Original Research Article

Face to face education to virtual classroom in the health sector during covid pandemic

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ABSTRACT

Background: The lockdown posed a great impact on teaching and learning process which aided in the shift of face to face education to virtual classroom. As the e- learning was newly introduced, it was difficult to execute initially due to prior unpreparedness.

Aim: We put forth this study to analyse student's perspective and challenges faced in online education during pandemic times.

Settings and Design: The study was done in medical and allied health science colleges of Chennai and Puducherry. This is cross-sectional study conducted between June and August 2020.

Materials and Methods: This is an online survey conducted through google forms circulated to undergraduates and post graduates of medical and allied health science courses.

Statistical Analysis: Frequencies and percentages were used to express the data. Statistical Analyses were done by SPSS software and graphs were made by Microsoft excel.

Results and Conclusion: We received response from 419 participants. Mobile phone was the widely used gadget to access online class. Most of the institutes conducted online class daily and assessment twice weekly. In student's point of view, though e- learning had several disadvantages like poor net connectivity, clinical training inadequacy, difficulty in attending class for longer duration and unfavourable learning environment, it proved constructive at pandemic time. On improvement in the design of the learning environment and teaching system, the online learning platform would better to serve its purpose in future pandemic.

1. Introduction

The pandemic was declared by World health organization (WHO) in march 2020 due to rapid spread of corona virus disease (COVID 19).[1] Worldwide spread of novel Corona virus infection has imposed lockdown, social distancing and shift to online education.[1,2] Bao said that COVID-19 lockdown led to closure of educational institutes will impose an impact on the education.[3] About 600 million school goers were affected due to closing of the educational institution[4] including 320 million from India.[5] The closure of educational institution hindered the teaching learning process. Online learning was adopted by the educational institutions which created a shift from offline learning to virtual learning. The scope of digital education has excelled obviously after the pandemic outbreak. The process of

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learning happens through three elements, that is social presence, cognitive presence and teaching presence. The challenge was felt from both the teaching and learning perspectives. Medical professionals who specialized in chalk and board or Power point were obliged to learn the art of online format. The faculty had to participate in various training programs to get them trained to adapt themselves to the change in Pedagogy. Furthermore, due to the government's protracted lockdown for the public's welfare, the learners were to participate in virtual education.[6] Online class will be more effective than offline when it is designed and executed appropriately.[7] Even though it gained a positive impact in improvement of learning efficiency and performance, it lays discrimination to poor and marginalised students. Student's feedback regarding online education is essential to improve the teaching learning process. So we put up this study to identify the mode of learning and evaluate student's perspective and challenges faced in online education during COVID 19 pandemic. The study is considered more appropriate as it is conducted in the place where classroom education played a major role. Furthermore, this study was used to explore the effectiveness in educating the health sector online that requires ample clinical and practical knowledge.

2. Materials and Methods

This online survey included 419 participants of undergraduate and postgraduate courses of Medical and Allied Health Science. The survey was conducted between June and August 2020 through Google form after an informed online consent. The questionnaire for the study included participant's demographic profile, awareness and training in e- learning application, device utilized and network facility, online class structure and schedule, conducting practical/ clinical class and assignment, student's perspective in online education.

2.1. Statistical analysis

Data was expressed in frequencies and percentages. Statistical analyses were done by SPSS software and graphs were made by Microsoft excel.

3. Result

3.1. Participant characteristics

Our cross- sectional online survey included 70.5% of females and 29.5% of males (Figure 1). Undergraduate and post graduate students from various courses like medical, dental and allied health science participated in our survey (Figure 2). Participants belonged to various medical and allied health science colleges in Chennai and Puducherry.

