## Original Research Article

# Preferences, perceptions and barriers to E-learning among medical students during COVID-19 pandemic lockdown in India

## Deodatt M. Suryawanshi*, Raghuram Venugopal

Department of Community Medicine, Trichy SRM Medical College Hospital and Research Centre, Trichy, Tamil Nadu, India

**\*Correspondence:**
Dr. Deodatt M. Suryawanshi,
E-mail: drdeodattms1983@gmail.com

**ABSTRACT**

**Background:** Following the imposition of the nationwide lockdown on 24th March 2020, many medical institutions adopted E-learning as a method to ensure continuity in medical education. Understanding perceptions and preferences of medical students and addressing their barriers are essential for a seamless learning experience.

**Methods:** Data was collected using a semi-structured online questionnaire after obtaining informed consent. A total of 296 students of the second year MBBS and pre-final year were recruited using non probability sampling. Data pertaining to 286 students who returned the questionnaire was entered in Microsoft excel and analysed using SPSS version 21.

**Results:** Majority of the participants 179 (62.5%) were female. Only 18 (6.2%) had advanced computer and internet usage skills. 138 (48.2%) students showed preference for blended mode of teaching. 203 (71.0%) of students showed preferences for non-interactive learning methods like slide share and YouTube videos. 180 (62.9%) cited that lack of personal interaction with the teacher followed by access to internet 67 (23.4%) and lack of hardware 53 (18.5%) as barriers in the e-learning. Significant differences were observed between female and male students in the teaching methods with regards to ease of understanding (p=0.009) and use of non-interactive platforms for e leaning (p=0.03).

**Conclusions:** The study identified blended learning as an acceptable method of learning medical curriculum. Schedule flexibility, ease of understanding and absence of monotony of classroom teaching made e-learning more acceptable. lack of teacher-student interaction, lack of accesses to high speed internet and hardware were barriers perceived to e-learning among medical students.

**Keywords:** Barriers, E-learning, Medical students, Perceptions, Preferences

## INTRODUCTION

On 24th March 2020, the Indian Government ordered a nationwide lockdown to mitigate the impact of COVID-19 pandemic.[1] Following this many State governments ordered suspension of all its educational institutions to ensure social distancing.[2-5] All the undergraduate medical students were sent to the safe confinement of their homes until the completion of lockdown. Initially for a period of 21 days, the lockdown was repeatedly extended, which added to the anxiety of medical students as it impacted their medical education.[6] Continuing medical education during this period was a challenge to administrators, institutions, academicians, parents and most importantly the students. During this period, many institutions adopted e-learning as a method to ensure continuity of medical education.

E-learning also described as tele teaching, online learning, internet learning, distance education is learning through utilizing electronic technologies to access educational curriculum outside of a traditional classroom,

in most cases, it refers to a course, program or degree delivered completely online.[7,8] It is interactive in that you can also communicate with your teachers, professors or other students in your class. Sometimes it is non interactive been like pre-recorded lectures delivered online.[7]

Following lockdown, interactive online platforms such as Google meet, Zoom, Cisco, WebEx have gained popularity as they offer a better student teacher interaction. Non interactive e-learning modes like pre-recorded videos on streaming sites like YouTube, and PowerPoint presentations on Slide Share and WhatsApp are also popular.

As the Pandemic shows no sign of abating, E-learning will be the new normal. So to actively engage and maintain students's interest in e-learning, institutions should consider their preferences and perceptions. India being a highly diverse country attract students from various socio-economic backgrounds, where access to high speed internet, computer or smart phone is limited and disproportionate. Administrators, policy experts and academicians should therefore be conscious of this reality and provide a universally feasible and acceptable option to the students. Hence this present study was undertaken to assess the preferences, perceptions and perceived barriers to e-learning among medical students in a medical college in South India.

### Objectives

To study the preferences and perceptions of medical students towards e-leaning and to assess the perceived barriers and merits of e-learning.

### METHODS

The present study, using a mixed method approach incorporated questions pertaining to both qualitative and quantitative components of e-learning and made an attempt to study the perceptions, preferences and barriers to e-learning among medical students in South India.

The present study was conducted in the month of April to June 2020, the investigators recruited participants through online questionnaire using Google forms. A total of 296 students belonging to the second year MBBS and pre-final year were recruited using non probability sampling. 286 students returned the questionnaire.

