

UNDERGRADUATE MEDICAL STUDENTS' PERCEPTION OF ONLINE LEARNING AND ASSESSMENT DURING THE COVID-19 PANDEMIC: AN EGYPTIAN EXPERIENCE

BY

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ABSTRACT

Coronavirus disease 2019 (COVID-19) pandemic had disturbed the educational systems worldwide, students have been affected as schools, colleges, and universities are locked down to prevent virus spread (UNESCO, 2020a). Thus, shifting to distance learning was the only mandatory choice in many educational institutions globally (UNESCO, 2020b). The research objectives: To measure undergraduate medical students' **perception** regarding online learning in forensic medicine and toxicology course during COVID-19 pandemic. **Methods:** A cross-sectional study was conducted upon 99 students of 5th year medical students in academic year (2020-2021) at Faculty of Medicine; Suez Canal University who experienced online learning and online formative assessments. Data was collected through a semi-structured questionnaire. The collected response was 99, which is adequate for factor analysis. Results of factor extraction revealed that the 19 questionnaire items could be grouped under five factors which accounted for 69.39% of the total variance.

Results: The findings of the study disclose students' affirmative perception in respect of online learning and thus approval of this novel learning approach. It has also experimentally demonstrated the value of online learning and assessment in the time of COVID19 catastrophe. Our results showed that satisfaction with the e-learning process and with the quality of learning in online sessions. Furthermore, satisfaction with interaction in online sessions. Based on the findings, the blended learning was the most preferred method in general for the coming years of the study (after pandemic COVID 19).

Conclusion: The study revealed that the online learning and assessment has been approved and accepted by the students in our course (Forensic Medicine and Toxicology course).

Keywords: *Distance Learning, Online assessment, Forensic and Toxicology course, COVID-19 Pandemic*

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INTRODUCTION

Coronavirus disease 2019 (COVID-19) pandemic has multiple effects in multiple aspects in life, the educational systems was affected worldwide as schools, colleges, and universities were locked down to control virus spread (UNESCO, 2020a). Thus, shifting to online learning was mandatory choice in several educational institutions worldwide (UNESCO, 2020b). However, these efforts, students, lecturers are still facing challenges

from this educational shift (Mukhtar et al., 2020). This shift from traditional ways to virtual mode without planning (Patra et al., 2021a). The main challenge is that practical training for staff, teachers and students was missing (Patra et al., 2021b). Therefore, it is important to follow up this shift with the aim to overcome future obstacles. (Ferrel and Rayan, 2020). Pather et al. (2020) classified the challenges during into four categories: staff challenges, students, resources, and curriculum.

The forensic and toxicology course was introduced to 5th year medical students at Faculty of Medicine Suez Canal University (FOM-SCU) in Egypt, all over two semesters; each part is divided into 12 weeks one for forensic medicine and the other is for toxicology. In normal situation, students attend lectures followed by practical sessions. For lectures, data were presented by Power Points slides. Practical sessions were conducted by assistant staff members. The resources available for students are textbooks available in the college library. Student summative assessment is conducted at different periodic times of each semester, one in January, second on June and third final assessment by the end of the academic year. It included written, spot practical, and other scientific activities. Following the announcement of pandemic of Covid-19, the government closed all institutions across the country from March 15, 2020; then, it was extended until the end of the school year (*May, 2020*) to prevent the spread of the virus. Meanwhile, 26 million students continued their study remotely for the first time through online lectures in the Egyptian Health institutions, as suspension of ordinary traditional and face to face classes and shift to remote teaching has been urgently required (*Bozkurt et al., 2020; Enterprise, 2020; UNICEF, 2020*).

This suspension of classes came into the second semester. Therefore, completing the course for the second semester was the major challenge (*Saber, 2021*). The Ministry of Higher Education and Scientific Research instructed universities to shift the traditional onsite educational methods to online learning. The lectures have been introduced in the form of live lectures through different video conference apps like Zoom or Microsoft teams, or through uploading a video recorded of the PowerPoint presentations, through Google drive link on SCU platforms, and students can download them and view on their computers or smart phones at home (*Saber, 2021*). In some universities, the lecturers' files were either sent to students through Whats App groups,

Telegram Channel, uploaded on Facebook or on university Learning Management System (Moodle), (*Bozkurt et al., 2020; Saber, 2021*). Students who encountered Internet-related problems like in South and North Saini governorates had the opportunity to obtain a CD or a flash drive containing the lectures (*Saber, 2021*). Examinations for the second semester have been canceled and replaced by essays or research articles on certain topics. (*Bozkurt et al., 2020; Saber, 2021; Shehata et al., 2020*). While practical examinations were replaced by online multiple-choice questions with a Pass/Fail grade system (*Saber, 2021*). However, the online assessment has challenges, such as security, internetconnection, technical problems, reliability, difficulty to assess different skills, and plagiarism (*Consorti et al., 2021; Shehata et al., 2020*).

