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Self-reflection and perception of medical and allied courses faculty to online teaching compared to traditional teaching: A mixed-method study

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ABSTRACT

Objectives: Most teachers have minimal experience with online teaching since most of their learning and teaching years have been spent in a traditional face-to-face classroom. So how do instructors prepare themselves to teach online? What are their expectations of this new learning environment for the first time? The nature of faculty preparation and duration of experience affecting the performance between faculty will vary considerably, and support provided for online teaching also vary over a period of time. The objectives of this study were to obtain/collect the perception of medical and allied course faculty employed at Deemed to be University, Pondicherry, to online teaching compared to traditional teaching.

Materials and Methods: The online questionnaire and informed consent were mailed to all the faculty, and they were instructed to rate on a five-point numerically coded Likert scale (Always = 5, Frequently = 4, Sometimes = 3, Seldom = 2 and Never = 1) their satisfaction level to an online lecture class. Preliminary details, such as name, age, gender, department, college and post P.G experience, were obtained. Based on the scoring, inferential analysis was done. The online discussion session was done amongst selective participants, and a thematic analysis of the same was done.

Results: A total of 119 participants responded to the questionnaire. An unpaired *t*-test was applied, and a significant difference ($P \leq 0.05$) was observed in the 17 questions in the study population between online and traditional lectures.

Conclusion: Faculty were overall not satisfied with online lecture classes as they had trouble providing set induction and adequate closure, enabling pupil participation during lecture presentation and time management compared to traditional/conventional lecture classes. Faculty feel that online teaching can continue in the post-pandemic era for a few selectively chosen appropriate topics, and the class duration should be short. A blended approach to learning can be adopted in the future.

Keywords: Online teaching, Faculty, Perception, Online discussion session

INTRODUCTION

E-learning has become an integral or essential part of modern education worldwide. Considering the current COVID-19 (Coronavirus) pandemic situation, e-learning has gained more popularity and has become an inevitable method to ensure the continuity of classes. In the first quarter of

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the current academic year (2020), classroom teaching was the primary or predominant teaching–learning method for large-group teaching. The sudden need for an alternative teaching method has created an avenue and compelled to introduce full-fledged online teaching in the medical curriculum.

Most teachers have minimal experience with online teaching since most of their learning and teaching years have been spent in a traditional face-to-face classroom.[1] So, how do instructors prepare themselves to teach online? What new teaching strategies will be adopted for this mode of teaching?[2] The teaching strategy in terms of the nature of faculty preparation, duration of experience and support provided for online teaching affecting the performance between faculty will vary considerably over a period of time.[3,4]

The present study is unique in that it is planned to look at the self-reflection he several 1-time online teachers/faculty on their satisfaction level with online teaching compared to conventional classroom teaching through a mixed-method approach.

MATERIALS AND METHODS

Study design and setting

This was a cross-sectional descriptive study along with Online discussion session (ODS), done amongst teaching faculty involved in the online teaching of undergraduates (medicine, dental and paramedical courses) of a deemed to be university, Pondicherry, after the onset of the COVID-19 pandemic. Based on the results obtained from the quantitative study, purposive sampling was done for ODS.

Sampling size and method

The study was planned as a continuous comparative response variable for matched modalities of teaching (online versus conventional) from a single group of study participants. With an assumption that the difference in the response of matched modalities of teaching to be 10% and normally distributed with a standard deviation of 30%, the sample size was estimated to be 97 participants so as to enable us to reject the null hypothesis that this response difference is zero with probability (power) of 0.9. The Type I error probability associated with this test of this null hypothesis is 0.05.

Questionnaire

The self-reflection satisfaction tool is a self-administered structured questionnaire. This questionnaire was checked for face validity and content validity before implementing in the study. It was used to collect the satisfaction level of faculty of their first-time online teaching experiences. This self-reflection tool has statements on elements of roles of an instructor taken up during a lecture like the introduction of the topic, presentation of content, pupil participation, time management, summary and adequate closure.

