Faculty and Students' Attitude Toward e-learning at the Start of the COVID-19 Pandemic: A Cross-sectional Study

Nazdar Ezzaddin Alkhateeb[1]*, Ali Shakir Dauod[2], Nazar P Shabila[2], Ali Al-Dabbagh[1]

[1]Department of Medical Education, College of Medicine, Hawler Medical University, Erbil, Iraq.
[2]Department of Community Medicine, College of Medicine, Hawler Medical University, Erbil, Iraq.
*Correspondence to: Nazdar Ezzaddin Alkhateeb (E-mail: nazdar.alkhateeb@hmu.edu.krd)

Abstract

Objectives: This study aimed to assess the students and faculty staff attitude for e-learning at the emergence of COVID-19.

Methods: A prospective cross-sectional Google form based online survey was conducted at a medical university in Iraq between March and April 2020. The online survey was distributed to a sample of 190 faculty staff and 1706 students of a medical university in Iraq. Knowledge and attitudes towards e-learning and perceived barriers to implementing e-learning among participants were the primary outcome measures.

Results: The majority of students had a negative view of the simplicity of using e-learning compared with higher agreement among faculty staff. Most students disagreed with most aspects of the usefulness or strengths of e-learning. Both students and faculty staff agreed that e-learning faces challenges, including poor internet connectivity (79%) and computer literacy (71%). The highest percentage of the students (42.8%) preferred to have paper examinations in the study halls for the final written assessment. The percentages of the faculty staff who preferred paper examination in the study halls (31.6%), online assessment (31.1%), and delay assessment for the following year (33.2%) were almost similar.

Conclusion: The students and faculty staff are not ready for e-learning, with technical inadequacies being the main barrier. Since the COVID-19 pandemic has significantly disrupted medical education, proper technical and institutional foundations are essential for successful e-learning, especially during social distancing measures.

Keywords: E-learning, students' attitude, faculty's attitude, medical education, COVID-19

Retrospectively registered at clinical trial.gov with registration number NCT05223465 on 4th February 2022

Introduction

E-learning in medical education is a relatively new idea that is rapidly growing. It provides education at a generally lower cost and engages learners at a time and location that is most appropriate for them.[1,2] Blended learning (an educational strategy that integrates learning technologies with face to face instructions), augments the advantages of face-to-face education through conducting electronic classes in addition to regular classes. It helps students use real and virtual environments to support their learning.[3,4] Recent calls for reform in medical education and training have emphasized the use of information technology-empowered learning. This was enhanced more in the COVID-19 era.[5]

Kurdistan Region in Iraq is also improving its educational goals to address the challenges of the next generations. E-learning strategies will not be optional any longer. However, obstacles and challenges will always face changes, and these include technological and social challenges. The initiation of e-learning requires pre-assessing students' and faculty's perspectives and attitudes for offering better delivery.[6] Like other parts of the world, the Kurdistan Region of Iraq has recently experienced a lockdown of every part of life, including universities, in response to the COVID-19 pandemic. This urged the universities and other educational institutes to consider e-learning as an urgent substitute. What has helped many universities is that they had their digital learning platforms, but they were not operational at full capacity. Using e-learning has been applied in most universities throughout the globe for medical education. However, the COVID-19 put medical education in challenge regarding clinical sessions, which constitutes the backbone of medical education for teaching the clinical competencies.[6]

Some international organizations, such as the World Health Organization (WHO), have acknowledged e-learning as a helpful tool for healthcare education, particularly in developing countries. Nevertheless, the use of e-learning by the faculty members and students stayed minimum for uploading lecture notes, course books, feedbacks, and providing marks until the COVID-19 pandemic raised that need. This study aimed to evaluate faculty and students' knowledge and attitudes toward e-learning and identify the potential requirements for implementing e-learning.

Materials and Methods

A prospective cross-sectional study was conducted at Hawler Medical University in Kurdistan Region of Iraq during the lockdown, from the 1st of March to the 31st of April 2020. The sample size was calculated using the Daniel formula in an online sample size calculator with a confidence interval of 95%, prevalence of 50%, and a 2% margin of error. The randomly selected students and faculty were invited electronically to participate in the study. They were informed about the objectives and anonymity of the study information. The participants provided online informed consent to participate in the study.