The lack of the online teaching facilities and lack of prior experience made the forced transition to online teaching during the pandemic particularly difficult in Egypt (*Shehata et al., 2020*). Subsequently, the Supreme Council of Egyptian Universities had announced the implementation of a "hybrid education" model, which merged traditional learning in lecture halls and online learning activities, starting from the academic year 2020–2021 to reduce the density of students inside each educational hall. Therefore, it is crucial to measure the students' perception and their recommendations for the future incorporation of this model in Egyptian universities (*El Said, 2021*). This study aimed to measure the effectiveness of online learning and assessment used in forensic medicine and toxicology course during COVID-19 pandemic from 5th year medical students' points of view

The research objectives

to measure undergraduate medical students' perceptions regarding online learning in forensic medicine and toxicology course during COVID-19 pandemic. And to evaluate undergraduate medical students' perceptions regarding use of periodic online formative quizzes during forensic medicine and toxicology course during COVID-19 pandemic.

SUBJECTS AND METHODS

Study context and design

A cross-sectional study that was conducted on male and female 5th year medical students at the Faculty of Medicine, Suez Canal University, Egypt who experienced forensic and toxicology online course at the academic year 2020-2021.

Study population: 5th year medical students (165) in academic year (2020-2021) at FOMSCU who experienced with online learning and online formative assessments every 2 weeks in the form of five multiple choice questions all over the period of the toxicology course.

Sampling: we used a voluntary response sampling technique from 5th-year medical students at FOMSCU. It was calculated using automatic online calculator available at: <https://www.calculator.net/sample-size-at> 80% proportion, the sample size was 99 out of 165 study population, with confidence level of 95% that the real value is within $\pm 5\%$ of the measured/surveyed value. We targeted a response rate 80%.

Data Collection tool:

Data was collected by an online questionnaire that was adopted and modified by the research team, based on review of the relevant literature (Atwa et al., 2022; Frazer et al., 2017). It elicited the students' gender, electronic devices used to access the online learning materials and online quizzes, their experience about remote forensic medicine and toxicology teaching and online formative assessment. Also, if they had any technical difficulties during their online experience. The questionnaire contained 20 items on a Likert scale that had 5 options. Each option was given a score that ranged from 1 that was given to "strongly disagree" response, to 5 that was given to "strongly agree" score. So, the satisfaction scores ranged from 20-100. The 20 items were distributed under three domains, which are: social presence and interaction, satisfaction during online sessions, and online formative assessment implemented during toxicology course (*Mulyanti et al., 2020*). Finally, students were asked to choose which mode of learning they prefer for this

course (online or face to face or blending learning). The online questionnaire link on google form

<https://docs.google.com/forms/d/e/1FAIpQLSfK1n9obO5ZbQq2tdI5B627FiievOfOx8ufAzgpeNXSulV8Rw/viewform>

To determine the suitability of the questionnaire, validity and reliability studies were conducted. Validity was established through Exploratory Factor Analysis (EFA). The content validity was assessed through reviewing the questionnaire items by an expert opinion from medical education department. For face validity, a pilot testing of the questionnaire was done prior to starting the data collection on 20 participants, their responses were excluded later from the study sample, each item of the questionnaire was checked for vagueness and the appropriateness of the questions. Modifications were made based on the analysis of the resultant data (for example, response rate, skipped questions; debriefing session concerning the length of the questionnaire, its difficulty, its readability, order of the questions, structure of the questions; analysis of the responses to determine if they were within the parameters of what is anticipated and constructed). Reliability was measured through Cronbach's alpha test.

Statistical analysis

Analysis of the questionnaire:

Data from the questionnaire was coded, entered, and analyzed using a basic statistics program: statistical package for social sciences (SPSS) software version 25. Descriptive statistics were used to summarize the data. Data was represented as frequencies (n) and percentages (%) for categorical variables. Chi-square test was used to determine the association between different variables. Correlation tests were used to determine the relationship between some variables whether this relationship was positive or negative and its strength. P-value of (< 0.05) was considered statistically significant. Data was presented in tables and graphs.

