

SHORT ARTICLE

Perceptions About E-Learning Among Undergraduate Medical Students: A Cross Sectional Study

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ABSTRACT

The COVID-19 pandemic times showed the need for blending e-learning in medical education. The current study aims to find the perceptions of undergraduate medical students on e-learning. A questionnaire-based cross-sectional study was conducted on 848 students on perceptions about e-learning. Private college students and Phase IV students significantly faced more data exhaustion. The government college students and phase IV students significantly felt that classes were more monotonous. The longer duration of e-learning caused health effects. Thus, to bring about a better learning environment e-learning can be integrated into the MBBS curriculum as a supplement to bedside and small group learning.

KEYWORDS

E-Learning, Online Learning, Medical Curriculum, Undergraduate Teaching, MBBS

INTRODUCTION

The electronic learning(e-learning) increased in the 21st century with increasing access to the gadgets with internet and the need was also emphasised during the 2020 pandemic.(1) E-learning early is important in medical career as latest health information and research findings, are now available online in HIMS, IDSP, reports and journals.(2,3) E-learning is more engaging by providing 3D representations through artificial

intelligence(AI) or Augmented reality (AR).(4) But the newer components of CBME curriculum like Early Clinical Exposure(ECE), Attitude Ethics and Communication(AETCOM), Small group teaching(SGT) and skill-based learning are yet not compensated by e-learning. The effectiveness of e-learning also depends on quality of delivery tool, experience of educators and administrators.(5,6). Most of the current online assessments are based on multiple-choice questions(MCQ) and there is a

need to develop a comprehensive one. The current study, aims to find the perception of undergraduate medical students about e-learning.

MATERIAL & METHODS

A questionnaire-based cross-sectional study was conducted on a sample of 848 MBBS students (calculated using the formula $4pq/l^2$, $p=67.7\%$ (5), relative error =5%, power = 80%and a non-response =10%). in Tamil Nadu during the pandemic lockdown in 2020. A pre-tested, self-administered questionnaire was circulated to undergraduate medical students through google forms. Data regarding perceptions of e-learning in comparison with offline classes, barriers to e-learning, enabling environment, and assessment methods in e-learning were recorded. Since, it was the pandemic lockdown time, all the students were exposed only to e-learning methods. The responses were recorded in agree-disagree (5-1) Likert scale. Ethical clearance was obtained from the IEC(28/IEC/2020). Informed consent was obtained. Seven responses were excluded from the analysis due to incompleteness or errors. Considering the likert scale scores as quantitative variables scores were compared among type of college and phase of MBBS using unpaired t test and ANOVA respectively.

RESULTS

The analysis was done on responses of 841 MBBS students of which 273 (32.5%) were from government colleges and the remaining were from private colleges. Majority 434(51.6%) were in phase I followed by 169(20.1%), 122(14.5%), and 116(13.8%) in phase II,III and IV of MBBS respectively. *Enabling Environment* About 73.2% felt that classes were disturbed due to network connectivity issues and there was no difference for government vs private colleges or across various phase of MBBS. Private

college students and Phase IV students faced more problems with data exhaustion due to e-classes. The suitability of the home environment for e-learning and the difficulty in accessing a device or internet connection were comparable between the different types of colleges or the phases of MBBS.(Table 1) *Class* The government college students and phase IV students missed ECE and also felt that classes were more monotonous and theoretical than their counterparts. The phase I students and private college students perceived higher workload in electronic classes(e-class). Though there was no difference in the effectiveness of SGT and focused group discussions(FGD) between the types of college, Phase III and IV highly felt that they can be conducted effectively in e-learning also. Students across all the groups did not answer many questions during e-classes and pretended that it was due to some technical issues. The opinion on inadequate breaks during e-classes were also similar across groups. Students from private colleges highly felt that e-learning would affect interpersonal communication and peer learning. Phase I students significantly felt that those who preferred combined or peer learning would be affected due to e-learning. Students of initial phases highly felt that the convenience of e-classes might lead to poor study habits. Phase I students and private college students significantly felt problems like eye strain, headache, backache, and reduced attention span due to online classes.(Table 1) *Assessment* The satisfaction with the time allotted for theory and MCQ tests during the e-learning period and the motivation that regular assignments in e-learning instigated were similar across all groups. The anxiety level regarding exams decreased gradually in the higher phases. Overall students across all groups admitted that they refer to textbooks during online assessments and the mean scores were above 3.5 in all groups. (Table 1)

Table 1 : Showing comparison of online learning across various phases of MBBS students. (N=841)

PARAMETERS	Phase I	Phase II	Phase III	Phase IV	ANOVA	
	M ± SD	M ± SD	M ± SD	M ± SD	F	p value
Classes are disturbed due to recurring network connectivity issues.	4.01 ±0.9	3.94 ±1.0	4.01 ±0.9	4.06 ±0.8	0.40	0.75