After obtaining informed consent, faculty were instructed to rate their satisfaction level to an online lecture class on a five-point numerically coded Likert scale (Always = 5, Frequently = 4, Sometimes = 3, Seldom = 2 and Never = 1). Preliminary or demographic details, such as name, age, gender, department, college and teaching experience following post-graduation, were obtained. Based on the scoring, inferential analysis was performed.

Method of data collection

The self-reflection satisfaction tool and informed consent were mailed to the teaching faculty. Faculty are instructed to rate on a five-point numerically coded Likert scale. In an online survey, since the general response rate is around 30%, we sent the survey link to 384 participants, and we received a response from 119 participants.[5]

ODS via Zoom platform

Design

Purposive sampling was sought amongst participants teaching online classes. The participants were recruited via an email invitation to participate in a Zoom interaction. ODS consisted of a moderator, a scribe, and six participants who represented pre-clinical and clinical departments.

A semi-structured interview format was utilised to guide the discussions, along with the moderator, who facilitated the discussion.[6] The interview began with an ice-braking session to allow participants to introduce themselves, which included their current title, designation, years of experience in undergraduate teaching and an online environment. In the Online discussion group, participants responded to the following questions:

- Self-reflection on advantages, disadvantages, scope and future of online teaching
- Do you think online teaching of theory topics should continue post-pandemic?
- Do you think topics and learning objectives to be modified for an online class?
- Do you think online teaching requires more effort from the faculty to facilitate engagement amongst learners?
- Do you think online teaching works better in small-group settings?
- Do you think online teaching is more appropriate for postgraduates when compared to undergraduates?
- Do you think it is necessary to be trained to take an online class during post-graduation?

Before ending each Online discussion group session, the moderator and the scribe summarised the main points of the discussion and asked participants if they had any questions, clarifications, or additional comments they would like to share. The session lasted 70 min and was recorded for future reference.

Statistical analysis

The responses were entered in the Microsoft Excel sheets. The statistical analysis was carried out using the Statistical Package for the Social Sciences version 20, IBM Corp, Chicago, IL, USA. Descriptive statistics about the socio-demographic status and responses were represented as frequency and proportions. The difference amongst groups was tested using the Chi-square test for independent variables, and $P < 0.05$ was considered statistically significant. Thematic analysis of the ODS was done.

Ethical considerations

The study was reviewed by the Institutional Ethics Committee and approved (IEC approval number MGMCRI/IRC/04/2020/46/IHEC/172). All the data were collected in an anonymised manner.

RESULTS

A total of 119 responses were collected from the filled questionnaire amongst the faculty. There were 58 male and 61 female responders. There was no significant difference between the gender of the participants and their perception of online teaching compared to the traditional method. The average age of the faculty was 32 years (42.8%) from the range of 30–70 years. The majority of responders had 3–5 years (42%) of undergraduate teaching experience, followed by 6–10 years (35.3%) of experience [Table 1]. There was a minimal negative correlation coefficient of 0.01 between the years of teaching experience and the mean difference in scores between the traditional and online classes, but it was not statistically significant.

The maximum response was obtained from the medical faculty (60 out of 119) compared to dental and pharmacy. Mean and standard deviation was calculated for each response for all the 17 questions of the questionnaire and are depicted in [Table 2]. A $P \leq 0.05$ was considered statistically significant. There was no significant difference in mean difference between people who had prior experience in online teaching or not.

Three open-ended questions regarding the advantages and disadvantages of online teachings and faculty preparation for online teachings were asked, and common responses were identified and utilised for ODS preparation.

Table 1: Frequencies of socio-demographic characters of the participants.