Ethical considerations

Ethical clearance for the study was obtained from the FOM-SCU Research Ethics Committee (REC) (Research 4939) in accordance with the Declaration of Helsinki for human studies (*World Medical Association Declaration of Helsinki, 2008*). Participants' informed consent was obtained before implementing the study. They were informed about study aims, were kept updated about any changes in the research and were given the full right to refuse participating. Ethical conduct was maintained during data collection and throughout the research process. The confidentiality of the participants was maintained as the questionnaire was provided anonymously. One of the authors' contact information was available for the participants on the online questionnaire to provide any needed clarification and consultation.

RESULTS

Section I: Validity and Reliability of the Newly Developed Questionnaire:

RESULTS OF THE VALIDITY STUDY:

A. Content Validity:

The medical education experts who reviewed the questionnaire recommended a few modifications to some items. Such modifications have been discussed between the researchers and were made accordingly before the questionnaire made ready for administration to the participants. The recommended modifications were mainly in the form of editing a few items to make them clear to the participants, giving examples of the e-learning platforms, and adding an item on learning environment in e-learning sessions.

B. Exploring construct validity through Exploratory Factor Analysis (EFA):

1. Checking the suitability of data for factor analysis:

The collected responses were 99, which is adequate for factor analysis. Analysis of data adequacy indicated an adequate amount of data for factor analysis Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) was 0.793 and Bartlett's Test of Sphericity $\chi^2(171,$

$N=99)=1074.459, p=0.00$). So, this indicates that the data is appropriate for factor analysis.

2. Extraction of factors:

Results of factor extraction revealed that the 19 questionnaire items could be grouped under five factors with an eigenvalue > 1.00 . Those five factors accounted for 69.36% of the total variance.

3. Rotation of factors:

Factor rotation showed that three heterogeneous items grouped under one factor. Upon critically reading those three items, the authors found that two of them could be reallocated under two logically related factors. This factor remained with only one item, so it was deleted. The cumulative variance accounted for by the four factors became 60.69%.

So, the questionnaire was composed on 18 items under four factors, where a) all the factors had more than three items, b) no items had cross-loading between factors, and c) all items had a loading of > 0.30 on the relevant factor.

The factors were named according to the heaviness of loading of the items on each factor and based on the idea behind the item (**Table 1**) as follows:

- Factor 1 explained 18.49% of the variance in responses, with an eigenvalue of 6.66. Five items loaded on this factor, with values between 0.586 and 0.918. This factor has been renamed to "*Satisfaction with Online Formative Quizzes*". This factor addresses the benefits and importance of conducting online quizzes.

- Factor 2 explained 16.30% of the variance in responses, with an eigenvalue of 2.61. Five items loaded on this factor, with values between 0.533 and 0.810. This factor has been renamed to "*Satisfaction with the e-Learning Process*". This factor addresses the process of e-learning in the course and the utilized platforms.

- Factor 3 explained 14.76% of the variance in responses, with an eigenvalue of 1.57. Four items loaded on this factor, with values between 0.649 and 0.833. This factor has been renamed to "*Satisfaction with the Quality of Learning in Online Sessions*". This factor addresses the quality of learning and the help of the feedback

from the teachers, as well as the learning environment in online sessions.

- Factor 4 explained 11.15% of variance in responses, with an eigenvalue of 1.30. Four items loaded on this factor, with values between 0.609 and 0.771. This factor has been renamed to “*Satisfaction with Interaction in Online*

Sessions”. This factor addresses the interaction and communication between peers in online sessions.

RESULTS OF THE RELIABILITY STUDY:

Test of reliability (internal consistency) revealed high reliability of this questionnaire (Cronbach’s $\alpha = 0.89$).