A new study questionnaire was developed for data collection. Previous surveys have guided the study questionnaire development.[7] The final draft was approved by the researchers

who are experts in the field of medical education and drafted using Google survey form and distributed to participants through emails and social media like Viber and Facebook. The questionnaire was composed of five sections. The first section gathered information about the demographic characteristics of students and faculty. The second section included four questions to assess participants' knowledge about e-learning. The third section (seven items) focused on the participants' attitude and behavioral intention to use e-learning. The fourth section contained five questions to explore prior experience of using the internet, types of electronic device owned, and e-learning applications to communicate with colleagues or faculty. They were also asked about the perceived challenges facing e-learning. The last part of the questionnaire focused on participants' opinions about the COVID-19 pandemic, lockdown, and their effects on teaching methods. They were asked about the effect of the COVID-19 pandemic on students' learning and their willingness to continue medical education during this pandemic. Students were asked to indicate their viewpoints on several statements using a 5-point Likert-type scale, ranging from strongly agree to strongly disagree. The research questionnaire is available in the supplementary information.

The validity and applicability of the survey tool were tested through a pilot study. The internal consistency (Cronbach's alpha) estimation of the questionnaire was 0.81, and the reliability coefficient was 0.78.

Data were analyzed using the statistical package for the social sciences (IBM SPSS Statistics Version 25). Frequency and percentage were used to describe the data. The total scores of each component of knowledge, practice, and attitude were calculated by summating the scores of the questions related to that component.

The study protocol was reviewed and approved by the Research Ethics Committee of the authors' institution with meeting code 4/1 on 23rd January 2022 and retrospectively registered at clinical trial.gov with registration number NCT05223465 on 4th February 2022.

Results

A total of 190 faculty staff and 1706 students responded to the survey with response rate of 41.7% and 100% respectively. Only 9.1% of the students had used some components of e-learning in secondary schools.

A low percentage of the students had an idea about e-learning (38.5%), had an interest in guidance on e-learning (39.3%), and used e-learning forms to communicate with

colleagues or faculty (21.8%). A high percentage of students knew about the availability of e-learning facilities at the university (66.2%). Most faculty members had an idea about e-learning (74.7%), had an interest in guidance on e-learning (78.4%), knew about the availability of e-learning facilities at the university (87.4%), and had used e-learning forms to communicate with colleagues and faculty (52.1%), as shown in Table 1.

In terms of the attitude about e-learning, most students had a negative view of the simplicity of using and learning e-learning. They mostly disagreed with e-learning being user friendly (76.4%). Most students disagreed about the strengths of e-learning, particularly about being an interactive mode (60.5%), acquiring better skills (62.9%), easy accessibility, flexibility and interactivity (62%), and allow group discussion for complex topics (64.7%). Most students agreed (strongly agreed or agreed) that e-learning faces challenges, with particular emphasis on poor internet connectivity (75.9%), computer literacy (71.6%), and lack of computers and smartphones (67%), as shown in Table 2.

Regarding faculty's staff attitudes about e-learning, there was a higher agreement with the simplicity of using or learning the e-learning. In comparison, there was more disagreement about the user-friendliness of e-learning (46.8%).

Around one-third of faculty staff agreed (strongly agreed or agreed) with most attitude on e-learning strengths, while more than half of them considered e-learning a supplemental tool and preferred a combination of e-learning and face to face learning. The highest percentage of faculty staff had agreed with the cost-effectiveness of e-learning (46.8%), using it as a supplemental tool (50.6%), and preference for the combination of e-learning and face to face learning (59.5%). Most faculty staff members agreed with all aspects of perception on challenges facing e-learning. The highest agreement was about poor internet connectivity (79%) and computer literacy (71%), as shown in Table 3.

Most of the students (88.7%) and faculty staff (90%) stated that COVID-19 affects the learning process. Most of the students disagreed (strongly disagreed or disagreed) with all aspects of the effect of the COVID-19 pandemic on education, including the willingness to continue education (41.5%), the ability of e-learning to substitute face to face learning for the theoretical part (50.4%) and different clinical, skills lab and other lab learning (66.8–74.4%). Most students disagreed (strongly disagreed or disagreed) with replacing the practical sessions with e-learning (63%) or postponing them to the following academic year (43%) as shown in Table 4.

