning with classroom-based learning programs, its effect can be amplified.[12] This hybrid approach refers to a formal combination of online and face-to-face approaches to foster and establish significant communication among course instructors, students, and resources.[13] Integrated online learning offers a lot of flexibility and responsiveness in the process of educating and instructing.[14]

The study's limitation was its small sample size, which was due to the fact that only students from healthcare colleges were recruited. More multi-center studies involving students and instructors are recommended for more detailed findings.

CONCLUSION

Without a doubt, e-learning is a useful instrument for learning fundamental principles and creating new concepts. To emphasize its beauty, images, charts, videos, illustrations, and case studies can all be used. Electronic learning has numerous advantages, but it also has a lot of disadvantages. To summarize, a blend of online and conventional learning is required for optimal results.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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