Table (1): Factor Loadings of Questionnaire’s Items under the Four Factors (Using Principal Components Analysis):

Factor Renaming	Item Statements	Factors			
		1	2	3	4
Satisfaction with Online Formative Quizzes	Online quizzes were valuable learning activities	0.918			
	Online quizzes helped me to identify areas of weakness (knowledge gap)	0.891			
	Online quizzes motivated me to study on a regular basis	0.870			
	Online quizzes helped me reflect on my learning	0.757			
	Online quizzes should be conducted regularly for all students	0.586			
Satisfaction with the e-Learning Process	E-learning improved my course performance as I didn’t waste much time commuting to college, but studied at the comfort of my home		0.810		
	I believe the e-learning platforms Moodle and Telegram were user-friendly		0.782		
	E-learning platforms used in the course (Moodle and Telegram) made it easy for me to find necessary information related to the course		0.682		
	My level of understanding from interactive online lectures was nearly the same as face-to-face		0.658		
	E-learning enabled me to study and follow my lessons, irrespective of my location		0.533		
Satisfaction with the Quality of Learning in Online Sessions	I could ask questions and get immediate feedback in online sessions same as in face-to-face ones			0.833	
	Learning environment in the online sessions was motivating			0.711	
	Discussions in online sessions helped me in deep understanding of the others’ points of view			0.677	
	Online chatting with the course coordinator around the course requirements was welcomed			0.649	
Satisfaction with Interaction in Online Sessions	There was good interaction among students when participating in interactive lectures in e-learning				0.771
	Instructors facilitated discussions in the interactive online sessions				0.766
	Quality of interaction among students in online sessions was high				0.696
	Strong social relationships could be built during online sessions				0.609
	Variance (%)	18.49	16.30	14.76	11.15

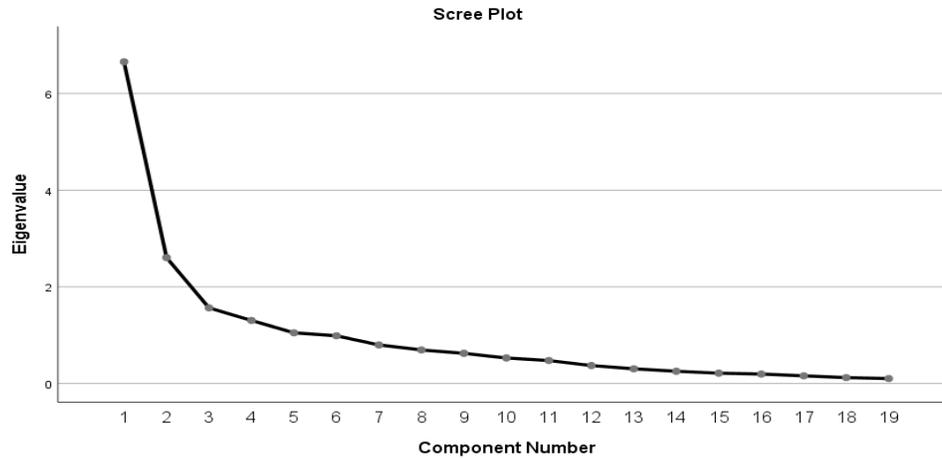


Figure (1): Scree Plot of Exploratory Factor Analysis

Section II: Questionnaire Results:

A total of 99 students participated in this study. The majority of participants were female students (65.7%) (Figure1).65.7% of students participated in all online quizzes (5 quizzes), 18,2 % of them participated 4 times, and 8% participated in only 3 online quizzes (Figure2).

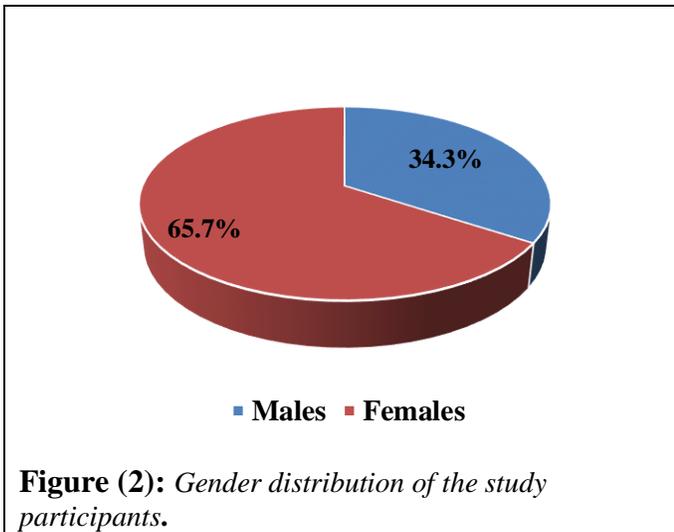


Figure (2): Gender distribution of the study participants.