Variable	Category	Frequency *n* (%)
Age	25–35	68 (57.1)
	36–45	37 (31.8)
	46–55	10 (5.9)
	56–65	3 (2.5)
	66 and above	1 (0.8)
Gender	Female	61 (51.3)
	Male	58 (48.7)
Designation	Tutor/Demonstrator/Senior Resident	12 (10.1)
	Assistant professor	5 (4.2)
	Associate professor	37 (31.1)
	Professor	28 (23.5)
		37 (31.1)
Undergraduate teaching experience (In yrs)	0–5	50 (42)
	6–10	42 (35.3)
	11–20	21 (17.6)
	>20	6 (5)
Prior experience with online teaching	Yes	39 (32.8)
	No	80 (67.2)

n: Number of participants (119)

Qualitative analysis of ODS on online teaching

A ODS was adopted after a post-quantitative survey to generate discussion/debate on the research topic as it was needed to obtain collective views and detect the meanings behind those opinions.[7] Hence, to gather informative data in our ODS, we focussed on recruiting study participants based on their experiences and willingness to engage in a discussion to explore experiences related to online teaching. We designed to conduct an ODS in multiple sessions, but during the execution of the first session, all the participants shared enthusiasm and were vocal on many aspects. The first session was stopped after reaching a point of saturation where no new opinions or comments were generated. The further sessions did not yield any fruitful addition to the themes already generated.

The mean age of the participants who participated in ODS was 38.5 years, with an average of 7 years of teaching experience. After transcription of the interview data, we used Thematic Analysis to analyse common themes.[8] The ODS resulted in the identification of five themes based on thematic analysis. The themes are described with categories as follows. The themes explain the data's ideas, events or processes and subsume common patterns and codes.[9]

Feasibility and achievability

Control over students is lost, anonymised, the same students repeatedly answer, teachers reflection on his teaching, recorded references, flexibility to listen, no peer disturbances,

Table 2: Responses of participants to questions on online teaching versus traditional teaching.

		Online *n* (%)	Traditional *n* (%)	Chi-square test *P*-value
1.1	Aroused interest in the beginning			
	Always	18 (15.1)	67 (56.3)	
	Frequently	57 (47.9)	41 (34.5)	χ^2=49.03
	Sometimes	34 (28.6)	9 (7.6)	*P*<0.00001
	Seldom	9 (7.6)	2 (1.7)	
	Never	1 (0.8)	0 (0)	
1.2	Specified objectives of the presentation			
	Always	60 (50.4)	80 (67.2)	
	Frequently	35 (29.4)	32 (26.9)	χ^2=11.27
	Sometimes	20 (16.9)	6 (5)	*P*=0.02
	Seldom	3 (2.5)	1 (0.8)	
	Never	1 (0.8)	0 (0)	
2.1	Was able to use verbal cues			
	Always	20 (16.8)	67 (56.3)	χ^2=61.68
	Frequently	38 (31.9)	43 (36.1)	*P*<0.00001
	Sometimes	39 (32.8)	7 (5.9)	
	Seldom	17 (14.3)	2 (1.7)	
	Never	5 (4.2)	0 (0)	
2.2	Was able to use non-verbal cues			
	Always	5 (4.2)	69 (58)	
	Frequently	11 (9.2)	39 (32.8)	χ^2=145.38
	Sometimes	48 (40.3)	6 (5)	*P*<0.00001
	Seldom	25 (21)	2 (1.7)	
	Never	30 (25.2)	3 (2.5)	
2.3	Was able to deliver factual knowledge			
	Always	49 (41.2)	86 (72.3)	
	Frequently	46 (38.7)	29 (24.4)	
	Sometimes	21 (17.7)	3 (2.5)	χ^2=27.36
	Seldom	2 (1.7)	1 (0.8)	*P*<0.0001
	Never	1 (0.8)	0	
2.4	Was able to impart higher-order thinking			
	Always	18 (15.1)	58 (48.7)	
	Frequently	40 (33.6)	45 (37.8)	
	Sometimes	53 (44.5)	14 (11.8)	χ^2=45.74
	Seldom	4 (3.4)	2 (1.7)	*P*<0.00001
	Never	4 (3.4)	0	
3.1	Was able to ask questions to students			
	Always	20 (16.8)	88 (74)	
	Frequently	34 (28.6)	27 (22.7)	
	Sometimes	43 (36.1)	4 (3.4)	χ^2=91.07
	Seldom	16 (13.5)	0	*P*<0.00001
	Never	6 (5)	0	
3.2	Students were able to ask questions			
	Always	21 (17.7)	52 (43.7)	
	Frequently	26 (21.9)	33 (27.7)	
	Sometimes	52 (43.7)	23 (19.3)	χ^2=28.39
	Seldom	16 (13.5)	10 (8.4)	*P*=0.00001
	Never	4 (3.4)	1 (0.8)	

(Contd...)

