

Experiences of virtual teaching during COVID-19 in medical institutes of Karachi, Pakistan: teachers' perspective

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Abstract

Objective: To determine the experiences of faculty members related to virtual teaching.

Method: The cross-sectional study was conducted from January 15 to March 15, 2021, at undergraduate medical institutions located in Karachi, and comprised all the faculty members. Data was collected using a Google Survey questionnaire, and it was analysed using SPSS 20.

Results: Of the 385 subjects, 157(40.78%) were from basic sciences faculty, and 228(59.2%) were from the clinical sciences faculty. The majority had 3-5 years of teaching experience 142(37%). The most common online tool was Zoom 250(65%). The faculty who had prior experience or had received formal training for online teaching was more successful in controlling and engaging students than the rest ($p<0.001$). Those who had enough computer literacy had a better experience in conducting online teaching sessions ($p=0.01$). The experienced faculty found the opportunity to focus more on the topic that was to be taught online ($p<0.001$).

Conclusion: Most of the faculty members used online tool Zoom. Faculty members with computer literacy and proper training for online teaching were more successful in controlling and engaging students and conducting online teaching sessions.

Keywords: Virtual teaching, Zoom, Student engagement, Motivation, Computer literacy, Faculty development.

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Introduction

The ongoing coronavirus disease-2019 (COVID-19) pandemic has forced the world to change in many ways, and medical education is no exception.^{1,2} Teachers are left with the only choice of online delivery of content at a very short notice. The traditional, campus-based institutions moved their classes online. The faculty members who had little or no virtual teaching experience delivered their lectures through online learning platforms.³ This sudden transition from on-campus learning to exclusively distance learning during the pandemic posed a challenge for teaching faculty and medical educators. Teachers were expected to face various challenges, but many new opportunities opened up while experimenting with a relatively new teaching mode.⁴

The basic concept of online learning is not so new. However, with the advent of modern virtual technologies, it has shown remarkable restructuring from being asynchronous to almost complete synchronisation. But still this complete shifting of the entire delivery of content

online is new and challenging.⁵ Common e-learning activities include participating in online discussion, chat and other forms of conferencing, accessing specific e-learning content, taking tests and assessments, working through short exercises to stimulate thinking, or completing web forms, such as those used in e-portfolios or course evaluation.⁶ While some e-learning activities are direct analogue of offline activities, the majority activities, such as asynchronous communication, are significantly transformed by being in the online domain, and others, like interactive simulations and animation, are difficult to provide in any context other than a physical environment.⁷ Although medical teachers in the more developed countries are somewhat familiar with virtual education, facilitators in developing and underdeveloped countries are novice to online teaching. Most of them have no or very little experience of online teaching.⁸ The pandemic compelled them to adopt a style of teaching they were not accustomed to. Deploying new technologies usually introduces tensions, and e-learning is no exception. The novelty of e-teaching rendered the teachers, especially the traditional ones, facing new challenges and yet finding fresh opportunities.⁹

The current study was planned to determine the experiences of faculty members related to their virtual teaching.

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Subjects and Methods

This cross-sectional study was conducted from January 15 to March 15, 2021, at medical institutes of Dow University of Health Sciences (DUHS). After approval from the ethics review board of the Dow University of Health Sciences (DUHS), Karachi The sample size was calculated using OpenEpi¹⁰ version 3 by taking population size as unknown, frequency of the outcome factor 50%, confidence level 90% and margin of error 5%. More individuals than required were approached to account for possible non-response.

Sampling was done using non-probability consecutive sampling technique. Bachelor of Medicine, Bachelor of Surgery (MBBS) and Bachelor of Dental Surgery (BDS) clinical sciences and basic sciences teaching faculty members of DUHS who were involved in online teaching were included in this study.

The data was collected using Google Survey questionnaire which was designed with the help of themes experienced by academic staff during the initial period of teaching during lockdown.¹¹⁻¹⁴ The questionnaire was deliberately kept short to increase the response rate. The research team determined the content of the questionnaire. A small pilot study was also conducted to further validate the comprehension of the questions. After obtaining participant feedback, discrepancies were addressed, and long sentences were reworked to be simpler, clearer and more emphatic.

