



Students' Perception Towards E- Learning as an Education Tool with an Emphasis on Anatomy Learning in A South Indian Medical College

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Abstract

Background: Medical schools all over the world have been attempting to change pedagogy by reducing lectures, utilizing technology to replace or supplement the learning and promoting for individualized education. An integrated competency-based medical education (CBME) curriculum has replaced the traditional curriculum in the Indian medical education system with various improvements in the teaching and learning style, which largely emphasizes on active student-centered learning through case-based teaching, small group discussions and tutorials. The aim of this transition is to develop student's critical thinking, problem-solving skills, and self-directed learning skills. To build these abilities, it is essential to use internet and technology during the sessions. NMC of India has stated the significance of E-learning in it as- "Lifelong learner committed to continuous improvement of skills and knowledge and made online learning and assessment to be a part of the new MBBS curriculum. Despite this transformation, many Indian medical institutions are still not

permitting electronic devices in the classrooms and students are not having access to internet during the lecture time. The present study is conducted to analyze the students' attitude towards E-learning and their perception to supplement conventional teaching with digital learning. **Methods:** A pre-designed Likert Scale questionnaire was shared to the nursing and MBBS students. The SPSS 20 was used to analyze the data. **Results:** Students expressed a positive response and had a greater comprehension of anatomy by learning mostly through You Tube and Complete anatomy apps. **Conclusion:** Indian medical education must keep up with the technology's rapid advancement. The current investigation demonstrated an inclination to adopt this system as a supplement to the traditional method. This enables the Indian medical schools to decide on making E-learning as a mandatory part of medical education for an innovative learning and assessment.

Keywords: E-learning, CBME curriculum, life-long learner.

Introduction: The term "E-learning" indicates the advancement in knowledge and performance in the classroom and assessments with the use of computer and Internet technologies [1]. The United Nations (UN) and the WHO consider E-learning as an aiding tool in addressing education needs in health care, especially in developing countries [2,3].

The advancement of medical education around the globe was successfully accomplished by integrating E-learning into traditional teaching for the benefit of the pupils [4]. In 2019, Indian medical education system has transformed from a traditional curriculum to an integrated competency based undergraduate (CBME) curriculum. This outcome-based curriculum majorly focuses on active student-centered learning and emphasizes on the student's capability to enhance critical thinking, problem-solving skills and self-directed learning skills. To build these abilities, it is crucial to use internet and technology during the sessions. NMC of India released a module on online learning and assessment to be a part of the new MBBS curriculum and stated the significance of E-learning in the curriculum as- "Lifelong learner committed to continuous improvement of skills and knowledge [5]. These modifications indicate the precedence of integrating digital learning as an aid to conventional teaching. Because of the extensive, overburdened syllabus and lack of time, it is essential to create a blended learning system to assist the students in achieving the objective of continual professional growth [6]. This will also create an opportunity for underprivileged medical colleges to collaborate with schools providing top-notch medical education [7].

Although Covid 19 revolutionized pedagogy methods while in lockdown, Indian colleges continue to use the traditional mode of instruction, and most medical institutions have not yet adopted the use of internet for educational purposes. It is noted that relatively few studies on students' perceptions of online learning in Indian professional institutions have been carried out. Among them, most of the studies were on the perception of online classes during covid 19 lockdown [8,9,10,11].

Few academics have examined the perceptions of Indian medical students regarding the addition of online learning to their traditional classroom instruction and received a positive attitude [12,13,14]. In a narrative review by Dhir SK, it is indicated that the students and faculty are mostly in favor of adopting e-learning hand-in-hand with traditional learning [15]. Few educators have surveyed health care professionals' perception on E-learning in India. One such study concluded the feasibility of incorporating E-learning as a part of the training process of healthcare workers in India [16]. Few more studies on nursing students and other professional college students in India depicted the readiness to adopt E-learning and recognize its uses in education [17,18].

According to every prior study, students are in favor of web-enhanced curricula. Hence, the current study was undertaken among medical and nursing undergraduates with the aim to

examine their attitudes, needs and perception towards E-learning and to assess its scope for future use of a blended learning curriculum.

Methods

A pre-designed and pre-validated structured questionnaire was adopted from a previous study [17,19]. Upon submission of consent forms, the questionnaire was shared via electronic media such as email or WhatsApp. The variables included in this study were gender, course enrolled, year of study, perception of E-learning education and the most preferred application to learn anatomy. The final edited questionnaire included five domains for the perception of E-learning with a total of 28 elements. Out of 28 elements, 14 are positive and 14 are negative. All the elements were scored according to a 5-point Likert scale, ranging from strongly agree to strongly disagree.