Table 2: *(Continued).*

		Online *n* (%)	Traditional *n* (%)	Chi-square test *P*-value
3.3	Was able to reward pupil effort			
	Always	15 (12.6)	63 (52.9)	χ^2=73.24
	Frequently	29 (24.4)	41 (34.5)	*P*<0.00001
	Sometimes	42 (35.3)	10 (8.4)	
	Seldom	20 (16.8)	1 (0.8)	
	Never	13 (10.9)	4 (3.4)	
3.4	Was able to provide feedback to students			
	Always	20 (16.8)	61 (51.3)	
	Frequently	40 (33.6)	38 (31.9)	χ^2=40.23
	Sometimes	41 (34.5)	15 (12.6)	*P*<0.00001
	Seldom	14 (11.8)	4 (3.4)	
	Never	4 (3.4)	1 (0.8)	
4.1	Was able to start class on time			
	Always	47 (39.5)	79 (66.4)	
	Frequently	46 (38.7)	34 (28.6)	χ^2=20.32
	Sometimes	19 (16)	5 (4.2)	*P*=0.0004
	Seldom	5 (4.2)	0	
	Never	2 (1.7)	1 (0.8)	
4.2	Was able to end class on time			
	Always	53 (44.5)	71 (59.7)	
	Frequently	37 (31.1)	38 (31.9)	χ^2=12.62
	Sometimes	23 (19.3)	8 (6.7)	*P*=0.01
	Seldom	5 (4.2)	0	
	Never	1 (0.8)	2 (1.7)	
4.3	Was able to complete the specific learning objective's in the given time			
	Always	43 (36.1)	72 (60.5)	
	Frequently	51 (42.9)	45 (37.8)	χ^2=26.12
	Sometimes	19 (16)	1 (0.8)	*P*=0.00003
	Seldom	5 (4.2)	1 (0.8)	
	Never	1 (0.8)	0	
4.4	Were able to control the students for smooth execution of class			
	Always	19 (16)	55 (46.2)	
	Frequently	33 (27.7)	48 (40.3)	χ^2=55.46
	Sometimes	36 (30.3)	14 (11.8)	*P*<0.00001
	Seldom	15 (12.6)	1 (0.8)	
	Never	16 (13.4)	1 (0.8)	
5.1	Was able to summarise the most important points			
	Always	47 (39.5)	80 (67.2)	
	Frequently	51 (42.9)	35 (29.4)	χ^2=24.25
	Sometimes	20 (16.8)	3 (2.5)	*P*<0.00001
	Seldom	1 (0.8)	1 (0.8)	
	Never	0	0	
6.1	Were the sessions overall effective?			
	Always	11 (9.2)	63 (52.9)	
	Frequently	61 (51.3)	50 (42)	χ^2=66.94
	Sometimes	40 (33.6)	5 (4.2)	*P*<0.00001
	Seldom	5 (4.2)	0	
	Never	2 (1.7)	1 (0.8)	
6.2	Were you satisfied with your performance?			
	Always	13 (10.9)	68 (57.1)	
	Frequently	64 (53.8)	45 (37.8)	χ^2=65.76
	Sometimes	31 (26.1)	4 (3.4)	*P*<0.00001
	Seldom	7 (5.9)	0	
	Never	4 (3.7)	2 (1.7)	

n: Total number of participants (119)

initial excitement, later dwindled, no accountability, attendance inadequate, small groups.

Technical expertisation

It is a new mode of teaching with possibility of technical glitches, issues with Internet connectivity, influenced by earlier experiences. It requires IT support during sessions and sometimes needs troubleshooting from the teachers during classes. It hinders learning due to easy access and student control on mute and unmute button.