PARAMETERS	Phase I	Phase II	Phase III	Phase IV	ANOVA	
	M ± SD	M ± SD	M ± SD	M ± SD	F	p value
Online classes exhaust the daily data limit in a short time	4.20 ±0.9	3.95 ±1.0	4.21 ±0.9	4.25 ±0.9	3.57	0.01
Classes are monotonous	3.90 ±0.8	4.02 ±0.8	4.09 ±0.8	4.31 ±0.7	8.79	<0.01
It is easy to access a computer or internet connection even in spite of diverse socioeconomic backgrounds and locality	4.19 ±0.8	4.19 ±0.9	4.25 ±0.9	4.28 ±0.9	0.24	0.86
The time allotted for MCQs and theory exams is sufficient.	3.07 ±1.1	2.89 ±1.0	3.02 ±1.2	3.11 ±1.1	1.30	0.27
Daily/weekly online assignments and tests keep us enthusiastic to learn concepts.	2.94 ±1.2	3.08 ±1.23	3.11 ±1.1	3.22 ±1.2	2.06	0.10
The workload of online classes is larger than regular lecture classes.	3.74 ±1.1	3.62 ±1.1	3.21 ±1.2	3.60 ±1.1	6.83	<0.01
Online classes are completely theoretical and there is no chance to train in hands-on skill-based concepts.	4.21 ±0.6	4.37 ±0.7	4.41 ±0.9	4.59 ±0.6	11.4	<0.01
I miss the ECE sessions which imparted better patient interaction, and basic science correlation	4.22 ±0.8	4.47 ±0.8	4.43 ±0.9	4.65 ±0.6	9.88	<0.01
SGT sessions and FGD can be conducted during online sessions effectively.	3.23 ±1.1	3.52 ±1.0	3.61 ±1.0	3.54 ±1.1	6.14	<0.01
I am anxious to know the exam date	4.49 ±0.8	4.45 ±0.7	4.35 ±0.9	4.26 ±0.7	3.04	0.02
I find my home environment suitable for e-learning.	3.08 ±1.2	2.91 ±1.3	3.02 ±1.3	3.04 ±1.2	0.76	0.51
Many times, I have not answered the queries posed by faculty and pretended as if, I had some online issues or improper mike connection	3.19 ±1.2	3.28 ±1.2	3.28 ±1.2	3.23 ±1.2	0.31	0.81
My knowledge and skills regarding online learning tools and platforms had been enhanced.	2.51 ±1.0	2.29 ±1.1	2.40 ±0.9	2.44 ±0.9	2.04	0.10
Lack of socialization with teachers, peers and friends	4.28 ±0.7	4.12 ±0.7	4.15 ±0.7	4.18 ±0.7	2.60	0.05
Students who have practiced combine studies and academic discussion with peer may struggle a lot.	4.30 ±0.7	4.24 ±0.8	4.17 ±0.8	4.00 ±0.9	4.20	0.006
Switching off the cameras and microphones make the learners passive.	3.83 ±1.0	4.04 ±0.9	3.92 ±0.9	3.72 ±0.9	2.34	0.07
Break in between sessions are not adequate during online teaching	3.65 ±1.1	3.72 ±1.0	3.60 ±1.1	3.60 ±1.1	0.39	0.75
The faculty has to allow late comers to attend the class on the view of internet issues	4.32 ±0.7	4.26 ±0.9	4.32 ±0.7	3.96 ±0.9	6.96	<0.01
The convenience of online classes might impart less motivation to study leading to poor study habits.	4.33±0.9	4.33±0.9	4.27±0.9	3.93±1.1	5.86	0.001
Classes makes me sleep	3.92±0.9	4.08±0.8	3.87±0.9	3.48±1.0	10.34	<0.01
Due to lack of supervision, I cannot resist myself from referring the text books during online assessments.	3.67±1.0	3.91±1.0	3.73±0.9	3.50±1.1	3.72	0.01
I frequently suffer from eye strains, dry eyes, headache, and back pain due to sitting and watching the mobile/ computer screens for longer time.	4.31±0.9	4.10±1.0	4.20±0.9	4.02±1.0	3.75	0.01
My Attention span is reduced significantly when compared to an offline class	4.36±0.9	4.30±0.9	4.16±0.8	3.77±1.1	12.69	<0.01

CONCLUSION

Despite being equally satisfied with the enabling environment for e-learning, the government students felt that classes were more monotonous and theoretical than their counterparts. The classes being more theoretical by themselves can present with monotony. But the difference might also be due to the availability of technical resources across these colleges as evidenced by high data consumption and workload among private students and should be addressed with standardized curriculum for e-learning. The voluminous portions in phase IV along with lack of bedside teaching might be the reason for monotonous classes inspite of high data consumption. With evidence NMC, had put forth, competency-based teaching for more learner engagement.(7,8) In accordance, the current study also showed that students in the CBME curriculum(Phase I and II) did not feel that e-learning was monotonous and theoretical and also felt e-classes could not compensate for SGT and FGD of offline mode. As most students in the current report have admitted that they referred to textbooks during online assessments, it implies the need for developing a robust theory assessment technique and the role of online proctoring currently used for MCQ tests can be explored.(9,10) Due to forced and exclusive e-learning in the study period(pandemic 2020), the comparison with offline was done across different time lines. Moreover the comparison was against a mixed group in which a part were exposed to CBME method. Hence the findings should be generalised with caution. Though e-learning is beneficial in MBBS it might also come with health limitations in long course which need to be addressed through training in screen time, sitting posture, etc. Though the experience of bedside clinical learning could not be brought out effectively, in e-learning advanced utilization with e-simulation, demonstration videos, and AR/AI techniques might overcome this lacuna. The study also highlights that online assessments need to be planned with better scrutiny. In the current era where e-learning is preferred by students

globally, assessment of its adaptability into medical curriculum and students perception will help to develop a strong curriculum.

AUTHORS CONTRIBUTION

All authors have contributed equally.

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CONFLICT OF INTEREST

There are no conflicts of interest.

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