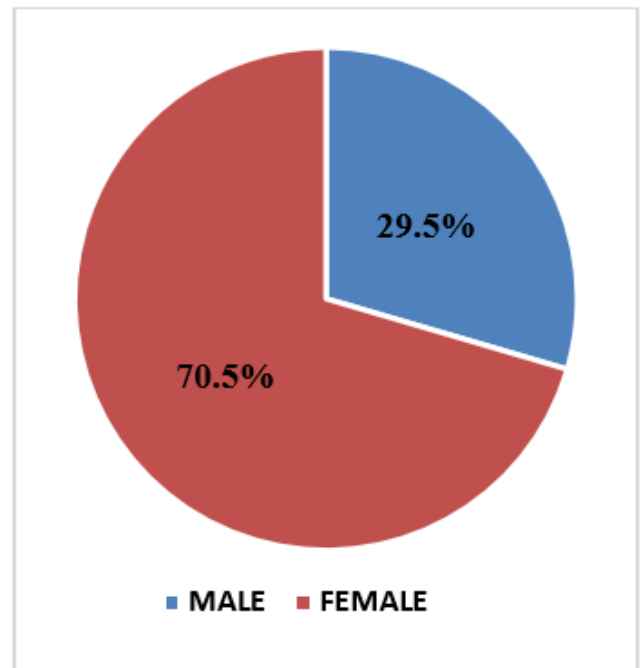31.7% were unaware and 68.3% were aware of e-learning platform even before the pandemic. 43.7% had a

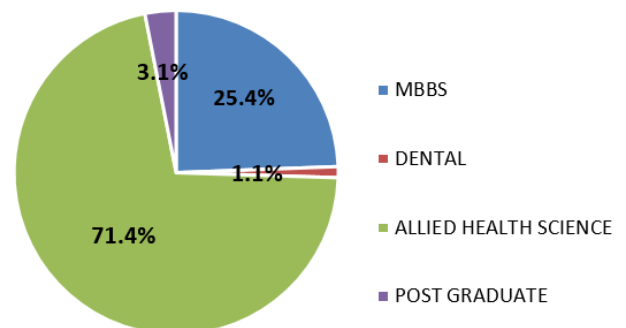**Fig. 1:** Sex distribution of the study population

Fig. 2: Education characteristics

Table 1: Awareness and training on e-learning applications

Variables	Frequency (n)	Percentage (%)
Awareness of online education before the pandemic		
Yes	286	68.3
No	133	31.7
Knowledge on usage of online platform / application		
Yes	183	43.7
No	236	56.3
Hands on training given on how to use online platform/ application		
Yes	196	46.7
No	223	53.3
Mode of learning on usage of e-learning applications		
On my own	291	69.5
Online videos	34	8.1
Friends and Family	85	20.3
Others	9	2.1

prior knowledge on how to use the e- learning applications and 46.7% were given hands on training in their respective platform used to educate students. Rest of the participants who did not undergo hands on training learnt the usage of e-learning applications on their own (69.5%), through friends or family (20.3%) and by watching online videos (8.1%) (Table 1)

3.2. Device utilised and network facility

The device used for attending classes were mobile, tablet, i-pad and laptop. Majority (93.7%) of the participants accessed the class only through mobile phone. Zoom, Google meet, Cisco WebEx were commonly used platform to conduct class online. Among various applications, combined usage of the applications was noted in 32.2% of study participants. 77.5% of students purchased a separate net connection in the form of mobile data packs for themselves to attend the classes. 298 (71.1%) of participants faced technical glitches during their online class mainly due to poor network. (Table 2)

**Table 2:** Technical difficulties faced in online

Variables	Frequency (n)	Percentage (%)
Technical glitches		
Yes	298	71.1
No	121	28.9
Reason for technical glitch		
Poor network	209	0.1
Problem with the mobile	89	29.9

3.3. Online class structure and schedule

E-learning for the medical and allied health science courses consisted of live lectures (34.3%), recorded lectures (2.8%), e-handouts (1.4%), online group discussion (6%), video conferences (5%) and demonstration (0.8%) which is depicted in the graph below (Figure 3). Majority (75.6%) responded that they received study materials like notes, power point presentations, video links and lecture handouts after completion of each and every class. 47.4% of students replied that their institution scheduled online classes daily, while for 15% of the participants revealed that no live class is taken online due to technical difficulties and portion completion, but they receive e- handouts or video links as a part of e- learning activity. (Table 3)

