Faculty experience regarding the effectiveness and issues of Web-based teaching and learning during COVID-19 pandemic: A Cross-sectional descriptive study

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ABSTRACT

Objective: To assess the faculty experience regarding the effectiveness and issues of web-based teaching and learning during Covid-19 pandemic

Study Design: Cross sectional descriptive study

Place and Duration: Anatomy Department, Bahria University Medical and Dental College, from 30th June 2020 to 20th July 2020.

Methodology: A total of 93 faculty members was recruited by non-probability convenience sampling. A questionnaire with six domains having 27 close ended questions was designed on Google Form and its link was shared to the faculty of medical, dental, physiotherapy, medical lab technology departments through E-mail, WhatsApp and text messages. Each question was judged on the basis of 5–point Likert scale.

Results: The faculty showed dissatisfaction regarding the training conducted prior to the online sessions. Highly significant results were obtained in terms of anxiousness felt by teaching staff before the commencement of the sessions (p=0.000). Teachers reported that controlling web-based classes was difficult. Most of faculty did not find difficulty in hearing students' voice during the session (0.017). Maintaining students' attendance was regarded as a problem with significant results (p=0.038). The faculty regarded college sessions better than the online ones (p=0.003). Most of the faculty agreed that with time sessions became easy to handle.

Conclusion: The present study showed that faculty faced various issues during the web-based teaching sessions. Other than the network connectivity problems, lack of teachers' knowledge regarding software use is among the issues which need to be addressed. Though faculty had reservations to the new teaching method, with the passage of time, the faculty has adapted fairly well to the new system.

Keywords: Faculty, Experience, Effectiveness, Web based, Teaching, Learning, Covid-19, Pandemic

INTRODUCTION

Covid-19 pandemic has led to evolvement of diverse way of teaching strategies so that routine life continues[1]. The lock down in various countries has led to evolvement of new dimensions of teaching that includes e-teaching though different softwares[1,2].

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An online survey of higher education students studying in Pakistan has revealed that the academic activity continued as it was prior to outbreak, the only difference remaining was that the teaching was being done using internet resources[3]. Effective online teaching is based on several factors. The engagement of students during the sessions is a cornerstone for better understanding of the online classes[4]. As the new education method does not involve commute that is why students can learn and interact with their teachers in the comfort zone of their homes[5]. According to a recent research, as the internet-based teaching is new for all that is the reason why there is a need to address various issues including innovation in teaching methodologies, faculty training, involvement of IT persons, etc[6]. The transition from face to face to online teaching process is not an easy endeavor. A recent research has reported that 42.5% of the faculty regarded online teaching as very difficult and 34% declared it as difficult[7]. A study based on semi-structured interviews with teachers on Skype has documented that faculty has found several issues while taking web-based classes. Along with the connectivity issues, many had little awareness regarding the setup and facilitation of sessions through online platform[8]. A research has documented that online classes on a large scale has caused load on the computer services leading to

connectivity issues[9]. Internet connectivity is one of the major issues faced by both the teachers and the students[10]. From time to time feedback is essential for keeping a track about learning and efficiency of online teaching methods[11]. The competency in the web-based learning is not a choice but rather a need of the day as it is the requirement of the changing times[12] therefore training related to the technological aspects of online teaching is a must[13].

In Pakistan, Higher Education Commission has asked the medical universities from campus training to continue academics through online classes but no roadmap or guidelines were given regarding the conveyance of online classes.[1] There are many researches based on the students 'experience regarding the online teaching but few studies exist pertaining to the experience of faculty members regarding the novel teaching method. As teachers' role is imperative in imparting education and curriculum designing, therefore, the present study was planned to determine the faculty experience regarding the effectiveness and issues of web-based teaching and learning. The study could be a useful tool in identifying and filling the gaps which the teachers face during web-based facilitation and to provide a basis to mold the pattern of imparting education according to the present day needs. So, this study was conducted with an objective to assess the faculty experience regarding the effectiveness and issues of web-based teaching and learning during Covid-19 pandemic.