Table 1. Participants' knowledge about e-learning

Knowledge on e-learning	Students (n = 1706)				Faculties (n = 190)			
	No		Yes		No		Yes	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Having idea about e-learning	1049	(61.5)	657	(38.5)	48	(25.3)	142	(74.7)
Interested in guidance on e-learning	1036	(60.7)	670	(39.3)	41	(21.6)	149	(78.4)
E-learning facility at the institution, e.g., Moodle	577	(33.8)	1129	(66.2)	24	(12.6)	166	(87.4)
Use of e-learning forms to communicate with colleagues or faculties	1334	(78.2)	372	(21.8)	91	(47.9)	99	(52.1)

Table 2. **Students' attitude about e-learning use (*n* = 1706)**

Attitude	Strongly disagree/Disagree		Neutral		Strongly agree/Agree	
	No.	(%)	No.	(%)	No.	(%)
E-learning usage						
E-learning is easy to use	1002	(58.7)	450	(26.4)	254	(14.9)
Learning to use e-learning is easy	924	(54.2)	387	(22.7)	395	(23.2)
It is easy to become skillful at using e-learning	937	(54.9)	386	(22.6)	383	(22.5)
E-learning is user friendly	1304	(76.4)	247	(14.5)	155	(9.1)
Strengths						
Courses readily available online	954	(56.0)	407	(23.9)	345	(20.2)
An interactive mode	1032	(60.5)	429	(25.1)	245	(14.4)
Cost-effective	657	(38.5)	423	(24.8)	626	(36.7)
Complete task more quickly	858	(50.3)	455	(26.7)	393	(23.0)
Attain more knowledge	1006	(58.9)	400	23.4)	300	(17.6)
Acquire better skills	1073	(62.9)	386	(22.6)	247	(14.5)
Easy accessibility, flexibility and interactivity	1058	(62.0)	381	(22.3)	267	(15.7)
Group discussion for complex topic	1104	(64.7)	370	(21.7)	232	(13.6)
A supplemental tool	935	(54.8)	431	25.3)	340	(19.9)
Prefer a combination of e-learning and face-to-face	873	(51.1)	424	(24.9)	409	(24.0)
Challenges						
Lack of computer and smart phone	349	(20.4)	214	(12.5)	1143	(67.0)
Poor internet connectivity	230	(13.5)	182	(10.7)	1294	(75.9)
Computer literacy	248	(14.5)	237	(13.9)	1221	(71.6)
Additional burden	361	(21.1)	668	(39.2)	677	(39.7)
Difficulty in arranging time between faculty and students	339	(19.9)	288	(16.9)	1079	(63.3)
Lack knowledge and information about e-learning	274	(16.1)	357	20.9)	1075	(63.0)

Table 3. **Faculties' attitude about e-learning use (*n* = 190)**

Attitude	Strongly disagree/Disagree		Neutral		Strongly agree/Agree	
	No.	(%)	No.	(%)	No.	(%)
E-learning usage						
E-learning is easy to use	57	(30.0)	77	(40.5)	56	(29.5)
Learning to use e-learning is easy	41	(21.6)	64	(33.7)	85	(44.8)
It is easy to become skillful at using e-learning	41	(21.6)	65	(34.2)	84	(44.2)
E-learning is user friendly	89	(46.8)	52	(27.4)	49	(25.8)
Strengths						
Courses readily available online	46	(24.2)	70	(36.8)	74	(38.9)
An interactive mode	59	(31.1)	73	(38.4)	58	(30.6)
Cost-effective	36	(18.9)	65	(34.2)	89	(46.8)
Complete task more quickly	51	(26.8)	80	(42.1)	59	(31.1)
Attain more knowledge	54	(28.4)	66	(34.7)	70	(36.8)
Acquire better skills	59	(31.0)	67	(35.3)	64	(33.7)
Easy accessibility, flexibility and interactivity	61	(32.1)	72	(37.9)	57	(30.0)
Group discussion for complex topic	65	(34.3)	65	(34.2)	60	(31.6)
A supplemental tool	35	(18.4)	59	(31.1)	96	(50.6)
Prefer a combination of e-learning and face-to-face	31	(16.3)	46	(24.2)	113	(59.5)