3.4. Conducting practical/Clinical class and assignment

Practical / Clinical class was conducted for the students in the following methods: live demonstration (14.2%), link to assess video (9.7%), notes (1.4%), recorded demonstrations (11.2%) and oral lectures (11.6%). 29.3% followed a
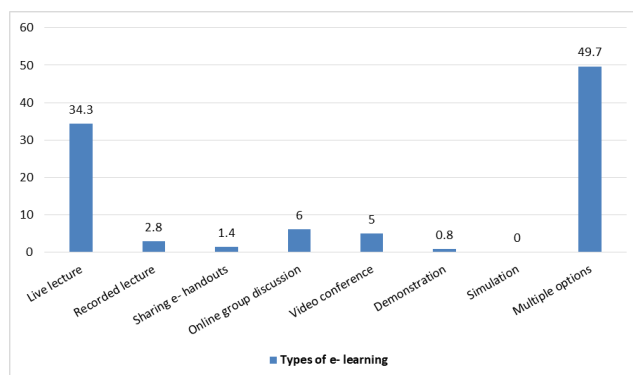

Fig. 3: Types of e-learning adopted in institution

Table 3: Online class structure and schedule

Variable	Frequency (n)	Percentage (%)
Schedule of online class		
Conducted daily	199	47.4
Conducted more than 3 days a week	77	18.3
Conducted less than 3 days a week	81	19.3
Not conducted	62	15
Reason for not conducting class		
Portions are completed before lockdown	12	18.8
Large population, making it difficult to conduct class	8	12.8
Students are not interested to attend	4	6
Technical difficulties	20	32.4
Multiple reasons	18	30

combined approach in teaching practical / clinical session (Figure 4). 259 (61.8%) of students felt like that online education will not improve their clinical skills in medicine.
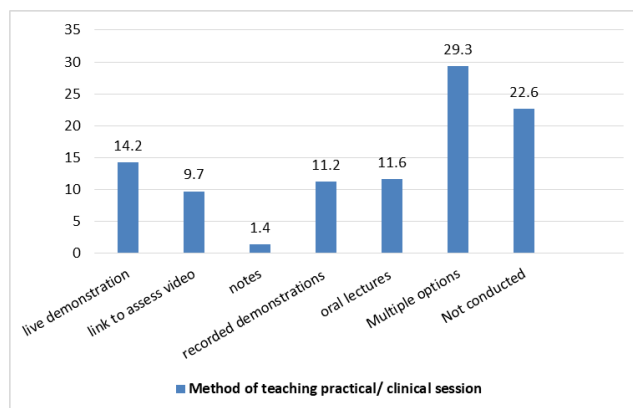
Fig. 4: Method of teaching practical / clinical session

The success of the online education can be tested only through assessments. 34.6% of participants replied that their institute conducted assessment 2 times / week, which can be submitted online (Figure 5).
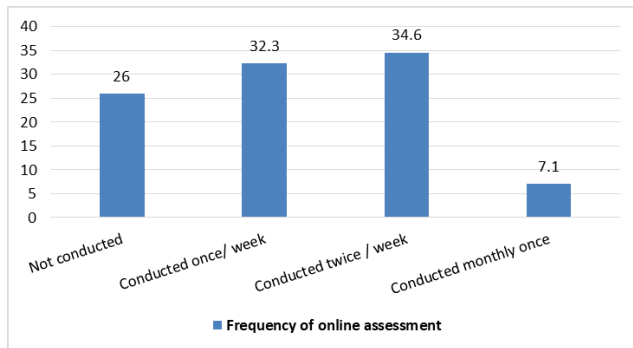

Fig. 5: Frequency of online assessment

The assignments were in the form of MCQs using google form, very short answer, short answer and essay. Majority (56.6%) of assessments were in the form of MCQs using google form as it was an easy way to evaluate (Table 4).