Future direction and hitches

Doubt about theory teaching, poll and quizzes, unable to cover all aspects, lack of practical exposure, skill inadequacy, zoom fatigue, blended approach, institution support and certification of competencies is challenging.

Target and changes

Online sessions are a must for post graduate training programs. Micro teaching sessions can be conducted and evaluated online. Shorter class can be planned, pre-reading materials can be shared. Specific topics need to be identified that suits online sessions.

Technical implementation

Choosing appropriate learning resources, copying free images and materials, incorporating quizzes and polls, self-directed learning, challenging to deliver all the content, room break-out options, multiple small-group techniques, journal club, seminars and case presentations.

Transcripts from participant 1

I have been teaching online during this lockdown period, I felt that the control over the students was lost, and only particular students were responding to the questions asked after the online teaching. The advantage of online teaching would be.We get the recorded videos and look for the pros and cons of it. As the students sit at home for online classes, there won't be any peer disturbances. Although students were excited about the online classes at the initial stage of the introduction during lockdown, they have started dwindling. Attendance throughout the online class was inadequate, and if the groups are small, then online teaching would be more appropriate.

Transcripts from participant 2

At the beginning, I was thinking that it is a new mode of teaching which might have technical glitches and little scared about. 'I was wondering what will happen if we get poor internet connectivity during the online class.' I do had such experience during the beginning of the online mode classes, and in due course of time, I managed with the help of technical experts. I strongly believe that we need a IT support staff at college for troubleshooting during the problematic situation. In due course of time, I learnt how to attend the issue and also learned from my fellow faculty. The advantage of online teaching would be 'we can mute when we experience any disturbance from any students which would not be possible in conventional classroom.'

Transcripts from participant 3

According to me, online teaching is not that much useful in theory teaching; rather, it can be very much useful in poll and conducting quiz among students. If we intend to cover a lesson, it is very difficult, and we are unable to cover all aspects as described in the curriculum. Student might feel lack of practical exposure on subject thought. Some topics need hands-on training where we need the skills to be demonstrated, failing which may result in skill inadequacy. As many classes are online, there is a fatigue called Zoom fatigue among students. So I strongly support a blended approach to execute that we need the institutional support. Another major issue of online classes would be the certification of completion of the students when we conduct exams online, and it is really a challenging one.

DISCUSSION

Our study found that faculty faced many challenges in executing an online class compared to conventional classes in facilitating student engagement, rewarding pupils, providing feedback, and having effective communication in terms of using verbal and non-verbal cues during lectures. The current pandemic situation has forced medical instructors to switch to online teaching when compared to conventional/traditional teaching to continue the learning process. Most medical instructors have not been exposed to online teaching as they were trained and taught by conventional methods. The introduction of technology-based integration has been stressful to the faculty, and it has been observed that for effective technology integration to happen, teacher readiness is the essential key factor. By teacher readiness, we mean technical knowledge, training and preparation in the specific mode of teaching,[8,10] which is similar to the findings of our study. In a study, many teachers expressed that they would like to be comfortable before using a specific tool as a mode of instruction to students; the faculty expressed the same opinion in our study in open-ended questions.[11] Various studies also establish that many teachers lack the skills to integrate technology into online classes,[12] and not all faculty members are suited to teach online due to differences in their teaching style.[13]

In our study, faculty faced challenges like starting and ending lectures on time due to technical glitches and expressed during

a ODS that technical support from the institution is essential for online classes. Similar findings on peer and institutional support have been reported; for example, a study by Bennett and Lockyer reported that faculty got comfortable with online teaching by interacting with knowledgeable professionals, peers and through continuous professional development.[14] Continued professional development focussing on this area amongst instructors is essential for the effective integration of technology for online lectures and better learning outcome of student learning outcomes.[15] A study conducted by Nokwali *et al*. reported that 'Teachers need not only technical but also administrative, parental, and peer support.'[16]