METHODOLOGY

This descriptive cross-sectional study was conducted at Department of Anatomy, Bahria University Medical and Dental College, Karachi from 30th June 2020 to 20th July 2020. The participants of the research were recruited by non-probability convenience sampling. Inclusion criteria were to include all the faculty members who took part regularly in web-based teaching sessions. Faculty members who were on leave during internet teaching sessions were excluded from the research. A questionnaire with six domains having 27 close ended questions was created through literature review and content was validated by a team of medical educationalists. Pilot testing was done on some of the faculty to observe their understanding. Each question was judged on the basis of 5–point Likert scale (strongly agree, agree, neutral, disagree and strongly disagree). The assessed domains were Personal experience, Difficulties faced, Class control, Teaching strategies, Question answer sessions and Facilitation of student learning. Questionnaire was designed on Google Form and its link was shared to the lecturers, assistant professors, associate professors and professors of medical, dental, department of physiotherapy (DPT) and medical lab technology (MLT) departments through E-mail, WhatsApp and text messages. The respondents data was saved in the personalized Google account of the principal investigator in the form of Microsoft Excel file. The bias in the data was addressed by keeping the questionnaire anonymous without names.

Data Analysis: SPSS version 23 was used to analyse data. Chi-square test was used to see significance between effectiveness

and issues of internet teaching and responses of faculty members. The data was presented in form of frequency (n) and percentages (%). P-value of ≤0.05 was considered as significant at 95% confidence interval.

RESULTS

A total of 93 faculty members participated in the research. Out of the total, 64 faculty members were from medical college, 22 from dental college, 4 from DPT and 3 from MLT.

Majority of the faculty members felt that through online teaching, new ways of teaching were learnt. Most of the faculty disagreed that online sessions were better than the on-campus teaching. (Table-I). A mixed response was obtained regarding the satisfaction level felt by the faculty for the training conducted before the online classes. Variable response was also recorded for the statement regarding internet teaching being a great experience (Figure-1).

Table-I: Personal experience of faculty members (N=93)

Questions	Likert's scale	Designation				
		Lecturer	Assistant Professor	Associate Professor	Professor	p-value
Anxiousness before taking the sessions was felt	Strongly disagree	2 (2.8%)	0 (0.0%)	0 (0.0%)	1 (6.3%)	0.000**
	Disagree	14 (19.4%)	0 (0.0%)	0 (0.0%)	5 (31.3%)	
	Neutral	18 (25.0%)	0 (0.0%)	0 (0.0%)	1 (6.3%)	
	Agree	36 (50.0%)	0 (0.0%)	1 (50.0%)	6 (37.5%)	
	Strongly agree	2 (2.8%)	3 (100.0%)	1 (50.0%)	3 (18.8%)	
Internet sessions are better than college teaching	Strongly disagree	13 (18.1%)	0 (0.0%)	0 (0.0%)	7 (43.8%)	0.003**
	Disagree	34 (47.2%)	2 (66.7%)	1 (50.0%)	6 (37.5%)	
	Neutral	21 (29.2%)	1 (33.3%)	0 (0.0%)	3 (18.8%)	
	Agree	3 (4.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
	Strongly agree	1 (1.4%)	0 (0.0%)	1 (50.0%)	0 (0.0%)	

Significant result – p value ≤ 0.05 *
Highly significant result – p value ≤ 0.001 **

Maintaining students' attendance was regarded as a problem with significant results (Table-II). Internet connectivity related issues were faced by 66.6% lecturers, 50% of the associate professors and 56.3% of the professors. When the faculty was asked whether their interaction with students was satisfactory, to this statement 40.3% lecturers, 66.6% assistant professors, 50% associate professors and 50.1% professors agreed. In responses to the statements whether some or most of the students were out of control during the class, majority of the teachers disagreed. Among the faculty, 38.9% lecturers and 25% of the professors agreed that the surrounding sounds were disturbing.

Variable feedback responses were received when faculty was asked about difficulty in controlling the class during the internet teaching (Table-III). Most of the faculty agreed that with time sessions became easy to handle.

Table-II: Difficulties faced during the online sessions (N=93)

