Egyptian Journal of Community Medicine, 2025;43(3):203 -210

Egyptian Journal of Community Medicine

Perception of Online Learning among Undergraduate Medical Students at Tanta University, Egypt

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Submission Date: 2024-11-18

Revision Date: 2024-12-24

Acceptance Date: 2024-12-25

Key Words: Online learning, medical, undergraduates, Egypt.

A B S T R A C T

Background: E-learning is an expanding educational methodology that provides students with the flexibility to learn at their own pace, selecting the most suitable time and location for their studies. This is especially significant in higher education, as students often must travel considerable distances to attend university. Objective: to describe medical undergraduates' opinions toward distance education at our university as regard class experience, student and lecturer engagement, online learning benefits and drawbacks, and student choice. Methods: Comparative cross-sectional research involving 1180 students (580 in group I and 600 in group II) from faculty of medicine, Tanta University. The research was done over a two-month period (April and May 2023). A self-administered structured questionnaire comprised sex, residence, academic year, and a question concerning students' experience with online education. Results: Nearly half of students in both groups participated effectively in 50-80% of online classes from home. Most students reported that the quality of interaction between students and lecturers was poor. Around fifty percent of the students in both groups identified cost and energy savings associated with traveling to and from the institution as benefits, whereas insufficient interaction with the lecturer was perceived as a drawback. Students in both groups choose traditional classroom learning over online learning. Conclusions: Our students noted that face-to-face learning is superior to online learning in developing knowledge, social competence, and clinical abilities. To ensure the effective execution of online learning, it is essential to formulate a carefully structured strategy and utilize innovative approaches to address anticipated barriers.

INTRODUCTION

The term "online learning" refers to the process of disseminating information using various digital platforms such as the World Wide Web, electronic mail, chat, teleconferencing, and video/audio conferencing. This strategy allows students to learn when and where it is most convenient for them. Planning and committing significant amounts of time and resources are usually necessary.[1] Because online distance learning allows for more convenient and effective contact and interaction between instructors and students, it has helped students and professors overcome some of the limits of traditional classroom education. Online learning offers significant instructional and financial advantages over face-to-face classes, including the ability to provide rapid feedback and educational support.[2] Online learning can be a helpful tool of learning for many educators because it provides an integrated set of educational

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experiences and resources and facilitates group discussions without requiring teachers and students to be in the same room or working at the same time.[3] Many modern online platforms offer helpful study areas for learners and professors who might find it challenging to meet in person. It makes students more likely to work on their own time management and planning skills in addition to their technical knowledge.[4] Also, has the ability to support educational programs at the institutional level that have been facing challenges in their on-campus counterparts due to factors such as increased numbers of students and financial constraints.[5]

Despite the efficacy of online learning, studies indicate that it cannot replace traditional face-to-face learning due to the absence of actual and real interaction between learners and instructors. Furthermore, there is a lack of training concerning the integration of online learning into the curriculum. Regrettably, educators and students encounter obstacles when applying technology. [6]

Online learning may be subject to several drawbacks. These include the requirement for consistent and sufficient financial backing, sufficient time, readiness of organizations and personnel, readiness of students, management of crises, opposition to change, technical assistance, synchronous and asynchronous classroom environments, late feedback, and evaluation as well as assessment.[7]

It has been proposed that only a small percentage of Egyptians are knowledgeable in the potential applications and benefits of education supported by information and communication technology (ICT), given Egypt's status as a developing nation and its recent adoption of e-learning.[8] Online education seems to be a practical and efficient answer to the widening gap between Egypt's current university enrollment and the expanding need for higher education, providing a prompt and affordable option. This doesn't mean that e-learning is just suitable for distance education programs, nor does it suggest that Egypt ought to ignore the importance of long-term investment in enhancing on-campus infrastructures through a systematic construction initiative. Employing e-learning methodologies in various formats can enhance the effective utilization of institutional resources and staff.[8] The study aimed to assess the attitude of medical undergraduates towards distance education at our university to evaluate their class experience, student and lecturer interaction, online learning benefits and drawbacks, and student preference.

Table 1: sociodemographic characters of participants

	Number	%
Sex:		
Male	522	44.2
Female	658	55.8
Residence:		
Urban	646	54.7
Rural	534	45.3
Academic Year:		
Basic medical year	580	49.2
Clinical medical year	600	50.8

METHODS

A cross-sectional study. The research was carried out in our university, Faculty of Medicine, between April and May 2023.

