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E-Learning - A Boon or A Bane, For Undergraduate Medical Students: A Cross-Sectional Study in Bangalore.

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ABSTRACT

The study aims at analyzing the perception of students about e-learning platforms - its benefits and challenges. The study tries to assess awareness about E-learning platforms among medical undergraduates, its usage and opinion on E-learning platforms. The analysis was carried out using data collected through structured questionnaires for Undergraduate medical students in Bangalore through google forms. The results were analyzed by using descriptive statistics. The study reveals that majority of the students are aware of e-learning platforms and most of them using it are satisfied with their academic performance compared to the non-users. It was also found out that majority of them prefer online teaching modalities compared to offline although the major disadvantage of it being the lack of clinical practice/hands on experience
Keywords: E-learning platforms, students, perception, advantages, challenges, satisfaction.

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INTRODUCTION

In this fast-moving world of technology, there is a need for the education system to keep up with this pace in order to enhance the quantity of knowledge delivery. E-learning is one such method that is currently gaining popularity among the undergraduate medical students. E-learning is an umbrella term that is used to describe a wide variety of electronic ways that enable access to education and the process itself. These include: Virtual classrooms, video and audio recordings, YouTube, Marrow, Prepladder, Unacademy etc. The last decade transformed e-learning radically. In the early days, courses offered for e-learning were typically custom created, by groups of programmers who were aided by software creating tools. Advancement in technology led to the creation of worldwide web, making the creation of e-learning courses a simpler task, that anyone without programming knowledge could complete.

Changes in technology brought new hardware like portable computers, which made it very easy for learners to access course material online. Today, many people are using tablets and smart-phones for online classes and web seminars or webinars [1].

Over the last decade, technological advancements have taken place in the field of e-learning. These include the application of information and communications technology (ICT) in classrooms and the use of cloud-based platforms, virtual reality (VR), and augmented reality (AR). The e-learning market in India was valued at INR 91.41 Bn in 2020. It is expected to reach a value of INR 312.13 Bn by 2026, expanding at a compound annual growth rate (CAGR) of ~17.60% during the 2021 – 2026 period [2].

In the wake of the pandemic, in-person classes were stopped to curb the spread of the virus. However, it was not expected that it would have such a lasting effect. Institutions are adopting e-learning methods and shifting to online classes so that learning can continue. The demand for academic books dropped by 40%- 50% because of the closure of educational institutions [2].

Objectives

- To assess awareness about E-learning platforms among medical undergraduates
- To assess Usage and opinion on E-learning platforms

MATERIALS AND METHODS

Study designs and setting

A cross-sectional study design is adopted to identify the advantages and disadvantages of using e-learning by undergraduate medical students. This study is carried out in universities across Bangalore.

Population and Sampling

University students in Bangalore have been considered as population for this study. The study population includes second year, third year, fourth year students and Interns. The first-year students were excluded from inclusion criteria, the reason for it being is that lack of knowledge regarding proper use of these platforms. None of the faculty staff was considered as a part of the study.

Materials

The research instrument consists of two sections. The first section is related to demographical variables such as e-mail, name, gender and academic year (undergraduates and interns). The second section measures factors – knowledge about e-learning platforms, its usage, its comparison with traditional learning, course design, students' expectation, satisfaction and performance. Only students from south India had taken part in this survey. A total of twenty- seven questions were asked in the study to check the effect of the above variables on students' satisfaction and performance.

RESULTS

Overall, 60.8% (n=124) of respondents were females as seen in Table 1. Most of the respondents were in the third year, 95 (46.5%), and the main characteristics are illustrated in Table 2.

99% of the students responded that they were aware of e-learning platforms (YouTube, Marrow, Prepladder, Unacademy, Moksh and others). Table 3. The respondents gained a fair amount of knowledge regarding e-learning platforms from friends, online, advertisements, newspapers and others (38% [n=164] , 30.09% [n=127], 21.09%[n=89], 5.2% [n=22] and 4.7% [n=20] respectively). Table 4. With 91% students have experience with using these platforms.

Overall, out of all the respondents who use e-learning platforms, 41% (n=170) used YouTube, 31% (n=130) used marrow and the remaining constituting other platforms as shown in Table7.

Reason for no usage of these platforms by rest of the respondents was found out to be cost ineffective 30% (n=16), uncomfortable with using gadgets 22% (n=12), lack of motivation 20% (n=11) and other reasons. Table 8. Most of the respondents use the unpaid version for the same reason 70% (n=144).

While assessing the attitude of students towards e-learning, it was found out that majority (71%) agree that all topics from standard books are better covered online than offline with majority (64%) of them being able to utilize their study time efficiently through online modalities with most having "moderate responsibilities" (Table 18).

On comparison of e-learning with offline modes of teaching, following were found to be the advantages: Being able to rewatch 27.6% (n=159), can learn in their own pace 27.4% (n=158), pause and take notes 22% (n=130) and other pros Table 12.

The respondents find e-learning effective because the lectures are clearer 59% (n=121), availability of PPTs 33% (n=68), and better doubt clearing 7% (n=15) with majority 75% (n=154), of them finding online assessment methods more effective (55%) [Table 23], reason being: statistical analysis on weak areas 55% (n=135), easier feedback 30% (n=73) and others 14% (n=35), Table 15.