For positive elements, score of 5 was given for strongly agree, 4 for agree, 3 for neither agree nor disagree, 2 for disagree and 1 for strongly disagree. On the contrary for negative elements, score of 1 was given for strongly agree, 2 for agree, 3 for neither agree nor disagree 4 for disagree and 5 for strongly disagree. A higher score for evaluation purposes implies that the student views electronic learning favorably, whereas a lower score suggests a less positive impression.

The SPSS 20 was used to analyze the data. For the participants' gender and year, frequencies and percentages were determined. A pie chart showed the frequency of the applications used to learn anatomy. For the Likert responses, mean and Standard deviation were determined.

Results

Total 164 students participated in the study with 41 males and 123 females. There were 111 MBBS students and 52 nursing students. Among 164 participated, majority of the participants are from year 1 (125 students) and 158 students had smart phones. The overall results are depicted in Table 1.

Table 1: Perception of E-learning

	N	Mean	Std. Deviation
Perceived usefulness	164	3.6351	.39924
Intention to adopt	159	3.5167	.70126
Ease of learning and technical support	158	3.1823	.58880
E-learning as stressor	158	2.4557	.77043
Distant use of E-learning	158	3.7848	.77658
Valid N (listwise)	158		

Perceived usefulness

The overall mean for this domain is 3.63. The mean values of individual elements of this domain are represented in Table 2. Majority of the students with the mean score of 4.18 perceived that E-learning can solve many problems of education. More than 80 percent of students found that the digital learning has improved their access to learning material and helped achieve better results by saving time. With the mean score of 4.07, most of the students had a better understanding of the concepts. Eighty six percent students reported that their engagement in learning has enhanced. 75 percent of them believed that their knowledge is reinforced with internet education, while 85% with the mean value of 4.06 had utilized this method to catch up missing lectures. Eighty three percent students agree with the mean score of 4.19, that the universities should adopt more and more E-learning for their students. However, thirty six percent disagree that learning through technology is as good as teacher, while sixteen percent thinks that E-learning has created more problems than it has solved.

Table 2: Perceived usefulness

	N	Mean	Std. Deviation
E-Learning can solve many of the educational problems	163	4.18	.608
E-Learning saves time	163	4.04	.666
E-Learning improves access to learning material	163	4.13	.610
E-Learning help me to achieve better results	163	3.92	.703
E-Learning increase learner's engagement in learning	163	3.83	.782
E-Learning increases my understanding of concepts	163	4.07	.663
E-Learning improves teacher and student interaction	161	3.23	1.068
*E-Learning has created more problems than it solves	161	2.88	.977
*E-Learning is too time consuming to use	161	3.20	.954
*E-Learning has had little impact on me	160	2.63	1.007
E-Learning is as informative as the teacher	160	3.69	.884
*E-Learning will never replace other forms of teaching and learning	160	2.62	1.032
E-Learning helps to reinforce my knowledge	159	3.91	.669
E-Learning helps me to catch up missing lectures	159	4.06	.700
Universities should adopt E-Learning for students	159	3.89	.771
Valid N (listwise)	158		

* Negative question

Intention to adopt

Most of the pupils disagreed that E-learning is uncomfortable and not in favor of it. With the mean value of 3.63, sixty five percent students had fun during their learning process with the digital media. Overall mean for students' intention to adopt e-learning is 3.51, with the various elements depicted in Table 3.

Table 3: Intention to adopt

	N	Mean	Std. Deviation
*E-Learning makes me uncomfortable because I don't understand it	159	3.42	.990
*I dislike the idea of E-Learning	158	3.55	.981
*I am not in favor of E-Learning	159	3.50	.993
*E-Learning doesn't interest me	159	3.48	.940
Using E-Learning make learning fun	158	3.63	.870
Valid N (listwise)	157		

* Negative question

Ease of learning and technical support

With the mean of 3.53, students disagreed with that E-learning is more difficult than library. However, 48. 5% students believed that they are becoming slaves to technology, while 29.6 percent considered that internet is making them slow. While students found ease and fun in learning, only 48.5 % (mean 3.26) students mentioned that the institution has adequate technology for this method of learning. The mean scores are demonstrated in Table 4.

Table 4: Ease of learning and technical support

	N	Mean	Std. Deviation
*Using E-Learning is more difficult than using the library	158	3.53	.962
*I can't learn courses through the web	158	3.37	.980

*I find that using the internet make me slow	158	3.10	.992
*I feel we are becoming slaves to technology	158	2.65	1.003
My institute has adequate technology for E-Learning	157	3.26	1.039
Valid N (listwise)	157		

* Negative question

E-Learning as Stressor

Majority of the students with the mean value of 2.60 has admitted that they lack the ability to use internet. Moreover, the speed of internet is a limitation (mean score 2.31) for 67.8% students. Overall mean for e-learning stressor is 2.45. (Table 5)

Table 5: E learning as stressor

	N	Mean	Std. Deviation
*I feel anxious about my ability to use E-Learning effectively	158	2.60	.944
*Slow internet connections stress me	158	2.31	.970
Valid N (listwise)	158		

* Negative question

Distant Use of E- learning

More than seventy percent of the pupils agreed that online education should be offered to remote areas. The mean score for this domain is 3.78.