The questionnaires were sent to the participants through emails and other social media sources, like WhatsApp, and their responses were collected. It was mentioned in the email that filling up the form would be considered their consent to participate. Of the 13 questions, the initial five were about demographics, while the next eight focused on different aspects of virtual teaching and marking choices were: yes, no, maybe, somewhat, sometimes. Only two questions [about controlling (attentiveness and mental presence) and engaging (active interaction) students in virtual class] had to be marked on a 5-point Likert scale, from 1 = very unsuccessful to 5 = very successful. Questions were about the platform used for delivering online course (Zoom, Webinar Jam, Google Classroom, and Microsoft Team) and technical issues faced by the faculty. Additionally, there were questions regarding ability of the teachers to finish the session on time and students' willingness to attend the whole span of an online class. Independent variables were previous experience and training for online course, and computer literacy, while dependent variables were students' engagement and control during online lectures, motivation, focus on the

topic, freedom to work from anywhere, and others. The survey was anonymous, and information provided by the participants was kept strictly confidential. Any information that could lead to conflict or controversy towards any individual or institution was not disclosed.

Data was analysed using SPSS 20. The responses were expressed as frequencies and percentages. Chi-square and Fisher's exact tests were used to find out the relationship among dependent factors, like students' engagement and control during online lectures, motivation, focus on the topic, freedom to work from anywhere, and independent factors, like previous experience and training for online course, and computer literacy. $P \leq 0.05$ was considered statistically significant.

Results

Of the 385 subjects, 157(40.78%) were from basic sciences faculty, and 228(59.2%) were from the clinical sciences faculty. The majority had 3-5 years of teaching experience 142(37%). The most common online tool was Zoom 250(65%); 162(42%) subjects did not have any prior online teaching experience; 283(73%) had enough computer literacy; and 166(43%) had received formal training to deliver the course online (Table 1).

The faculty who had prior experience or had received

Table-1: General characteristics of the participants' (n=385).

Questions	n (%)
Teaching experience (years)	
0-2	74 (19)
3-5	143 (37)
6-10	110 (29)
> 10	58 (15)
Any experience with online teaching before	
Yes	120 (31)
No	163 (42)
Some	102 (27)
Field	
MBBS	308 (80)
BDS	77 (20)
Platform used for the delivery of online course	
Zoom	251 (65)
Webinar Jam	4 (1)
Google classroom	84 (22)
Microsoft team	46 (12)
Computer literacy to conduct an online class	
Yes	279 (73)
No	40 (10)
Some	66 (17)
Receive any training for the delivery of the course online	
Yes	166 (43)
No	117 (30)
Some	102 (27)

MBBS: Bachelor of Medicine, Bachelor of Surgery, BDS: Bachelor of dental surgery.

formal training for online teaching was more successful in controlling and engaging students than the rest ($p < 0.001$). Those who had enough computer literacy had a better experience in conducting online teaching sessions (Table 2). Motivated hosts were always able to start and finish their online sessions on time, and found the students willing to attend online classes ($p = 0.00$).

The experienced faculty found the opportunity to focus more on the topic that was to be taught online ($p < 0.001$). Also, experienced online teachers perceived online classes as freedom to work from anywhere ($p = 0.000$). Experienced online faculty members found this mode less intimidating than the non-experienced counterparts (Table 3).

Table-2: Relationship between being successful in controlling and engaging students and previous online teaching experience (n=385).

Questions		How successful were you in controlling students during real-time online classes?					How successful were you able to engage students during an online lecture?				
		*1	2	3	4	5	*1	2	3	4	5
		n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Were you given any training for the delivery of the course online?	Yes	0 (0)	0(0)	87(53)	63(37)	16(10)	4(2)	21(13)	69(42)	60(36)	12(7)
	No	4(3.5)	0(0)	39(33)	46(39)	28(24)	4(3.4)	16(14)	42(36)	43(37)	12(10)
	Some	4(4)	0(0)	36(35)	47(46)	15(15)	4(4)	4(4)	42(41)	40(39)	12(12)
	<i>p</i> -value			0.001				0.01			
Do you think you have enough computer literacy to conduct an online class?	Yes	4(1.5)	0(0)	92(33)	132(47)	51(18)	8(3)	11(4)	97(35)	131(47)	32(11.5)
	No	4(10)	0(0)	36(9)	0(0)	0(0)	4(1)	16(4)	20(5)	0(0)	0(0)
	Some	0(0)	0(0)	34(52)	24(36)	8(12)	0(0)	14(21)	36(55)	12(18)	4(6)
	<i>p</i> -value			0.01				< 0.001			
Do you have any experience with online teaching before?	Yes	0(0)	0(0)	35(29)	70(58)	15(12.5)	4(3)	17(14)	37(31)	50(42)	12(10)
	No	4(2.5)	0(0)	87(53.4)	52(32)	20(12)	4(2.5)	16(10)	68(42)	63(39)	12(7)
	Some	4(4)	0(0)	40(39)	34(33)	24(24)	4(4)	8(8)	48(47)	30(29.5)	12(12)
	<i>p</i> -value			< 0.01				0.019			