Challenges faced by the respondents include, 21.24% (n=545), experienced poor Internet speed, 21.75% (n=512) reported a lack of clinical experience and physical examination skills and lack of concentration (15%) -reasons for it shown in Table 21. Table 16 presents the results for the remaining challenges.

75% of the students find online teaching cheaper than offline and majority (47%) find quality of student-teacher interaction in online teaching "somewhat satisfactory".

Most of the respondents remain "neutral" towards feeling active and confident through online assessment. The remaining responses are shown in Table 24

Majority (65%) of the students gain better clinical knowledge and experience through offline than online [Table 25].

For the students who agreed to have gained better clinical knowledge through online, majority is for being able to replay 36% (n=59), and pause it 30% (n=50). Other reasons shown in Table 26

For the students who agreed to have gained better clinical knowledge through offline, majority is for hands on experience 49% (n=126), and being able to clear doubts in real time 30% (n=78). Other reasons shown in Table 27.

Overall, majority (73%) of the students are satisfied with their academic performance after using e-learning platforms according to Table 28, and the percentage measure of their satisfaction is depicted in Table 29.

Table 1-5. Demographic characteristics and knowledge on e-learning platforms.

Characters	Frequency	Percentage
1. Gender		
Male	80	39.2
Female	124	60.8
2. Year of study		
2nd	51	25
3rd	95	46.56862745
4th	40	19.60784314
Interns	18	8.823529412
3. Awareness		
Yes	202	99.01960784
No	2	0.980392157
4. Source of awareness		
Friends	164	38.86255924
Online	127	30.09478673
Advertisements	89	21.09004739
Newspapers	22	5.213270142
Others	20	4.739336493
5. Knowledge		
Yes	175	85.78431373
No	29	14.21568627

Table 6- 12 Experience and efficiency of the platforms

	Frequency	Percentage
6. Experience		
Yes	186	91.17647059
No	18	8.823529412
7. If yes , what platforms used		
YouTube	170	41.76904177
Prepladder	38	9.336609337
Marrow	130	31.94103194
Un academy	28	6.87960688
Others (Moksh academy, Digi nerve etc)	41	10.07371007
8. If no , what are reasons		
Not comfortable using gadgets	12	22.64150943
Network? Technical issues	7	13.20754717
Expensive	16	30.18867925
No motivation	11	20.75471698
Other	7	13.20754717
9. Paid / Unpaid		
Paid	144	70.58823529
Unpaid	60	29.41176471
10. Efficient use of study time through them		
Yes	64	31.37254902
No	40	19.60784314
Somewhat	100	49.01960784
11. Topics covered from standard books		
Yes	146	71.56862745
No	58	28.43137255
12. Why is E-learning better than offline		
I can rewatch the videos	159	27.65217391
Cost effective	49	8.52173913
I don't have to commute	79	13.73913043

Can pause the video so better for taking notes	130	22.60869565
I can learn at my own pace	158	27.47826087

Table 13-28: Effectiveness and problems faced in usage of e-learning platforms

13. Why is e-learning effective		
Every student can hear lecture clearly	121	59.31372549
PPTs are easily available to everyone	68	33.33333333
Can ask doubts without any reservation	15	7.352941176
14. Better progress tracking and assessment than offline		
Yes	154	75.49019608
No	50	24.50980392
15. Why is assessment and progress tracking efficient in e-learning platforms		
It gives statistical analysis on weak areas	135	55.55555556
Easier feedback	73	30.04115226
Others	35	14.40329218
16. Issues faced while using e-learning platforms		
Internet issues	126	21.24789207
technical issues	46	7.757166948
Inability to concentrate	90	15.17706577
lack of feedback	46	7.757166948
Lack of clinical and physical examination skills	129	21.75379427
Expensive	106	17.87521079
Lack of access wit username and password	22	3.70994941
Poor faculty	22	3.70994941
Others	6	1.011804384
17. How often do you internet issues		
all the time	6	2.941176471
often	26	12.74509804
sometimes	102	50
rarely	58	28.43137255
never	12	5.882352941

18. Time and responsibilities		
no responsibilities and enough time	28	13.7254902
moderate responsibilities and sufficient time	141	69.11764706
many responsibilities and no / little time	35	17.15686275
19. Online learning is cheaper than going to campus		
Yes	154	75.49019608
No	50	24.50980392
20. Quality of interaction between students and faculty		
satisfactory	52	25.49019608
Somewhat satisfactory	97	47.54901961
Not satisfactory	55	26.96078431
21. Reasons for lack of concentration		
social media	149	33.11111111
disturbance at home	58	12.88888889

No compulsion for learning	112	24.88888889
Digital eye strain	127	28.22222222
Other	4	0.888888889
22. High quality learning with/without face-to-face interaction		
Strongly agree	18	8.823529412
Agree	52	25.49019608
Neutral	72	35.29411765
Disagree	48	23.52941176
Strongly disagree	14	6.862745098
Strongly agree	18	8.823529412
23. More effective type of assessment		
Traditional (written test offline)	85	41.66666667
Online (MCQs)	119	58.33333333
24. I feel active and confident with online learning		
Strongly agree	20	9.803921569
Agree	73	35.78431373
Neutral	84	41.17647059
Disagree	16	7.843137255
Strongly disagree	11	5.392156863