(Continued)

Table 3. **Faculties' attitude about e-learning use ($n = 190$)—Continued**

Attitude	Strongly disagree/Disagree		Neutral		Strongly agree/Agree	
	No.	(%)	No.	(%)	No.	(%)
Challenges						
Lack of computer and smart phone	37	(19.5)	40	(21.1)	113	(59.5)
Poor internet connectivity	14	(7.4)	26	(13.7)	150	(79.0)
Computer literacy	18	(9.5)	37	(19.5)	135	(71.0)
Additional burden	26	(13.6)	79	(41.6)	85	(44.8)
Difficulty in arranging time between faculty and students	33	(17.3)	45	(23.7)	112	(59.0)
Lack knowledge and information about e-learning	18	(9.5)	55	(28.9)	117	(61.6)

Table 4. **Students' perspectives on the effect of COVID-19 pandemic on education and the alternative study options ($n = 1706$)**

Item	Strongly disagree/Disagree		Neutral		Strongly agree/Agree	
	No.	(%)	No.	(%)	No.	(%)
Effect of COVID-19 pandemic on education						
Willing to continue education	709	(41.5)	419	(24.6)	578	(33.9)
E-learning can replace face-to-face learning for the theoretical part	861	(50.4)	348	(20.4)	497	(29.1)
For the practical part, e-learning can replace learning gained in:						
Clinical placement in hospital wards	1268	(74.4)	246	(14.4)	192	(11.2)
Clinical placement in the outpatient clinic and PHC	1192	(69.9)	308	(18.1)	207	(12.1)
Skills lab and other labs	1140	(66.8)	304	(17.8)	262	(15.4)
If it was impossible to arrange for practical sessions due to this pandemic, what would be the best way to replace them						
E-learning	1075	(63.0)	349	(20.50)	282	(16.5)
Postpone for the next academic year	735	(43.0)	382	(22.40)	589	(34.5)

Almost half of the faculty staff agreed (strongly agreed or agreed) with the willingness to continue education (43.7%) and the ability to substitute face to face learning by e-learning for theoretical parts (51%). Most of them disagreed with e-learning replacing the different components of the practical parts (63.7–80.5%). The highest percentage of faculty agreed with replacing practical sessions with e-learning. Those who agreed with postponing practical sessions to the following academic year were slightly higher (37.4%) than those who disagreed (31%) as shown in Table 5.

A higher proportion of students preferred performing the final written assessment as paper examinations in the study halls (42.8%) than delaying the examination for the following academic year (28.5%). The percentages of the faculty who preferred paper examination in the study halls (31.6%), online assessment (31.1%), or delaying it for the following year (33.2%) were almost similar.

Discussion

The novel innovations in e-learning have revolutionized the learning and teaching process, and thus students and educators need to adapt in utilizing them; the COVID-19 pandemic further accelerated that need. Only few studies have been carried out in Iraq on e-learning.[8-10] To the best of our knowledge, the current study is the first in Iraq to assess the knowledge, attitude, and perception of e-learning among students and faculty during the lockdown period.

The majority of our students are using the internet, at least sometimes, and they have the means to do so, though less than a half use laptop. This would suggest a good technological base to implement e-learning. Similar results were obtained in other studies,[1,11] which is expected from digital natives.

Although two-thirds of the students knew about the availability of e-learning facilities at their school, slightly over a third knew about e-learning and were interested in guidance on it. Only less than a third used it for communication; this agrees with other studies.[12,13] Like many other educational institutes, this may be because the school does not use e-learning to its full potential as an educational resource but rather as a limited modern technology project.[14] The average knowledge and limited usage of e-learning were reflected in their attitudes towards it, as two-thirds of them opposed its potential usefulness, namely, being an interactive, reachable, and flexible platform and appropriate for discussion on complex subjects and enhance their skills. Many authors have studied students' perceptions, and some had similar results to ours.[1,15] Keller and Cernerud (2002) stated that if students with

Table 5. Faculties' perspectives on the effect of COVID-19 pandemic on education and the alternative study options (n = 190)