There was no scheduled teaching by the department for 1st year MBBS student during this period so they were not recruited in the study. The investigators used a semi structured online questionnaire after obtaining informed consent which included the questions on demographics details, their perception, preferences, merits and barriers to e-learning. Some questions were kept open ended where multiplicity of responses was expected from the participants.

The data was entered in MS excel version 2016 and analysed using SPSS v 21. Independent student T test was used as the test of significance and a p value of less than 0.05 level was considered as significant.

### RESULTS

The present study used online methods for assessment of preferences and perceptions of medical students as students were away from the medical institutions due to COVID-19 pandemic. Out of the 286 students who participated is the online survey 179 (62.5%) were female and 107 (37.5%) were male. Majority of the participants 221 (77.2%) were in the age group of 18 to 20 years. Mean age of study participants was 20 years with standard deviation of 1.38 (Table 1).

In the present study computer and internet usage skills of 153 (53.4%) students were rated as proficient, 115 (40.2%) as learner and 18 (6.2%) as advanced (Table 2).

In the present study, 138 (48.2%) students replied that they preferred the blended mode of teaching i.e. both the classroom and online. 174 (60.8%) of students replied that classroom teaching is easy to comprehend while 112 (39.1) replied that online teaching is easy to comprehend. There was a significance difference observed between female and male students on the easier mode of teaching (p =0.009) (Table 2).

In the present study, 203 (71.0%) of students showed preferences for non interactive learning methods like WhatsApp, PowerPoint presentation, Slide share and YouTube videos. In the non interactive E-learning methods, majority of the students 105 (36.7%) preferred pre-uploaded YouTube videos as learning tools. There was a significant difference observed between female and male students for preferences of non-interactive teaching platforms (p=0.03).

In the interactive e-learning platforms, 135 (47.2%) students preferred YouTube live, 63 (22%) Zoom /Google meet while remaining 29 (10.1) preferred Instagram and Facebook live.

In the present study 134 (46.8) students replied that the combination of factors like flexible timings, ease of understanding and absence of monotony are the advantages of e-learning while, 127 (44.4%) students replied that the advantages of e-learning is the flexibility of timings only.

**Table 1: Demographics and preferences.**

| Variables | | Gender | | Total (n=286) (%) | P value |
|---|---|---|---|---|---|
| | | Female (n1=179) (%) | Male (n2=107) (%) | | |
| Age in years | 18.0-20.0 | 142 (79.3) | 79 (73.8) | 221(77.2) | NA |
| | 21.0-23.0 | 35 (19.5) | 27 (25.2) | 62 (21.6) | |
| | 23.0+ | 2 (1.10) | 1 (0.9) | 3 (1.0) | |
| | Total | 179 (62.5) | 107 (37.5) | 286 | |
| Preferred teaching mode | Blended teaching (classroom and online) | 90 (50.2) | 48 (44.8) | 138 (48.2) | 0.07 |
| | Classroom teaching | 53 (29.6) | 45 (42.0) | 98 (34.2) | |
| | Online teaching | 36 (20.1) | 14 (13.0) | 50 (17.4) | |
| Which teaching method is easy to comprehend? | Classroom teaching | 99 (55.3) | 75 (70.0) | 174 (60.8) | 0.009 |
| | Online teaching | 80 (44.6) | 32 (29.9) | 112 (39.1) | |
| Rate of computer and internet skills | Proficient | 97 (54.1) | 56 (52.3) | 153 (53.4) | 0.6 |
| | Learner | 71 (39.6) | 44 (41.1) | 115 (40.2) | |
| | Advanced | 11 (6.1) | 7 (6.5) | 18 (6.2) | |
| Preferences for e-learning methods | Non interactive | 134 (74.8) | 69 (64.4) | 203 (71.0) | 0.09 |
| | Interactive | 45 (25.1) | 38 (35.5) | 83 (29.0) | |
| Preferences in interactive Platform | YouTube live | 88 (49.1) | 47 (43.9) | 135(47.2) | 0.07 |
| | Zoom/Google Meet | 43 (24.0) | 20 (18.6) | 63 (22.0) | |
| | Any other | 29 (16.2) | 30 (28.0) | 59 (20.6) | |
| | Instagram live | 19 (10.6) | 8 (7.47) | 27 (9.4) | |
| | Facebook live | 0 (0) | 2 (1.8) | 2 (0.7) | |
| Preferences in non interactive platform | YouTube videos | 74 (41.3) | 31 (28.9) | 105 (36.7) | 0.03 |
| | Slide share | 61 (34.0) | 39 (36.4) | 100 (34.9) | |
| | What's app web | 44 (24.5) | 37 (34.5) | 81 (28.3) | |