The total number of students in the study was 1180. By using a simple random technique, the first, second and third medical years were picked as a representation of basic medical years (group I=580) and the fourth and fifth years as a representative of clinical medical years (group II=600). The number of students was counted, and the questionnaire was delivered to them at random by selecting the fifth student from each list of names. Students were picked using a disproportionate probability stratified sampling procedure. The study's objectives were explained to the participating students and those who refused to participate were excluded.

Sample size and sampling: At a 95% confidence level and 5% precision, and with a power of 0.8 of the research, a minimum sample size of 400 students was predicted. The total sample size increased to 1180 students to be more accurate. EpiInfo was utilized to calculate the sample size. 98% of individuals responded.

Study tool: A self-administered structured questionnaire was used in this study. The questionnaire consisted of two parts; the first part included gender, residence, academic year, and questions about students' experience with online teaching before the COVID-19 pandemic. The second part was a structured questionnaire developed by Sindiani et al., 2020, the questionnaire consisted of 18

Table 2: Students' experience about online learning

	Number	%
How many online classes do you have in a week?		
1 class	50	4.2
2 classes	122	10.3
3 classes	224	19
4 classes	216	18.3
5 or more classes	568	48.2
Type of online classes		
Live Classes (synchronous)	56	4.7
Recorded Classes (asynchronous)	472	40
Both	652	55.3
Live Classes platforms used:		
Zoom	124	10.5
Microsoft teams	330	28
Zoom and Microsoft teams	234	19.8
Others	492	41.7
Asynchronous classes materials used:		
Slides	238	20.2
PDF files	282	23.9
Power Points	518	43.9
Recorded videos	534	45.3

questions were designed to assess four domains; The students' class experience, Students and lecturers' interaction, Advantages &disadvantages of online learning, Students' Preference of method of learning.[9] The questionnaire was valid and reliable (Cronbach's Alpha = 0.89).

Statistical analysis: The statistical package for social sciences (SPSS) (version 16.0, IBM, Armonk, NY) was used to analyze the study's data. A descriptive presentation was created for all study variables, and the Chi-s test was used to compare groups of basic and clinical medical years. The significance level was set at $p < 0.05$.

RESULTS

This study involved 1180 medical students, with 580 in the basic years and 600 in the clinical years. Females constituted 55.8%, while males represented 44.2%. Additionally, 54.7% of the represented students were from urban areas (Table 1).

Many students (48.1%) participated in five or more online lessons weekly. More than half of the students, 55.3%, participated in both live and recorded sessions, 40% participated only in recorded lessons, whilst approximately 4.7% attended only live classes. 28% of students selected Microsoft Teams as their preferred platform for live classes. Regarding asynchronous class materials, 45.3% of students utilized recorded videos, whereas 43.9% employed PowerPoint presentations (Table 2).

During online classes, nearly half of the included students in both groups (45.9% and 52.7%, respectively) were able to attend 50-80% of online classes at home, while less than one-third (30.3% and 22%, respectively) were able to attend less than 50% of online classes with significant difference between groups. A weak internet connection was the primary reason why 61.4% and 69% of students in both groups, respectively, did not attend online classes with significant difference between groups. Uncomfortable online learning and inappropriate timing were also factors. Messages on E-learning were used by 21% of students in group I and 37.7% of students in group II to communicate with lecturers during live classes. During lectures, 17.6% and 28.7% of students in groups I and II, respectively, engaged in direct interaction with the lecturer. However, in asynchronous classes, the predominant mode of communication between students and lecturers was through university email, as reported by 44.5% and 37.3% of students in both groups, respectively. The majority of students (71% and 52%, respectively) expressed that the student-lecturer interaction was of poor quality with significant difference between both groups. A smaller percentage (28.1% and 41.3%) considered the interaction to be good, while only 0.9% and 6.7% found it to be excellent. (Table 3).

A considerable proportion of students (51.4 and 52.3 %, respectively) stated cost and energy savings on transportation to and from university as advantages. This was followed by the ease of learning (29.3% and 42.7%, respectively) and the restricted negative effects of social interaction with significant difference between both groups. Among the students in Group I, the primary drawback identified by 53.7% was the absence of direct lecturer interaction. This was closely followed by 37.1% who expressed difficulty adapting to the online learning environment.