25. Better clinical knowledge through online modes than offline ones		
Yes	70	34.31372549
No	134	65.68627451
26. Reasons for getting better clinical knowledge through online modes		
Qualified faculty	47	28.83435583
Pause it and take notes	50	30.67484663
Replay it for reference	59	36.19631902
Other	7	4.294478528
27. Reasons for not getting better clinical knowledge through online modes		
No hands-on experience	126	49.80237154
Faculty	45	17.78656126
Clear doubts in real time	78	30.83003953
Others	4	1.581027668
28. Are you satisfied with academic performance after using e-learning platforms		
Yes	150	73.52941176
No	54	26.47058824

DISCUSSION

Our study demonstrated that 99% of the students are aware about e-learning platforms mostly through friends and advertisements online. This is similar to research by Sud et al, which demonstrated that majority (85%) of the students know about e-learning tools. However, this in contrast to the report from Brazil where Carvalho et al found that students in public universities do not know about e-learning and that was due to lack of resources. According to our study 91% of the students have experience using e-learning platforms of which most of them use YouTube and Marrow and the remaining 9% of the students don't use the e-learning platforms for reasons such as uncomfortable with using gadgets, expensive, no motivation and technical issues.

Digitalization of course material can help medical students overcome limitations posed by traditional learning. However, e-learning presents unique challenges such as poor internet speed reported by Amir et al and Sud et al further studies reported lack of clinical experience or physical examination [3].

Our study adds on to the impact of cost on usage of e-learning platforms where majority of the students have used the unpaid version.

The advantages of using e-learning platforms over traditional learning was found out to be the ability to rewatch videos, pause and take down notes , being able to learn at their own pace, effective

learning and more efficient progress tracking through statistical analysis which is not provided in offline classes. On the contrary, majority of the challenges faced in e-learning was contributed by lack of hands on experience, Internet issues, expensive and distractions like social media, no compulsion for learning, disturbance at home and eye strain. However, despite the challenges and responsibilities, majority of students feel more confident and satisfied with their academic performance after usage of e-learning platforms.

Alghizzawi et al. identified some of the major advantages of e-learning, as it delivers education in the virtual environment by the inclusion of different devices. Araujo junior and Marquesi for the adult that e-learning methods such as LMS help in enabling a synchronized communication, by promoting the use of different strategies while promoting students' active participation. In relation to the assessment methods employed in e-learning systems, Rahrouh, Taleb & Mohamed added that LMS in general has been effective, usable, efficient, manageable, and reliable. The respondents further showed a positive attitude towards the use of LMS and its effectiveness in students' assessment. While, Yilmaz identified some of the commonly used techniques in the online assessment of students in virtual learning. According to the study, the commonly used methods include; multiple choice questions, open ended questions, short answer questions, true and false statements related exercises. The researchers further examined that online exams include assignments. Upon examining the lecturer's opinion and alternative techniques of students' performance assessment, it was observed that majority of the lecturer's follow latest developed trends in evaluation and assessment of student's performance. In addition, the respondents further favoured the use of student-cantered evaluation techniques [4].

However, there are limitations to this study that limit the inferences that can be drawn from the data. First, the participants were mostly from universities across Bangalore. This is an inherent weakness because the participation was restricted to undergraduate medical students. Second, differences in learning experiences vary between countries as students are also different, and this could limit the inferences. Third, our study does not measure academic performance changes before and after the transition to e-learning. Additionally, there was no control group, and comparing test scores between two different semesters can imply different topics were assessed.

As this study presents students' views and challenges, perhaps the next step is to focus on the faculties to understand their views, needs, and skills for implementing digital education. World-class medical education experts' webinars should be conducted to explore more options and motivate students and faculties.

Future research could address the availability of funding to invest in infrastructure, e-learning modalities, learning materials, quality, information management systems, support, and resources. Further, partnerships with international expertise for continuous improvement to fill the gaps in education systems and create personalized learning programs. The digital revolution needs the collaboration of expertise in IT, educators, and private organizations to build a state-of-the-art platform to connect students, teachers, and devices effectively. As the sample size is small in many studies, future research could focus on the reliability of e-learning by using larger sample sizes and explore if artificial intelligence could be incorporated in digital education [3].

CONCLUSION

E-learning is booming as a popular educational tool and if employed in an appropriate manner, it can improve educational yield of medical students across the world and reduce the burden on teachers and clinicians. Future studies should focus on the reliability of e-learning platforms and perception of faculty and conventional education systems . The aim of this study is to assess the advantages and disadvantages of e-learning platforms to medical students which will in turn reflect on the quality of education received by them through it. The basis of this research would be to collaborate with policy makers, medical educators and telecommunication companies to incorporate e-learning in order to overcome the challenges posed by traditional teaching methods and also to address the shortcomings of e-learning platforms by improving their infrastructure.

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