Table 4: Format of online assessment

Variable	Frequency (n)	Percentage (%)
Format of online assessment		
MCQs using google form	237	56.6
Very short answer	11	2.6
Short answer	24	5.8
Essay	16	3.8
Multiple option	131	31.2

3.5. Student's perceptions about online education

84.9% attended class regularly and only 1.9% of participants never attended class (Figure 6). 58% uttered that they attended the class to gain knowledge. Others attended for purpose of attendance (10%), faculty (2.1%) and parent (0.2%) compulsion. When questioned about their opinion on reading books online, 290 (69.3%) of participants felt it was difficult to read books online (Table 5).

Majority (43.9%) of students prefer to attend all types of classes, followed by 17% wish to attend Interactive session and 16.2% like to attend only practical/ clinical demonstration class (Figure 7).

When asked about what would they do if class is not interesting, 38.6% of students responded that they just kept the gadget on and did not listen when the class was boring, while some prefer to leave the session (23.4%) and some prefer to minimize the screen and play games or chat online (6%) (Figure 8).
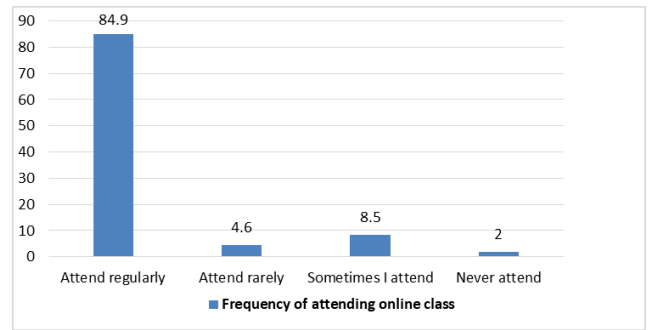

Fig. 6: Frequency of attending online class

Table 5: Students perception on online education

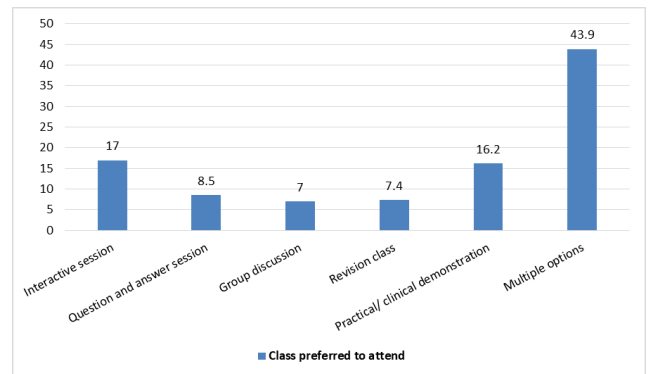| Variable	Frequency (n)	Percentage (%)
Purpose of attending online class		
To gain Knowledge	243	58
For Attendance	42	10
Faculty compulsion	9	2.1
Parents compulsion	1	0.2
Multiple options	124	29.7
Opinion about reading books online		
Difficult to read e-book/ pdf for a long time	290	69.3
I can't mark the important points	85	20.2
I prefer reading e- books/ pdf than textbooks	44	10.5

**Fig. 7:** Class preferred to attend

61.1% of students wish to spend only 1-2 hours per day for their online classes while 5.3% were not interested to attend any online classes (Figure 9). 267 (63.7%) felt that they were distracted while attending online class which would be avoided in face to face education.