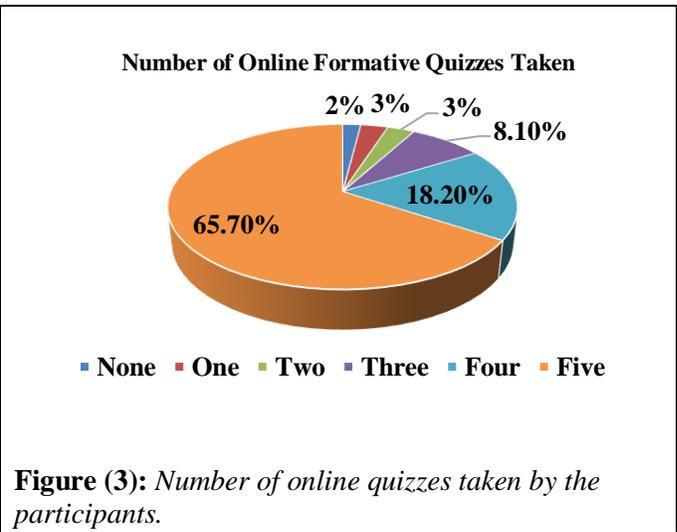


Figure (3): Number of online quizzes taken by the participants.

For joining online lectures, 59.5% of students used smart phones, 31.7% used their laptop computer, 6.3% used desktop computer, while only 2.5% used tablet device in the other side in joining online quizzes 65.8% of students used their smart phones, 29.9% of them used laptop computers, 2.6% used tablet device and 1.7% used desktop computers (Table 2).

Regarding facing technical difficulties during participation in online lectures and quizzes, the majority of students (42.2%) reported that they

rarely faced technical difficulties while joining online lectures, and 38.4% sometimes faced it in participating in online lectures, while regarding participation in online quizzes, nearly half students (48.5%) sometimes faced technical difficulties during participation in it and 19.2% of students rarely facing these difficulties in participation in these online quizzes .the statistical relation between both frequency of facing technical difficulties during

participation in online lectures and quizzes are significant (p value =0.001) (Table 3)

Table (2): Electronic devices used in participation in online lectures and quizzes:

Electronic Device	Lectures		Quizzes	
	Frequency	Percentage	Frequency	Percentage
Smartphone	75	59.5%	77	65.8%
Tablet Device	3	2.5%	3	2.6%
Laptop Computer	40	31.7%	35	29.9%
Desktop Computer	8	6.3%	2	1.7%
Total Number of Responses*	126	100%	117	100%

* The total number of responses is more than the number of study participants because several students reported the use of more than one device for participation in both lectures and quizzes.

Table (3): Frequency of facing technical difficulties during participation in online lectures and quizzes:

	Always	Very Often	Sometimes	Rarely	Never	Chi ²	Sig.
Facing technical difficulties ...							
during lectures	4 (4%)	3 (3%)	38 (38.4%)	42 (42.4%)	12 (12.1%)	17.1	0.001*
during quizzes	5 (5.1%)	14 (14.1%)	48 (48.5%)	19 (19.2%)	13 (13.1%)		

* Statistically significant

Table (4): Perceived meaning of e-learning from participants' points of view:

Perceived Meaning	Frequency	Percentage
Having live synchronous lectures over the internet	46	26.14%
Learning by watching pre-recorded videos	39	22.16%
Online learning	60	34.1%
Learning on your own at your own space	27	15.3%
Have no idea	4	2.3%
Total Number of Responses*	176	100%

* The total number of responses is more than the number of study participants because several students chose more than one perceived meaning for e-learning.

34.1% of students Perceived meaning of e-learning as online learning, while 26.14% perceived it as having live synchronous lectures over the internet, 22.16% perceived it as learning by watching pre-recorded videos, and 15.3% perceived it as learning on their own at their own space (Table 4)

Table 5: Most liked method of learning in Forensic Medicine and Toxicology course:

Method of Learning	Frequency	Percentage
Interactive synchronous sessions over the internet	47	47.5%
Watching recorded sessions	26	26.3%
Face-to-face sessions	26	26.3%
Total	99	100%

47% of students liked interactive synchronous sessions over the internet in forensic and toxicology course over 26.3% of them liked watching recorded sessions, and the same percentage (26.3%) liked face to face sessions in learning the same course (Table 5).

49.5% of students prefer blended learning (blending online with face-to-face modes) after pandemic for learning in the coming years of study, while 30.3% prefer online learning, and 20.2% preferred face to face learning (Table 6).