**Table 2: Perceptions regarding e-learning.**

| Variables | | Female (n1=179) | Male (n2=107) | Total | P value |
|---|---|---|---|---|---|
| Perceived merits of e-learning | Flexible timings, breaks the monotony of classroom teaching, helps in better understanding | 93 (51.9) | 41 (38.3) | 134 (46.8) | 0.1 |
| | Flexible timings | 74 (41.3) | 53 (49.5) | 127 (44.4) | |
| | Breaks the monotony of classroom teaching | 6 (3.3) | 7 (6.5) | 13 (4.5) | |
| | Helps in better understanding | 6 (3.3) | 6 (5.6) | 12 (4.1) | |
| Perceived barriers to e-learning | Lack of personal interaction with the teacher | 110 (61.4) | 70 (65.4) | 180 (62.9) | 0.4 |
| | Access to high speed internet | 44 (24.5) | 23 (21.4) | 67 (23.4) | |
| | Requirement of laptops, mobile or Pcs for accessing the lecture. | 30 (16.7) | 23 (21.4) | 53 (18.5) | |
| | Others | 6 (3.3) | 1(0.9) | 7 (2.4) | |
| Should e-learning be made a part of MBBS curriculum | Indeterminate | 101 (56.2) | 56 (52.3) | 157 (54.8) | 0.1 |
| | Yes | 49 (27.3) | 23 (21.4) | 72 (25.1) | |
| | No | 29 (16.2) | 28 (26.1) | 57 (19.9) | |

In the present study students were questioned for the perceived barriers of e-learning. Majority of the Students, 180 (62.9%) replied that lack of personal interaction with the teacher followed by access to internet 67 (23.4%) and lack of hardware 53 (18.5%) for e-learning were cited as barriers in the e-learning. Other minor barriers perceived by students were lack of specific timings for e-learning and absence of patient contact (Table 2). In the present study, 157 (54.8%) of students were indeterminate whether e-learning should be part of MBBS curriculum while 72 (25.1%) were positive about its inclusion (Table 2)

**DISCUSSION**

The study found that lack of comparable studies at the national level as a major hindrance in drawing meaningful comparisons. In the present study, 34.2% students preferred traditional class room teaching whereas 85% students preferred this method of teaching in a study

conducted by Abbasi et al in Pakistan.[9] In the present study, computer and internet usage skills of only 6.2% of the students were of the advanced level. These are in contrast to the findings of study conducted by Linjawi among dental students in Saudi Arabia which indicated a high readiness level in computer skills among all the students who participated in the study.[10] In the present study 46.8% students listed flexible timings, ease of understanding and absence of monotony as the advantages of e-learning which is similar to findings of the study by Ogunnowo in Nigeria in which 45% of the participants agreed that e-learning assures schedule flexibility.[11] Also in the study done by Popovici and Mironov from Romania found that students were quite certain about the individualized feature of the e-learning but also about its collaborative character and a high-level of autonomy offered by e-learning.[12]

In the present study 48.2% students preferred the blended mode of teaching which is similar to the findings of the study done by Chen in St Cloud state University in USA who found that 49% of the students preferred blended learning.[13]

In the present study 62.9% students opined that lack of personal interaction as a barrier to e-learning which is similar to observations made by Becker et al who found lack of a "personal touch" in comparison to more traditional forms of learning and development as an important barrier in e-learning.[14]

## CONCLUSION

The study identified blended learning as an acceptable method of learning medical curriculum. Schedule flexibility, easy of understanding and absence of monotony of classroom teaching made e-learning more acceptable to the students. Lack of teacher student contact and absence of high-speed internet with hardware were perceived as barriers. These findings should serve as an eye opener to administrators and instructions to make E-learning more inclusive and acceptable to the students.

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