4. Discussion

For almost 2 years, Covid-19 has globally upended all sectors including Education. Various alternatives have been adopted in our education system to quench the knowledge
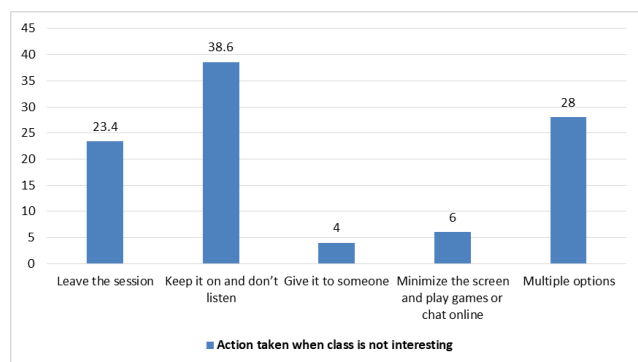
Fig. 8: Action taken if class is not interesting
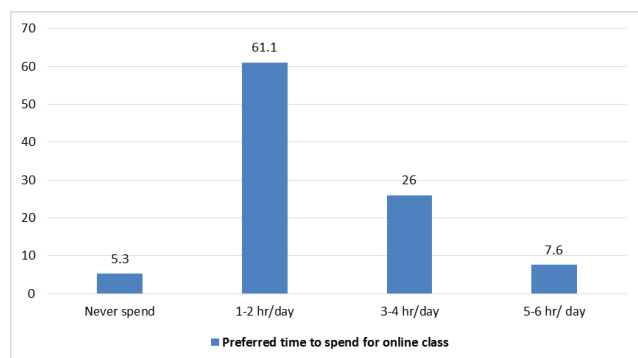
Fig. 9: Duration of hours to be spent for online class

thirst among students. In developing countries like India Education system revolves around traditional offline mode of teaching – face to face interaction with the students – an effective mode of imparting knowledge. The lockdown has made the Education Institutions across the globe to close down; forcing to shift to remote learning, creating a paradigm shift from offline to online learning.[3,8]

The importance of Digital Technology was felt and it has formed a new shape catering to the needs of the nation. In the recent few decades, there has been much advancement in educational technology, which has proven to be extremely valuable during this pandemic.[9,10] The acquiring of knowledge through this platform by the students depends on availability or access to learning tools, training to utilize the platform for students and instructors.

Mobile phone was the gadget used by 93.7% of the participants to attend online class. While Shim's study identified laptops (69.8%) as the most commonly used means for e- class.[7]

32.2% of students answered they had combined usage of applications for teaching online. Many students had a separate net connection only for their online classes and 70.1% reported that they faced the problem of poor network connectivity. Students have unequal learning opportunities due to discrimination against better internet facilities. Network instability would disrupt online classes

and influences interaction between the teacher and students or among students.[11]

Our study included questions on conducting practical/ clinical class and assignment. Students replied that practical / clinical class was conducted in the form of live demonstration, link to assess video, notes, recorded demonstrations and oral lectures. 61.8% of students felt like only practice but not online teaching will improve their clinical skills in medicine. Development of virtual clinical experiments with incorporation of pictures/data of actual equipment, show good results from real experiments and can overcome this pitfall.[12]

The success of the e-Learning program depends mainly on the performance of students and instructors.[13]

To evaluate the knowledge of the observer, online assessments were conducted. Assessment was conducted 2 times/ week for 34.6% of participants and 26% don't have assessment. Majority reported that assessments were in the form of MCQs using google form as it was easy way to evaluate. For assignments other than MCQs, it should be written in notebook and pdf file from the picture of written document should be uploaded online for evaluation, thus encouraging the writing practice of students.

Several questions were asked to evaluate the student's perception about online education. Majority (84.9%) responded that they attended class regularly as compared with 14.1% in Kapasia et al study.[14] Many attended the class to gain knowledge. And few people attended for purpose of attendance, compulsion of faculty or parent. 69.3% of participants felt difficult to read books online so they preferred textbooks over e- books. Many students wish to attend interactive session and practical/ clinical demonstration class. Teacher's interaction with students during online class will impact on the student's perceptions and performance.

The limited time for learning, interpretation and assessment makes the student dissatisfied and bored. Majority (61.1%) of students like to spend only 1-2 hours per day for their online classes while 5.3% were not interested to attend any online classes. Some prefer face to face education is advantageous over virtual classroom as there is no distractions. Alexander et al. reported that students not understand their assignments, technical difficulties and distractions by engaging in unwanted activities like checking Facebook while taking classes was noted in online learning.[15]

Some students agree that e- learning is convenient as it brings the education to doorstep which is in agreement with Shim et al. findings.[7] Students who prefer online classes regarded it to be flexible and convenient.[16]

In future, effective implementation of e- learning would be better if factors like student–teacher ratio, modality, pedagogy, the role of the student and teacher, lecturer communication, online assessments, and feedback are taken

into consideration. [17] Uniformity in planning and execution of e- learning by all the colleges is essential to cater education without discrimination during this pandemic.