Table 3: Students and Lecturers' Interaction

	Group I (n=580)	Group II (n=600)	P-value
What is the percentage of your online classes that you were able to attend at home?			
Less than 50%	176 (30.3%)	132 (22%)	
50–80%	266 (45.9%)	316 (52.7%)	0.004*
More than 80%	138 (23.8%)	152 (25.3%)	
What are the causes that prevent the students from attending the online classes?			
Bad internet connection	356 (61.4%)	414 (69%)	0.006*
Inappropriate timing	124 (21.4%)	136 (22.7%)	0.643
Uncomfortable	130 (22.4%)	140 (23.3%)	0.711
Live attendance is not important	74 (12.8%)	82 (13.7%)	0.624
Students and Lecturers' Interaction during live classes through:			
Messages on E- learning	122 (21%)	226 (37.7%)	<0.001*
Learning discussion forum	48 (8.3%)	120 (20%)	<0.001*
Direct interaction during the lecture	102 (17.6%)	172 (28.7%)	<0.001*
Contact the lecturer via email	56 (9.7%)	72 (12%)	0.213
Students and Lecturers' Interaction for asynchronous classes through:			
E-learning massages	186 (32.1%)	208 (34.7%)	0.322
University E-mail	258 (44.5%)	224 (37.3%)	0.010*
Discussion forum on e-learning	80 (13.8%)	150 (25%)	<0.001*
Contact the lecturer via email	86 (14.8%)	140 (23.3%)	<0.001*
Student-lecturer interaction			
Bad	412 (71%)	312 (52%)	
Good	163 (28.1%)	248 (41.3%)	<0.001*
Excellent	5 (0.9%)	40 (6.7%)	

*Group I, students of basic medical years; group II, students of clinical medical years. *Significant with p<0.05*

A lack of technological resources was the most prevalent drawback in Group II (57.8%), followed by insufficient direct interaction with the lecturer (56.5%) with significant difference between both groups. (Table 4).

53.4% of Group I students and 74% of Group II students were against online learning over traditional classroom learning with significant difference between them. More than three-fifths of both groups (64% and 65.5%, respectively) did not wish to use online learning alone in the future. However, more than half of students (56.9% and 59.9%, respectively) in both groups planned to continue taking online learning classes alongside traditional learning classes in the future. When asked how to improve online learning, 54.7% of Group I students stated students needed better technological setup, 49% said lecturers needed better technical setup, and 42.2% said more dynamic and interactive sessions were needed. More technical equipment, more dynamic and interactive sessions, and more technical equipment in lectures were mentioned by students in Group II (67.3%, 62.3%, and 57.8%, respectively) with significant difference between both groups (Table 5).

DISCUSSION

Although e-learning is increasingly recognized for its advantages in countries like the United Kingdom, USA, and Australia, Egypt has not yet fully utilized this form of education. We looked at students' perspectives about important problems they had during their new learning experience, restrictions, faculty and staff performance, and overall satisfaction with this relatively new approach in Egypt.[8] The most popular live class platform utilized by students was Microsoft Teams, which was followed by Zoom and Microsoft Teams. Similar to this, a study conducted by Sindiani et al. in 2020 among Jordanian students found that Zoom was the most widely used platform for live classes at the time because it was the most widely used cloud meeting app.[9] Additionally, Al-Balas et al. found

Table 4: Advantages & Disadvantages of Online Learning

	Group I (n=580)	Group II (n=600)	P-value
Advantages of Online learning:			
Limited consequences of social contact	160 (27.6%)	252 (42%)	<0.001*
Saves money and energy from using transportation from and to university	298 (51.4%)	314 (52.3%)	0.744
An easier method of learning	170 (29.3%)	256 (42.7%)	<0.001*
Less absences than traditional teaching	86 (14.8%)	164 (27.3%)	<0.001*
Better interaction of students in classes	42 (7.2%)	96 (16%)	<0.001*
Better/higher academic achievement	48 (8.3%)	94 (15.7%)	<0.001*
Disadvantages of Online learning:			
Needs technical means	208 (35.9%)	347 (57.8%)	<0.001*
No direct contact with the lecturer	353(60.9%)	339 (56.5%)	0.141
No clinical access	212 (36.6%)	323 (53.8%)	<0.001*
Inability to provide a calm environment in the house while having the online class	110 (19%)	156 (26%)	0.004*
Worse/lower academic achievement	112 (19.3%)	122 (20.3%)	0.721
Cannot yet adapt with Online learning	215 (37.1%)	211 (35.2%)	0.533
More absences than in traditional teaching	68 (11.7%)	78 (13%)	0.546
Feeling online classes are not safe	72(12%)	72 (12.4%)	0.816