Table (6): Most preferred method of learning in general for the coming years of study (after the pandemic):

Method of Learning	Frequency	Percentage
Face-to-face learning	20	20.2%
Online learning	30	30.3%
Blended learning (blending online with face-to-face modes)	49	49.5%
Total	99	100%

Table (7): Satisfaction with the different components of the e-learning experience during the Forensic Medicine and Toxicology course:

Presentation 1: Frequency distribution:

S. Item	Agree	Neutral	Disagree
	No. (%)	No. (%)	No. (%)
Satisfaction with Online Formative Quizzes			
1 Online quizzes were valuable learning activities	87 (87.9%)	10 (10.1%)	2 (2%)
2 Online quizzes helped me to identify areas of weakness (knowledge gap)	89 (89.9%)	10 (10.1%)	0 (0%)
3 Online quizzes motivated me to study on a regular basis	89 (89.9%)	9 (9.1%)	1 (1%)
4 Online quizzes helped me reflect on my learning	79 (79.8%)	17 (17.2%)	3 (3%)
5 Online quizzes should be conducted regularly for all students	59 (59.6%)	28 (28.3%)	12 (12.1%)
Satisfaction with the e-Learning Process			
6 E-learning improved my course performance as I didn't waste much time commuting to college, but studied at the comfort of my home	78 (78.5%)	16 (16.2%)	5 (5%)
7 I believe the e-learning platforms Moodle and Telegram were user-friendly	84 (84.8%)	11 (11.1%)	4 (4%)
8 E-learning platforms used in the course (Moodle and Telegram) made it easy for me to find necessary information related to the course	90 (90.9%)	9 (9.1%)	0 (0%)
9 My level of understanding from interactive online lectures was nearly the same as face-to-face	73 (73.8%)	12 (12.1%)	14 (14.1%)
10 E-learning enabled me to study and follow my lessons, irrespective of my location	83 (83.8%)	11 (11.1%)	5 (5%)
Satisfaction with the Quality of Learning in Online Sessions			
11 I could ask questions and get immediate feedback in online sessions same as in face-to-face ones	89 (89.9%)	9 (9.1%)	1 (1%)
12 Learning environment in the online sessions was motivating	75 (75.7%)	18 (18.2%)	6 (6.1%)
13 Discussions in online sessions helped me in deep understanding of the others' points of view	82 (82.8%)	9 (9.1%)	8 (8.1%)
14 Online chatting with the course coordinator around the course requirements was welcomed	89 (89.9%)	8 (8.1%)	2 (2%)
Satisfaction with Interaction in Online Sessions			
15 There was good interaction among students when participating in interactive lectures in e-learning	92 (92.9%)	5 (5.1%)	2 (2%)
16 Instructors facilitated discussions in the interactive online sessions	86 (86.9%)	8 (8.1%)	5 (5.1%)
17 Quality of interaction among students in online sessions was high	91 (91.9%)	6 (6.1%)	2 (2%)
18 Strong social relationships could be built during online sessions	65 (65.6%)	22 (22.2%)	12 (12.2%)

Table (8): Correlation between satisfaction with the different components of the e-learning experience during the Forensic Medicine and Toxicology course:

		Satisfaction with Online Formative Quizzes	Satisfaction with the e-Learning Process	Satisfaction with the Quality of Learning in Online Sessions	Satisfaction with Interaction in Online Sessions
Satisfaction with Online Formative Quizzes	Pearson Correlation		0.631	0.699	0.288
	Sig. (2-tailed)		0.000**	0.000**	0.004**
Satisfaction with the e-Learning Process	Pearson Correlation	0.631		0.765	0.326
	Sig. (2-tailed)	0.000**		0.000**	0.001**
Satisfaction with the Quality of Learning in Online Sessions	Pearson Correlation	0.699	0.765		0.464
	Sig. (2-tailed)	0.000**	0.000**		0.000**
Satisfaction with Interaction in Online Sessions	Pearson Correlation	0.288	0.326	0.464	
	Sig. (2-tailed)	0.004**	0.001**	0.000**	

**Correlation is significant at the 0.01 level (2-tailed).

DISCUSSION

The basic goal of this study was to measure the effectiveness of online learning and assessment methods used in forensic medicine and toxicology course during COVID-19 pandemic from 5th year medical students' points of view. A large number of students in our course Forensic Medicine and Toxicology accepted and were satisfied with the online learning and assessment. During the health crisis COVID-19 pandemic.