Questions	Likert's scale	Designation				p-value
		Lecturer	Assistant Professor	Associate Professor	Professor	
Interaction with the students was satisfactory	Strongly disagree	6 (8.3%)	0 (0.0%)	0 (0.0%)	2 (12.5%)	0.193
	Disagree	21 (29.2%)	1 (33.3%)	1 (50.0%)	4 (25.0%)	
	Neutral	16 (22.2%)	0 (0.0%)	0 (0.0%)	2 (12.5%)	
	Agree	27 (37.5%)	1 (33.3%)	0 (0.0%)	5 (31.3%)	
	Strongly agree	2 (2.8%)	1 (33.3%)	1 (50.0%)	3 (18.8%)	
In most of the sessions students could not hear facilitator's voice	Strongly disagree	9 (12.5%)	1 (33.3%)	1 (50.0%)	3 (18.8%)	0.215
	Disagree	49 (68.1%)	1 (33.3%)	1 (50.0%)	8 (50.0%)	
	Neutral	10 (13.9%)	1 (33.3%)	0 (0.0%)	1 (6.3%)	
	Agree	4 (5.6%)	0 (0.0%)	0 (0.0%)	4 (25.0%)	
	Strongly agree	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
In most of the sessions it was difficult to hear students voices	Strongly disagree	8 (11.1%)	1 (33.3%)	2 (100.0%)	3 (18.8%)	0.017*
	Disagree	37 (51.4%)	1 (33.3%)	0 (0.0%)	7 (43.8%)	
	Neutral	15 (20.8%)	0 (0.0%0	0 (0.0%)	2 (12.5%)	
	Agree	12 (16.7%0	1 (33.3%)	0 (0.0%)	2 (12.5%)	
	Strongly agree	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (12.5%0	
Record maintaining of attendance was a problem	Strongly disagree	2 (2.8%)	0 (0.0%)	1 (50.0%)	0 (0.0%)	0.038*
	Disagree	26 (36.1%)	2 (66.7%)	0 (0.0%)	7 (43.8%)	
	Neutral	7 (9.7%)	0 (0.0%)	1 (50.0%)	1 (6.3%)	
	Agree	24 (33.3%)	1 (33.3%)	0 (0.0%)	4 (25.0%)	
	Strongly agree	13 (18.1%)	0 (0.0%)	0 (0.0%)	4 (25.0%)	

Significant result – p value ≤ 0.05 *
Highly significant result – p value ≤ 0.001 **

Table-III: Class control during the online sessions (N=93)

Questions	Likert's scale	Designation				p-value
		Lecturer	Assistant Professor	Associate Professor	Professor	
It was difficult to control the class	Strongly disagree	9 (12.5%)	1 (33.3%)	0 (0.0%)	2 (12.5%)	0.254
	Disagree	36 (50.0%)	1 (33.3%)	1 (50.0%)	9 (56.3%)	
	Neutral	14 (19.4%)	0 (0.0%)	0 (0.0%)	3 (18.8%)	
	Agree	10 (13.9%)	1 (33.3%)	1 (50.0%)	2 (12.5%)	
	Strongly agree	3 (4.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	

Significant result – p value ≤ 0.05 *
Highly significant result – p value ≤ 0.001 **

When the faculty was asked about using PowerPoint as the only tool during the sessions, variable response was received. In response to the statement regarding the whiteboard as being the only tool, majority of the faculty members disagreed. The response was mixed when it was asked whether both PowerPoint and white board were used (Table-IV). Regarding the use of videos display for enhancement of learning, 48.6% lecturers, 50% associate professors and 62.5% professors agreed while 66.7% assistant professors disagreed.

Table-IV: Teaching strategies and facilitation of students learning by the faculty during wed-based teaching (N=93)

Questions	Likert's scale	Designation				p-value
		Lecturer	Assistant Professor	Associate Professor	Professor	
The only tool used in the session was Power point	Strongly disagree	3 (4.2%)	0 (0.0%)	1 (50.0%)	1 (6.3%)	0.340
	Disagree	18 (25.0%)	0 (0.0%)	0 (0.0%)	6 (37.5%)	
	Neutral	10 (13.9%)	0 (0.0%)	0 (0.0%)	1 (6.3%)	
	Agree	32 (44.4%)	2 (66.7%)	1 (50.0%)	7 (43.8%)	
	Strongly agree	9 (12.5%)	1 (33.3%)	0 (0.0%)	1 (6.3%)	
The only tool used in the session was white board	Strongly disagree	51 (70.8%)	2 (66.7%)	1 (50.0%)	8 (50.0%)	0.814
	Disagree	7 (9.7%)	1 (33.3%)	0 (0.0%)	3 (18.8%)	
	Neutral	2 (2.8%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
	Agree	1 (1.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
	Strongly agree	4 (5.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Both Power point and white board were used	Strongly disagree	4 (5.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.663
	Disagree	15 (20.8%)	1 (33.3%)	0 (0.0%)	4 (25.0%)	
	Neutral	23 (31.9%)	2 (66.7%)	1 (50.0%)	4 (25.0%)	
	Agree	27 (37.5%)	0 (0.0%)	1 (50.0%)	5 (31.3%)	
	Strongly agree	3 (4.2%)	0 (0.0%)	0 (0.0%)	3 (18.8%)	
Question Answer Session						
Questions asked by the students were answered during the given time	Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (6.3%)	0.416
	Disagree	4 (5.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
	Neutral	4 (5.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
	Agree	52 (72.2%)	3 (100%)	1 (50.0%)	9 (56.3%)	
	Strongly agree	12 (16.7%0	0 (0.0%)	1 (50.0%)	6 (37.5%)	
Facilitation of student learning						
Materials (e.g. Power Point Presentations, notes etc.) used were uploaded for students	Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.073
	Disagree	1(1.4%)	1 (33.3%)	0 (0.0%)	1 (6.3%)	
	Neutral	5 (6.9%)	0 (0.0%)	0 (0.0%)	2 (12.5%)	
	Agree	38 (52.8%)	0 (0.0%)	0 (0.0%)	7 (43.8%)	
	Strongly agree	28 (38.9%)	2 (66.7%)	2 (100.0%)	6 (37.5%)	