Item	Faculties (n = 190)					
	Strongly disagree/Disagree		Neutral		Strongly agree/Agree	
	No.	(%)	No.	(%)	No.	(%)
Effect of COVID-19 pandemic on education						
Willing to continue education	39	(20.6)	68	(35.8)	83	(43.7)
E-learning can replace face-to-face learning for the theoretical part	40	(21.1)	53	(27.9)	97	(51.0)
For the practical part, e-learning can replace learning gained in:						
Clinical placement in hospital wards	153	(80.5)	26	(13.7)	11	(5.80)
Clinical placement in the outpatient clinic and PHC	143	(75.3)	34	(17.9)	14	(7.4)
Skills lab and other labs	121	(63.7)	45	(23.7)	24	(12.6)
If it was impossible to arrange for practical sessions due to this pandemic, what would be the best way to replace them						
E-learning	79	(41.6)	65	(34.2)	46	(24.2)
Postpone for the next academic year	59	(31.0)	60	(31.6)	71	(37.4)

e-learning experience were enrolled in their study, the disappointing results might have changed.[15] We genuinely believe that this would have been the case in our results as well. In studies where good experience with e-learning was present, the perception was very good.[16,17]

The majority of our faculty staff had knowledge about availability of e-learning facilities in the university, had good knowledge about e-learning, and used it. The attitude of the faculty was equivocal about e-learning's usefulness in teaching and learning. About 60% of them preferred a blended program which involve mixture of e-learning and face to face learning. A better response was observed by another study from South Korea.[18] This equivocal response may be due to the faculty's continuous efforts to provide new learning resources on the one hand and to the limited time available to learn the new technologies on the other hand.[19,20] According to responses, e-learning has other benefits that includes but not limited to, aids in freeing up the on-campus timetable, allowing more time to deliver more complex subjects, a greater opportunity for a higher level of cognitive learning, and, reducing the time needed for the pre-lab explanation in laboratories and skills labs.[21-23]

The literature shows that there are obstacles to the implementation of e-learning; these include problems related to technology, resources, skills, institutional strategies, and support. Both students and faculty staff highlighted poor internet connectivity and a lack of hardware as the main technical obstacles to e-learning. Similar findings were observed by others.[24] Other technology barriers include, learning management systems, and digital library, among others.[2] Essential prerequisites of e-learning quality include basic infrastructure maintained with regularly updated technologies, technical support, a sound and clear institutional policy and guide for both students and faculty staff.[4,18,25]

COVID-19 has disrupted education worldwide. Most of our students and faculty staff agree with that too. The pandemic has obliged universities all over the world to cease campus learning to control the spread of the disease. However, in times of suffering, there is always a hope. The pandemic forced the teaching community to search for alternatives.

Many have moved to e-learning to secure the continuance of teaching and assessment.[26–28] About half of our students were skeptical of the ability of e-learning to substitute face-to-face learning for the theoretical part. Half of them were willing to attend practical sessions if the situation permits, and two-thirds disagreed that e-learning can replace practical training. Almost similar results were obtained from the faculty staff. However, the reason behind the indeterminate response from our students and faculty staff could be their general attitude towards e-learning or the pandemic's direct distressful effect. Cao et al. and Li et al. concluded that 24.9% and 27% of their students had significant distress during the outbreak.[29,30]

Limitation of the Study

The study participants were from one university and generalization of the result for all medical students is not possible. The study was conducted at the emergence of COVID-19 pandemic with high uncertainty among students about the fate of their study and assessment.

Conclusion

Most students had concerns about using e-learning and its usefulness, while faculty staff were more comfortable with its use. Poor internet connectivity and computer literacy were the main challenges of applying e-learning. The students generally preferred to have paper examinations in the study halls for their final written assessment. However, the faculty staff preference was similarly distributed among paper examination in the study halls, online assessment, and delaying assessment for the following year. The findings from this study shows that our students and faculty are not quite ready for e-learning. This could be due to technical barriers, as well as inadequate institutional preparedness and support. It also shows that the COVID-19 pandemic has significantly disrupted medical education. Thus, proper technical and institutional foundations are essential for successful e-learning, especially during social distancing measures.

Authors' Declaration

- Conflicts of Interest: None.
- We hereby confirm that all the Tables in the manuscript are ours.
- Ethical Clearance: The project was approved by the local ethical committee in College of Medicine, Hawler Medical University.

Authors Contribution

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