*Group I, students of basic medical years; group II, students of clinical medical years. *Significant with p<0.05*

that most students used more than one platform to learn, with 35.3% using Zoom as their only platform for educational meetings.[10, 11]

Considering the significant shift to distance education, it was necessary to investigate the impacts of online learning on medical students via different parameters. It is widely recognized that clinical classes necessitate direct interaction to get involved in clinical practice (physical examination, history taking, and clinical skills), whereas courses in basic science are better adaptable to online learning because they require minimal real-time interaction. It requires only a small amount of real-time contact between the professor and students. In our research, nearly half of students in both groups could attend 50-80% online courses from home. According to student feedback, inadequate internet connectivity, unsuitable online learning environments, and inconvenient scheduling are identified as factors limiting their participation in online courses. More than half of students in both groups in our survey thought the quality of the student-lecturer interaction was poor. Similarly, about 48.7% of clinical students and 57% of basic students described their interaction with the lecturer as poor.[12] According to Ni 2013, the social and communicative contact between instructor and student is a crucial aspect of education in the classroom.[13] Furthermore, more than 50% of students in Portugal and the UAE stated that they preferred face-to-face classes and want to spend whole studies in traditional classrooms, where interaction and fast response from professors and classmates are more useful.[14]

According to our research, the advantages of online learning included saving money and energy on transportation to and from university, as well as being a more convenient way of studying. Ibrahim et al, 2021 reported that 60% of Saudi medical students considered that e-learning is an adaptable and less time-consuming technique.[15] Similarly, the Jordanian survey found that the greatest benefit of e-learning was time savings, as expressed by 55.9% of students.[9] Additionally, a significant percentage of participants (72.1%), (78.8%), and (79.8%) in Subedi et al.'s 2020 study of nursing students in Nepal believed that attending classes online saves money on travel, allows them to take care of their families, and lowers their risk of accident.[16] Distance e-learning in medical education is difficult to implement, particularly in low- and middle-income nations.[10] There are three difficulties mentioned by the current study was a lack of direct interaction with the professor, followed by a lack of clinical access and a requirement for technical means. A prior study found that bad infrastructure, slow internet, and a lack of computer skills were some of the barriers to e- learning.[17]

Table 5: Students' preference for learning methods

	Group I (n=580)	Group II (n=600)	P-value
Do you prefer online learning method than classroom traditional learning?			
Yes	270 (46.6%)	156 (26%)	<0.001*
No	310 (53.4%)	444 (74%)	
Would you wish to keep using online learning alone in the future?			
Yes	209 (36%)	207 (34.5%)	0.621
No	371 (64%)	393 (65.5%)	
Would you wish to use online learning alongside traditional learning in the future?			
Yes	330 (56.9%)	359 (59.9%)	0.413
No	250 (43.1%)	241 (40.1%)	
What are the points that you think may improve online learning?			
For the lecturer to have a better technical setup	284 (49%)	347 (57.8%)	0.002*
For the student to have a better technical setup	317 (54.7%)	404 (67.3%)	<0.001*
Different classes timings	180 (31%)	212 (35.3%)	0.119
More dynamic and interactive classes	245 (42.2%)	374 (62.3%)	<0.001*
More private environment at student's house	88 (15.2%)	152 (25.3%)	<0.001*
Simpler ways of explanation and discussion during classes	178 (30.7%)	274 (45.7%)	<0.001*

*Group I, students of basic medical years; group II, students of clinical medical years. *Significant with p<0.05*

In a Saudi survey, 57% of respondents said that a bad internet connection was an obstacle.[15] Additionally, according to one-third of the students, the absence of basic knowledge of computers was a barrier, which is consistent with Gaikwad et al.[18] In accordance, Barteit et al. discovered that students perceived insufficient technical assistance from the e-learning platform.[19] Several technological limitations were identified by Fransen et al.[20]