Table-IV shows the response of faculty regarding their policy of allowing students to ask questions during the online session. Majority of the faculty members agreed when asked about allowing the students to ask questions at the end of the sessions. In response to whether email address was given to students to ask questions, a mixed response was received (Figure-1).
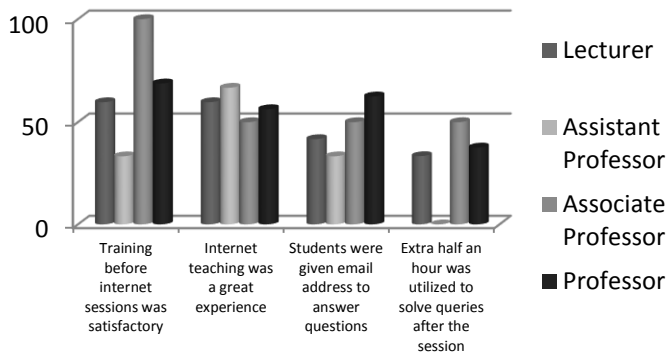
Figure-1: Faculty experience of online learning (Agree N=93)

A mixed response was recorded regarding extra half an hour being utilized in solving queries after the session (Figure-1). Table IV shows the strategies adopted by the faculty to facilitate students learning. Variable response was documented for the statement regarding the recording of lectures for the students (Figure-2).
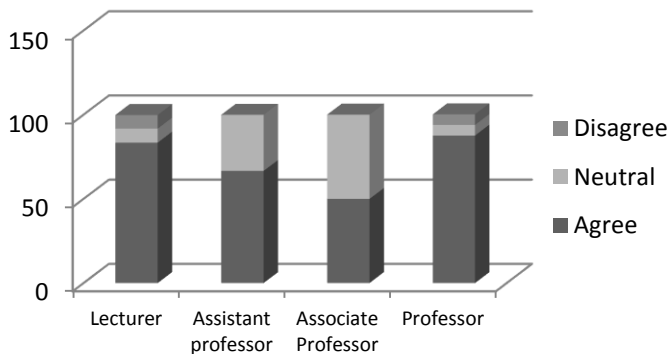

Figure-2: Recorded lectures for students (N=93)

DISCUSSION

Personal experiences of the faculty play a pivotal role in identifying the merits and the demerits of any teaching tool. The learning of digital teaching methods is associated with betterment of teachers' competencies[14]. The current study showed that training before the online sessions was considered as satisfactory. Parallel results in terms of satisfaction regarding the institutional training prior to online teaching were mentioned in a recent research which showed that 60% of the faculty members were satisfied by the provision of workshops conducted at the institute[15] while another study showed contradictory results stating that teachers complained that they were not trained for the new methodology of facilitation[13]. The current study suggested that faculty members experienced anxiety before the commencement of the sessions. Analogous results were documented stating involvement of 36.6% and 33.8% of faculty at educational institutes of Pakistan and Pakistan respectively[15,16]. The present study showed that faculty members seemed uncomfortable with the new method of teaching. Analogous results were documented by teachers working at King Edward Medical College[13]. Parallel results were

also documented by surveys conducted at different regions around the globe[17,18]. In contrast to our findings, a study stated that faculty showed acceptance towards e-learning during the lockdown period[19]. Another research has showed that learning is negatively affected as lack of human interaction is a feature of online teaching[20]. Gazza reported teachers considered online teaching as more time consuming than the conventional classroom system[21]. The present study showed that majority of the faculty disagreed that online teaching is better than on campus teaching. Parallel results were documented in a research study stating that 81.2% of the faculty disagreed that online teaching can replace face to face conventional method of teaching[15]. Alqurshi in the research has mentioned that the teachers found it difficult to teach complicated scientific concepts through online sessions[20]. The reason for being uncomfortable with online methodology could be because it is new to all and involves technology.