Most preferred application for anatomy

The pie chart depicting the most preferred app and search engines for anatomy is shown in Figure 1. Among 164 MBBS and nursing students, 76 students have taken the help of You tube for learning. The second frequently used complete anatomy (18.35%) for a better understanding of the topics. 8.86 % of the students watched Dr. Nazib lectures to clarify their doubts. 12 students found visual anatomy app as a helpful tool for anatomy. The fifth common search engines are Kenhub and teach me anatomy, with VH dissector and Osmosis being the last preferred items.

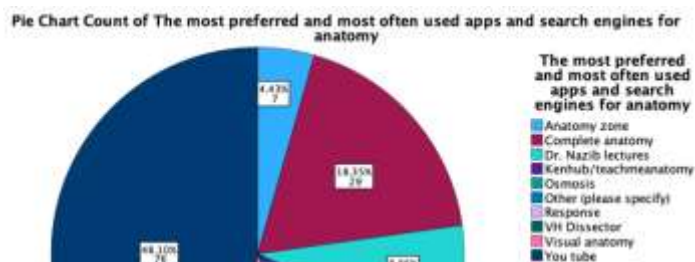


Figure 1

Discussion

Medical schools all over the world have been attempting to change pedagogy by reducing lectures, utilizing technology to replace or supplement the learning, implementing team-facilitated, active self-directed learning, and promoting for individualized education. Several

studies in different parts of the world endorses the use of technology in professional colleges. Despite this transformation, many Indian medical institutions are still not permitting electronic devices in the classrooms and students are not having access to internet during the lecture time. Medical professionals are required to evolve with rapidly growing technology. Embracing the technology in traditional education system plays a significant role in the development of certain skills in the medical students that helps in life-long learning process. According to published research, adding digital learning and assessment to conventional instruction may help medical students learn more effectively. The present study on perception of medical and allied health students on E-learning is the first study to be conducted in South India and it will provide information to the medical schools to adopt necessary methods that meets the requirements of new CBME curriculum.

In the current study, students attending the medical school demonstrated a positive attitude towards perception of usefulness of E-learning with a mean score of 3.63. 84.8 % pupils agreed that internet learning helped for a better understanding. Similar results were observed in the study conducted in a medical college in hilly region and another study with 70% and 90.68% of agreement respectively [20,13]. Moreover, a study on nursing students showed 72.2 % likeliness [17]. The students in India most of the times hesitate and attain less marks than expected due to unclarified concepts. In the study conducted by Bhat GM et.al, the students scored better results with blended teaching compared to traditional white board teaching with [8]. Similar results were depicted in the current study. Majority of the students in other studies are ready to have E-learning as a supplement to traditional learning [13,14,17,20]. Likewise in the present study, 74% of the students are ready to adopt it as most of them found this way of learning captivating.

With the modification of curriculum structure by NMC, online learning has become a part of teaching and assessment which requires good internet connection. However, one drawback of digital education system is poor connectivity issues that was agreed even by our students by 68.8% which stressed them during learning process.

Literature survey stated that medical education and research will not be effective unless ICT tools and techniques are used in the educational process [21]. Online assessment methods are being used in other countries which makes it interesting and willing to participate. Moreover, assessing the students at the end of lectures by various apps helps immediate analysis of student's perception of concept. Incorporating audio-visual aids during instruction can help maintain interest. YouTube dissection videos and narrative-driven Power Point presentations appear to be popular among students. They learn difficult topics and ideas more quickly by watching animation. 48.1% of the students in our study used YouTube as the most common E-source for learning. In couple of studies, students had a clear concept, especially in anatomy with the help of applications and websites [17,22].

Conclusion

Indian medical education must keep up with the technology's rapid advancement. E-learning makes a significant contribution to the new competency-based system by ensuring optimal educational quality, communication skills, critical thinking, and self-learning capacities not only for medical but also for nursing graduates. However, technology has not been fully incorporated in the nation's medical education system. The current investigation on Indian medical and nursing students demonstrated a favoring attitude towards E- learning and the readiness to embrace this system as a supplement to the traditional method. This enables the Indian medical schools to decide on making digital methods of teaching as a mandatory part of medical education for an innovative learning and assessment and assisting the pupil's life-long learning.

List of abbreviations: CBME- competency based medical education, NMC- National medical council, ICT- Information computer technology.

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