In the current survey, a large proportion of students in both groups preferred classroom learning over online learning. Al-Balas found that just 26.8% of Jordanian medical students were satisfied with e-learning in 2020.[10] A recent cross-sectional study by Baloran in the Philippines found similar dissatisfaction toward the implemented Online-Blended Learning Approach, supported by our findings.[21] Elsayd et al. and Alsoufi et al., observed that, in the views of medical students, face-to-face learning was preferable to online learning, and they concluded that it is difficult to rely on online learning only due to the many difficulties experienced by both students and instructors.[22, 23.] In contrast, a study conducted by Portuguese academics Costa et al. discovered that e-learning was widely accepted.[24] Additionally, a study conducted in Pakistan by Abbasi et al. in 2020 found that 85% of students preferred this method of education.[25] Furthermore, Suryawanshi et al, 2020 found that 65.8% of Indian medical students prefer E-learning in their study.[26] The findings of studies performed by Raupach et al and Subramanian et al demonstrated that the adoption of online learning as opposed to traditional learning significantly improved students' learning. The main difference is because e-learning provides students with enhanced accessibility and efficiency to a wider variety and greater quantity of knowledge. Furthermore, it offers students greater control over educational materials, their education, and time management.[12, 27]

Moreover two-fifths of respondents think online learning needs better lecturer technology, simpler explanation and discussion methods, and alternative class schedules. Sindiani et al., 2020 found that most students agreed that the lecturer and students should have a better technological setup and that class time, participation, privacy, and easier ways to explain and discuss should be improved.[9] In a similar way, In the same way, Regmi and Jones's review of all the studies done from 1980 to 2019 showed that the main things that made online learning possible were motivation, contact, and easy access to technology.[28] A comprehensive analysis of ten studies found that

instructor's capacity to become more motivated and improve their e-learning skills are two things that make e-learning easier.[29]

In the present study, students in the clinical years (49.7%) preferred online learning over traditional learning methods, more than students in the basic years (45.9%) as they attend clinical training in college and theoretical lectures online. In the same way, a study from the School of Medicine and Dentistry in the United Kingdom discovered that second-year students agreed that e-learning improved their basic clinical skills. This is due to the use of blended learning in the UK.[19]

Conversely, Sindiani et al., 2020 discovered that approximately (75%) of students (Basic and Clinical) were disappointed with their online experience and don't intend to adopt it as an official teaching technique any time soon.[9] This is because that the clinical skill learning was difficult and could not be suitable for e-learning. Additionally, there was a lack of patient interaction as online learning cannot totally replace clinical learning, which involves observing real patients in a real-world setting.[30] This result is in line with previous recent studies evaluating students' attitudes toward online lectures.[31, 32]

CONCLUSIONS

Based on our findings, the convenience of learning from the comfort of one's own home is one significant benefit of online education. The main challenges were the technology and a lack of interaction with the lecturer. Our students preferred face-to-face learning over online learning in terms of increasing social skills. Effective adoption of online learning necessitates a well-structured plan and more creative strategies for overcoming apparent limits. Finally, we can say that e-learning is a viable addition to the educational process but should not replace it. Collaboration with telecommunications organizations is critical for delivering high-quality internet service at reasonable prices to both students and educators, as well as developing educators' skills in using technology in distant learning. The necessity for all medical colleges to provide a suitable educational platform is the best option for improving the quality of distance learning.

Ethical Considerations

After approval from our Faculty of Medicine's Research Ethics Committee, the study was carried out. Approval code "35863/9/23). The study's aims were explained to all students who participated in the study. The students who took part were assured of the confidentiality of their data. Before beginning with the study, participants who decided to participate provided written informed consent. All procedures were carried out in accordance with applicable rules and regulations.

Conflict of interest: The authors declared that there is no conflict of interest.

Funding: No funding was received for this work.

Acknowledgment: We are thankful for all the students that took part in our research.

Availability of data and materials: The datasets analyzed in this study are not publicly available due to data relating to the authors' associated university (Faculty of Medicine -our university) and to ensure the privacy of participants' information. However, data would be accessible upon an appropriate request from the corresponding author.

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Cite this article as: Walaa M. Shehata, et al. Perception of Online Learning among Undergraduate Medical Students at Tanta University, Egypt. *Egyptian Journal of Community Medicine*, 2025;43(3):203-210.

DOI: 10.21608/ejcm.2024.337563.1345