There are technical aspects associated with web-based teaching. The present study showed that the staff members at BUMDC faced internet connectivity issues. Parallel findings were reported by a research which stated that 56.3% of the staff members faced network issues[15]. Hassan and colleagues also documented that 73.5% teachers had to face technical problems while preparing and creating e-content. According to the faculty 91.7% had to face connectivity issues and difficulty in conducting session with low bandwith[7] A study conducted at Saudi Arabia has revealed that more than thirty percent of the teachers complained about internet connectivity problems.[20] Junior faculty members in the present study seemed to be dissatisfied with the interaction between the facilitators and the students. Parallel results were documented by an online survey conducted in Bangalore[16]. Marshall and colleagues has mentioned analogous findings stating that in online teaching, students' teachers' interaction is lacking and that hampers learning[22]. Other studies conducted at India and Indonesia have reported that personal interaction of the teachers lacks during the online sessions[23,24]. The results of the current study show that faculty experience nuisance in the form of disturbing surrounding voices. A study mentioned results in concordance to our findings stating that when more than one student speaks during session, the voices become mixed and it's difficult to hear clearly[24]. Our study findings state that majority of the faculty members record lectures to facilitate students learning. A study conducted in Indonesia has revealed that recorded lectures play an essential role in students' learning as they can access them any time they want as compared to live lectures which are dependent on internet connectivity at the specific time[24]. The present study showed that teachers found difficulty in the taking the attendance and keeping its record. Other researches also documented similar findings[10,24]. The connectivity issues along with lack of effective interaction are among the major reason that hamper effective teaching and facilitation.

In order to have effective teaching and learning environment both class control play a vital role. The current study demonstrated that overall teachers were satisfied by class control. Contrary to our results, a study conducted in India has mentioned that 76.4% of the teachers consider that it was

difficult to control group interaction during the class[16]. With the passage of time faculty adapted with the new teaching system and were at ease. Analogous findings were mentioned in a research based on an online survey as 66.4% of the faculty members documented that they were more comfortable than before after a period of seven weeks[17]. A study conducted in Islamabad, Pakistan has revealed that 58.8% of the staff members think that internet teaching method is associated with convenience and 65.6% stated that the new methodology of teaching was acceptable to them[14]. As with every new system, faculty initially found difficulties and later they were adjusted.

The web-based teaching lacks face to face interaction therefore teachers have to adopt certain facilitation styles that can aid distant learning. In the present study majority of the senior faculty (professors) shared videos with the students. A case study conducted in Indonesia also documented the effectiveness of showing videos in the sessions[25]. The current study showed that majority of the members used PowerPoint while some of the faculty also employed the use of white board during their sessions. A case study mentioned parallel similar results in terms of white board usage as only 15.5% of the faculty interacted through whiteboard[17]. The adoption of new teaching tools is essential for learning and understanding but as teachers are new to the system they do not fully know how to use different options in the soft wares like white board.

A very important aspect of learning involves questions asked by students to clear their concepts. In the present study, most of senior faculty members gave email addresses to the students to answer their questions. A research conducted in Peking University also endorsed that students should be provided with email addresses so that they can approach the faculty for any further feedback and queries[25]. It is a need of the time that our faculty be fully prepared to new teaching tools and environment so they can facilitate learning at their best. Adaptability to a newer system requires vigorous training and also involves use of resources.

Recommendations: On the basis of the results of present study following recommendations can be made

1. The new online soft wares have features that help keep the record of those who have attended the session. Faculty should be trained as to how to use the feature.
2. Those faculty who do not have sufficient internet bandwidth at their residence should be given facilities to conduct classes from campus or given a choice to record classes and the sessions later be uploaded by the institute.
3. The institutes who are better equipped with IT facilities and trained faculty members should be sharing their experience with those who are less developed in this field. The technological training in the present days circumstances is a must and no more a choice.
4. There is a need to conduct survey at both public and private colleges so that results of the study can be generalized.
5. The online teaching method is new to our system and therefore there is a need to conduct longitudinal studies in future to document effectiveness and associated issues in a better manner.

CONCLUSION

The present study showed that faculty faced various issues during the web-based teaching sessions. Other than the network connectivity problems, lack of teachers' knowledge regarding software use is among the issues which need to be addressed. Though faculty had reservations to the new teaching method, however, with the passage of time, the faculty has adapted fairly well to the new system.

AUTHOR'S CONTRIBUTION

Javaid Q: Conceived idea, Designed study, Data Analysis, Data interpretation, Manuscript writing, Final proofreading
Usmani A: Designed study, Data interpretation, Manuscript writing

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