We noticed that Smartphone was the highest frequency rate among electron devices, followed by laptop. Our findings revealed that facing technical difficulties was rare during lectures. And sometimes during quizzes. As evident from the study, online learning was the perceived meaning of e-learning from participants, points of view. We found that blended learning (blending online with face to face modes) is the most preferred method in general for the coming years of study (after pandemic). The results from this study showed that, satisfaction with online formative quizzes and with e-learning process as well. Also, satisfaction with both quality of learning in online sessions and interaction in online sessions.

The results presented here was consistent with *Motte et al., (2021)* that showed online programs were perceived as convenient ways of different aspects of education as teaching, learning, and assessment during COVID pandemic. On the other hand, previous studies indicated that the distance learning is still in the expansion and growth stage, and conventional face to face classes appeared to be vital and needed. However, there is a positive perspective and orientation of the major part of students to involve and participate in distance and e-learning classes in the post-COVID19 pandemic (*Ismaili, 2021*).

Our findings are partly consistent with previous studies which indicated that distance education provides a valuable and rewarding different approach during the COVID-19 pandemic. Appropriate planning and willingness, an excellent fineness of the Internet, and student engagement activities are preferable and advisable to upgrade the quality of learning, teaching and assessment process (*FaizTuma et., al 2021*). Previous studies have confirmed and interpreted their findings as a recent and a new conception of e-learning and online assessment during the time of crisis, such as the COVID pandemic (*Meccawey et al., 2021*).

In agreement with (*Kumar et al., 2021*) that stated that the standing of e- learning has a remarkable positive relation with students 'satisfaction. To perform the students 'satisfaction, the colleges should struggle and strive for submitting the e-learning curriculum and content of excellent quality.

To reduce the technical difficulties on learning and assessment, a previous study pointed out the need to be familiar with online curriculum and systems to be efficient educators. Educational establishments should be actively training their educational personnel on different approaches and apparatus, to prepare for future online learning opportunities (*Bdair and Izzeddi, 2021*).

Interestingly, our results are consistent with previous studies which reported that distance and e- learning is considered as an excellent alternative to the traditional physical attendance and face to face classes, especially at the time of disasters. The adoption of distance and e- learning requires College engagement, selection the proper and convenient digital educational platforms, planning and organizing an educational curriculum which expected to meet the learning goals of the College, at the time of pandemic infections (*Zayapragassarazan, 2020*).

Bdair, (2021) encouraged and fostered the use of distance and online learning during the crises, especially pandemic infection. Recommendations have been submitted to promote the online learning are extremely important to perform more distinguished education.

The teaching staff of the College considered online learning is not only a convenient alternative at the time of pandemic infection, but also improves students 'awareness and engagement in the learning process to achieve the philosophy of the learning goals (*Mukhtar et al., 2020*).

In agreement with (*Gismalla, et al., 2021*) the majority of medical students had accepted and satisfied the perception of E-learning. However, many an inhibitory factors threat utilizing electronic technologies for medical educational

process. For instance, the poor quality of internet and the accessibility of the lab top or Smartphone, it is not usually available for the entire medical students.

Some of the previous studies partly in agreement with our findings, the challenges of teaching arising out of the different situation were motivators behind the creation of new innovative e-learning clinical vignettes. Efforts of the stakeholders that encompasses the medical students, tutors, and demonstrators, were cooperated and collaborated to obtain and maintain the quality of medical education (*Machado et al., 2020*), and to keep medical students socially, and professionally in contact with patients in their approach to become physicians via e-learning clinical vignette. Early results on students' perception of e-learning reported optimism about the learning experience (*O'Neill et al., 2011*) however, some studies found that their medical students did not prefer and support e-teaching over face-to-face teaching (*Abbasi et al., 2020*) and most of them have liked and preferred returning to the clinical rounds, not only in wards, inside hospitals. But also teaching clinically all the time, such as teaching on the run, everywhere in the hospitals (*Compton et al., 2020*).

One strength of this work is that it renders credibility to the previous studies regarding students' perspectives on the value and validity of education and evaluation practices online, during crisis and pandemic infection.

Limitation of the study

Despite the interesting findings of the data, Needless to state, that our work has some limitations, arising from teaching and evaluating just one course (Forensic and Toxicology).

The small sample size from one medical school (Suez Canal University), has to be considered. We may have not surveyed some groups of students, particularly those who have no access to Smartphone. And this might explain the response is just 60% of the sample.