The Chi-square test and Fisher's exact test was used to find out relationship; *(with 1 being very unsuccessful, and 5 being very successful.); n=Number of participants, %=Percentage.

Table-3: Relationship between previous online teaching experience to other factors in online teaching (motivation, freedom to work from anywhere, focused teaching, controlled group communication, efforts and time for preparation and less intimidation) (n=385).

Variables		Do you have any experience with online teaching before?				<i>p</i> -value
		Yes	No	Some	Total	
		n (%)	n (%)	n (%)		
Did you feel motivated to host your online classes?	Yes	80 (30)	120(45)	66(25)	266	0.002
	No	3(20)	12(80)	0(0)	15	
	Sometimes	37(36)	31(30)	36(35)	104	
	Total	120(31)	163(42)	102(26)	385	
Do you think this mode of teaching gives you the freedom to work from anywhere?	Yes	85(30)	139(49)	58(21)	282	<0.001
	No	7(37)	0(0)	12(63)	19	
	Somewhat	28(33)	24(29)	32(38)	84	
	Total	120(31)	163(42)	102(26)	385	
Did this mode of teaching provide you the opportunity to focus more on the topic to be taught?	Yes	72(36)	84(42)	42(21)	198	0.001
	No	7(14)	19(38)	24(48)	50	
	Somewhat	41(30)	60(44)	36(26)	137	
	Total	120(31)	163(42)	102(26)	385	
Did this mode provide you an opportunity for better-controlled group communication during the question & answer or feedback session in an online class?	Yes	70(40)	80(45)	27(15)	177	<0.001
	No	19(26)	31(42)	24(32)	74	
	Somewhat	31(23)	52(39)	51(38)	134	
	Total	120(31)	163(42)	102(26)	385	
Did this mode of teaching take more of your effort and time to prepare a lecture?	Yes	49(23)	123(59)	38(18)	210	<0.001
	No	23(28)	24(29)	36(43)	83	
	Somewhat	48(52)	16(17)	28(30)	92	
	Total	120(31)	163(42)	102(26)	385	
Do you think this mode of teaching is less intimidating (easier to share thoughts with others)?	Yes	66(35)	83(44)	39(21)	188	0.08
	No	21(30)	24(35)	24(35)	69	
	Somewhat	33(26)	56(44)	39(30)	128	
	Total	120(31)	163(42)	102(26)	385	

Discussion

Previously, most medical institutions in the world, including Pakistan, relied upon classroom teaching, such as lectures, for preclinical medical students. But the COVID-19 pandemic provided medical educators with a unique opportunity to adopt innovative teaching. As a result of the pandemic, campus-based studies were suspended, and a rapid transition to virtual teaching occurred.¹⁵ The current study revealed several advantages and challenges of virtual teaching.