The next most crucial challenging factor is the time constraint for adapting to new technology. Faculty reported that difficulties were encountered in completing the specific learning objectives of the topic and ensuring smooth execution of the class due to student behaviour, and technical and internet issues, which is similar to report findings from Apple Classrooms of Tomorrow research which stated, 'teachers need time to move through different stages of development in order to utilise technology, or any innovation for that matter, to their advantage.'[17]

Christianson *et al*., in a study amongst nursing faculty, reported that highly interactive and effective, but in our study, we found that in terms of the ability of students to answer questions during the class and the teachers to ask questions to students was better in traditional classroom settings.[13] Faculty expressed difficulty communicating effectively using verbal and non-verbal cues during online lectures.

Similar to our study, a study on higher education in India amongst 800 odd respondents reported that the traditional method is preferred when compared to online teaching as we lack the necessary support like tools and infrastructure to adopt and sustain the online mode of teaching[18]

There are some well-known advantages of online teaching as listed by our faculty, the most important being continuing medical education despite COVID-19, and facilitating COVID appropriate behaviour amongst students and faculty. For faculty, it provides the flexibility of location and time that are not always present under the traditional delivery of lectures.[19] For students, it enhances student independence and student retention and facilitates high-order thinking though only 11 faculty felt that they could impart high-order thinking skills during an online lecture class compared to 34 faculty during traditional/conventional lecture classes.

A focus group, which social science researchers use, efficiently obtains qualitative data from multiple participants. Focus groups are less threatening and may provide a deeper understanding of the phenomena by encouraging group participants to compare their experiences and other instructor experience. Comparison, in turn, highlights either consensus or diversity of experiences on a topic. In this qualitative, descriptive study, focus group methodology, as described by Krueger and Casey,[8] guided data collection and analysis to uncover online faculty perceptions of what constitutes how satisfied are they with online teaching, the effectiveness of online classes, to share personal examples in a non-threatening group discussion.

Focus groups that are well designed usually last between 1 h and 2 h.[10] Unlike one-on-one interviews, focus groups permit participants to express and clarify their views, creating a synergy of information that is valid. ODS was executed on the Zoom portal due to the COVID-19 background. The interaction was recorded after obtaining permission from all the participants. To assure accuracy, each session was transcribed verbatim, and the investigators verified the accuracy

In a stream like medicine, where we need an explanation of concepts and mechanisms with the help of figures, flowcharts, and diagrams, we require a significant amount of engagement between students and teachers for effective learning. To attain this effective learning, simple audio recordings may not be adequate as in online teaching, students and teachers are not interacting in a real-time environment. Online lecture recordings should preferably be used for revisions in situations when some concepts are unclear; students have the option of replaying them.[20] According to Parija and Adkoli, it is necessary to retrain and reorganise the faculty with the new demands of technology to implement virtual curriculum and assessment in India.[21] However, if it is necessary to sustain an online mode of teaching, some suggestions to overcome the challenges of online teaching have been reported in studies like providing learning material to students before the class, sustaining students' connection during the class, slow pace with more discussions, and cross-questioning. And also pre-recorded videos can be shared to complete the learning objectives.[22]

Online teaching is the need of the hour in the current pandemic, but it cannot be a substitute for traditional classroom teaching but rather a 'supplement' to continue the learning process.

CONCLUSION

Faculty were overall not satisfied with online lecture classes as they had trouble in providing set induction and adequate closure, enabling pupil participation during a presentation like asking questions, rewarding pupil effort and time management skills like starting class on time, ending on time, completion of specific learning objectives in comparison to traditional/conventional lecture class.

Recommendations

- Based on the study results, we would like to suggest the following recommendations in the teaching-learning method in medical and paramedical courses

- Sensitisation of students for the online teaching-learning process
- Conduct more Faculty Development Programme (FDP) in online teaching
- Infrastructure and technology supplementation by medical colleges for the content development of online teaching
- Incorporate online teaching as one of the skills/ competencies for postgraduate training.

Declaration of patient consent

Institutional Review Board (IRB) permission was obtained for the study.

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Conflicts of interest

There are no conflicts of interest.

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