5. Conclusion

E- Learning is the only alternative to classroom learning at pandemic times. Though there are several advantages in online education; it possesses few disadvantages like technical issues, poor net connectivity, non-availability of gadgets, technological expertise and poor clinical skill training. So, by rectifying these problems e- learning would be best and convenient option for educating students during present and future pandemic crisis.

6. Source of Funding

None.

7. Conflict of Interest

The authors declare no conflicts of interest. The authors alone are responsible for the content and writing of the article.

References

1. World Health Organization. WHO timeline-Covid-19; 2020. Available from: https://www.who.int/news-room/detail/08-04-2020-who-timeline---covid-19.
2. Gonzalez T, DeLaRubia MA, Hincz KP, Comas-Lopez M, Subirats L, Fort S, et al. Influence of COVID-19 confinement on students' performance in higher education. *PloS one*. 2009;15(10):e0239490.
3. Bao W. COVID-19 and online teaching in higher education: A case study of Peking University. *Hum Behav Emerg Technol*. 2020;2(2):113–5.
4. Goyal S. Impact of Coronavirus on Education in India. Available from: https://www.jagranjosh.com/articles/dmrcresult-2020-released-delhimetrorailcomcheck-cut-off-marks-1587122899-1%3Fitm.2020.
5. UNESCO. Education: From disruption to recovery. Available from: https://en.unesco.org/covid19/educationresponse/.
6. Lederman D. Will shift to remote teaching be boon or bane for online learning; 2020. Available from: https://www.insidehighered.com/digital-learning/article/2020/03/18/most-teaching-going-remote-will-help-or-hurt-online-learning.
7. Shim TE, Lee SY. College students' experience of emergency remote teaching due to COVID-19. *Child Youth Serv Rev*. 2020;119:105578.

8. Martinez J. Take this pandemic moment to improve education; 2020. Available from: https://edsource.org/2020/take-this-pandemic-moment-to-improve-education/633500.
9. Chatterjee I, Chakraborty P. Use of information communication technology by medical educators amid covid-19 pandemic and beyond. *J Educ Technol Syst*. 2021;49(3):310–24.
10. Dhawan S. A panacea in the time of COVID-19 crisis. *J Educ Technol Syst*. 2020;49(1):5–22.
11. Trentin G. Pedagogical sustainability of network-based distance education in university teaching. In: Focus on Distance Education Developments; 2007. p. 79–106.
12. Gamage KA, Wijesuriya DI, Ekanayake SY, Rennie AE, Lambert CG, Gunawardhana N, et al. Online delivery of teaching and laboratory practices: continuity of university programmes during COVID-19 pandemic. *Educ Sci*. 2020;10(10):291.
13. Thongsri N, Shen L, Bao Y. Investigating factors affecting learner's perception toward online learning: evidence from ClassStart application in Thailand. *Behav Inf Technol*. 2019;38(12):1243–58.
14. Kapasia N, Paul P, Roy A, Saha J, Zaveri A, Mallick R, et al. Impact of lockdown on learning status of undergraduate and postgraduate students during COVID-19 pandemic in West Bengal, India. *Child Youth Serv Rev*. 2020;116:105194.
15. Alexander MW, Truell AD, Zhao JJ. Expected advantages and disadvantages of online learning: Perceptions from college students who have not taken online courses. Issues in Information Systems. *Issues Inf Syst*. 2012;13(2):193–200.
16. Daymont T, Blau G, Campbell D. Deciding between traditional and online formats: Exploring the role of learning advantages, flexibility, and compensatory adaptation. *J Behav Appl Manag*. 2011;12(2):156.
17. Means B, Bakia M, Murphy R. Learning online: What research tells us about whether, when and how. Taylor & Francis; 2014. p. 232.

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