The crucial point expected to be learned from this education experience is that online learning

approach applied on an urgent basis is completely different from those used with planning and preparation. From a methodological perspective, we relied purely on self-assessments and subjective estimations of learning and attitudes. Even though the results are consistent with educational notions, personal opinions and self judgment by students must be estimated with some caution. Even though with available translation.

With the advent of information technology IT, creating, adopting and implementing a comprehensive new IT security is an urgent and pervasive challenge for many educational institutions. This topic could be handled and not underestimated in the future. That is why we do recommend professional training will incorporate high skill levels in the use and application of information technology, to give our students the education they deserve even at the time of COVID 19.

Recommendations

Cyber security is an intimidation to the assessment of the online process. Therefore, Safety procedures (Authenticity, integrity and confidentiality) must be available during the assessment process whether informative or summative, of the online course. Establishing a training program for every single one might be responsible of the educational process. Such as students, medical college administrators, researcher, residents. And the teaching staff. Planning for future educational and training program based on both online learning and face to face education.

Establishing an electronic library, to be considered as a great source for educational process and medical education as a science and art of medicine. The e- library should encompass a software that aims to prevent cheating during online assessments . Highlighting the concept of self directed learning, spiral approach learning, and the concept of integration of basic and clinical sciences. Furthermore, the training “must be repeated over and over again to be certain that the tutors already have the skills and specialized knowledge.

CONCLUSIONS

The study revealed that the online learning and assessment has been approved and accepted by the students in our course (Forensic Medicine and Toxicology course). Satisfaction with Online Formative Quizzes, and the e-learning Learning process. Furthermore, our findings approved that our students have been satisfied with interaction of online sessions, and with its quality of online learning.

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تصور طلاب الطب للتعلم والتقييم عبر الإنترنت أثناء جائحة COVID-19: خبرة مصرية

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الملخص العربي

تسببت جائحة فيروس كورونا 2019 (كوفيد19) في اضطراب النظم التعليمية على مستوى جميع أرجاء العالم ، مما كان له تأثير واسع المدى على الطلاب وعلى سير العملية التعليمية حيث تم إغلاق المدارس والكليات والجامعات كإجراء احترازي بهدف منع انتشار الفيروس بصورة أشد. وبالتالي ، كان التحول إلى التعلم عن بعد هو الخيار الإلزامي الأفضل والوحيد في العديد من المؤسسات التعليمية على مستوى العالم بأسره.ولذا كان الهدف من هذه الدراسة هو قياس فعالية التعلم عن بعد والتقييم عبر الإنترنت والذي تم استخدامه في مقرر الطب الشرعي وعلم السموم أثناء جائحة كوفيد 19 من وجهة نظر طلاب السنة الخامسة من كلية الطب.

طريقة البحث: تم إجراء دراسة مقطعية عن طريق استبيان على طلاب السنة الخامسة بكلية الطب-جامعة قناة السويس في العام الدراسي (2020-2021) الذين مروا بتجربة التعلم عن بعد والتقييم عبر الإنترنت وقد كانت الاستجابة التي تم جمعها عبارة عن 99 طالب ، وهي نسبة كافية لتحليل العوامل،ومن خلال استخلاص العامل تبين أن عناصر الاستبيان التسعة عشر يمكن تصنيفها تحت خمسة عوامل تمثل 69.39% من التباين الكلي.

النتائج: كشفت نتائج الدراسة عن مدى التأثير الإيجابي للطلاب فيما يتعلق بالتعلم عبر الإنترنت ، وبالتالي الموافقة على نهج هذا التعلم الجديد. كما أثبتت الدراسة قيمة التعلم والتقييم عبر الإنترنت في وقت كارثة كوفيد 19. ولقد أظهرت النتائج مدى الرضا عن عملية التعلم الإلكتروني وجودة التعلم في الجلسات عبر الإنترنت. علاوة على ذلك ، الرضا عن التفاعل في الجلسات عبر الإنترنت. ولقد أظهرت النتائج أيضا أن التعلم المدمج (التعليم التقليدي والتعلم عن بعد سويا) هو الطريقة الأكثر تفضيلاً بشكل عام للسنوات القادمة من الدراسة (بعد جائحة COVID 19).

الخلاصة: كشفت الدراسة أن التعلم والتقييم عبر الإنترنت قد تمت الموافقة عليهما وقبولهما من قبل الطلاب في مقررنا الدراسي (مقرر الطب الشرعي وعلم السموم).