As everywhere else in the world,¹⁶ the majority in Pakistan were not ready for this unexpected transition to virtual from face-to-face teaching, with no planning and faculty training.⁹ Therefore, both the students and faculty faced many challenges while engaging in online medical education. It was noted that the young faculty with 3-5 years of teaching experience very well accepted this online mode of delivery compared to their seniors. This was because this generation is more social-media-savvy and uses social media as their primary source of communication.⁸ It was revealed that 65% of teachers chose Zoom for virtual teaching. Zoom is an easy video conferencing service that allows its users to communicate online within real-time via computer, tablet, or mobile device; many individuals use it because it requires lower bandwidth. Furthermore, Zoom also provides easy services like the recording of the online session and creating breakout rooms for group discussions. It also facilitates team-teaching by allowing more than one host and giving all of the hosts' administrative capabilities, such as sharing screens and remote control over shared screens.¹⁷⁻²⁰

Though most of the participants had enough computer literacy (73%), they had not received any formal training or had prior online teaching experience. Lack of training was found to be one of the biggest barriers faced by the educators. Literature suggests that inadequate training and skills and poor infrastructure can reduce facilitators' motivation and ability to engage students in teaching and learning.⁵ The current study showed that prior computer knowledge and experience or training in online teaching positively affected the online teaching experience. Faculty members who had prior experience or training were more motivated to take virtual classes, had better time management, and faced fewer technical issues. Moreover, they were more able to engage their students and did not take extra time to prepare a lecture. So, it is quite evident that effective online teaching and learning is related to faculty development. Professional development of faculty through faculty training programmes for the development of specific competencies, such as social competency, pedagogical competency, managerial competency and

technical competency, in the times of COVID-19 is now recognised as the need of the hour.^{5,20}

Besides, most of the study participants believed that this mode of teaching also allowed them to work from anywhere. This advantage is noted in several other studies.^{21,22} Faculty members who had prior experience of virtual teaching found the opportunity to focus more on the topic to be taught online and had better-controlled group communication during the question-answer or feedback session in an online class. Many participants found it less intimidating. This is in line with literature.²³ Moreover, the interaction in an online environment encourages wider student participation and produces more in-depth discussions than in a traditional classroom setting.²²

A systematic review found that in the developed countries virtual teaching for medical students is a praised teaching method, and web-based learning is thought to be as effective as traditional teaching. In contrast, developing countries negatively reported on the effectiveness of virtual teaching due to inadequate and poorly funded infrastructure and lack of training of teachers for a virtual environment.²⁴ This is also mirrored in the current study.

Virtual teaching for medical students enabled medical education to continue despite the effects of the pandemic.²⁵ The COVID-19 outbreak provided medical education faculty with the perfect opportunity to develop and further the application and effectiveness of virtual learning for medical students. Medical education faculty should embrace the transition to virtual teaching and continue to develop web-based materials, such as secure web-based assessments and resources with increased student interactivity, to ensure that the most effective and suitable teaching is delivered.²⁴ E-learning will undoubtedly have a significant impact on the environment in which future medical students will learn. Virtual teaching has the potential to provide better teaching. Therefore, virtual teaching would be an indispensable component of medical education in the near future.²⁶ In medical education, complete virtual teaching seems difficult because students need to perform practical course work and have to attend clinical rotations in the medical wards for clinical teaching. Therefore, it is suggested that medical institutions should adopt blended learning (BL). According to Saudi and Turkish surveys, medical students have a favourable perception of the BL environment.^{27,28} BL is better because inadequacies in one approach may be compensated for by the other.²⁹ When only one approach is used, the teaching becomes boring, and students lose interest and concentration within minutes, but combining several teaching and learning strategies promote

engagement with the topic, understanding and information retention.³⁰

A renowned education philosopher John Dewey once said, "If we teach today as we taught yesterday, we rob our children of tomorrow".³¹ So, it is inevitable to train the educators and equip them with contemporary and innovative teaching techniques if the idea is to enable them to become remarkable teachers of tomorrow.

The current study has limitations. It was a cross-sectional perception-based study that included faculty members of medical and dental institutions of Karachi. There was no exploration of the cause and effect. Moreover, the study only examined challenges of synchronous teaching, i.e., virtual teaching in which the learner and the instructor are present on the online format at the same time. Besides, the online forum was limited to imparting knowledge in the curriculum and did not cover clinical skills instruction. Further studies are required to look into the feasibility of teaching clinical skills in a virtual environment. Also, longitudinal studies should be conducted to determine the effect of faculty development programmes on the teaching skills of faculty members.

Conclusion

The most used online tool was Zoom, and almost half of the respondents did not have prior online teaching experience and had not received any formal training to deliver the course online. Faculty members with computer literacy and formal training for online teaching were more successful in controlling and engaging students and conducting online teaching sessions.

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