Original Article

Online classes versus traditional classes? Comparison during COVID-19

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Abstract:

BACKGROUND: Nowadays, the use of Internet with e-learning resources anytime and anywhere leads to interaction possibilities among teachers and students from different parts of the world. It is becoming increasingly pertinent that we exploit the Internet technologies to achieve the most benefits in the education.

MATERIALS AND METHODS: This study compares the difference between traditional classroom and e-learning in the educational environment. Medical undergraduate students of our institution were enrolled to compare between the online versus traditional method of teaching through questionnaire.

RESULTS: Forty percent of students found the online lecture material difficult to understand. 42.6% of respondents found it difficult to clear the doubts in online teaching; 64.4% of the participants believed that they have learned more in a face-to-face learning.

CONCLUSION: In this study, we concluded that online mode offers flexibility on timing and delivery. Students can even download the content, notes, and assignment. Despite all the advantages offered, there is a general consensus that no technology can replace face-to-face teaching in real because in this, there will be visual as well as verbal discussion. Looking at the uncertainty of the current scenario, it is difficult to predict how long online classes will have to continue. Hence, it is of paramount importance that we assess the effectiveness of online classes and consequently take measures to ensure proper delivery of content to students, especially in a skilled field like medicine, so we concluded that face-to-face learning is of utmost importance in medical institutions.

Keywords:

COVID-19, higher education, learning effectiveness, medical students, online interaction, online teaching

Introduction

In these current times of information technology, students in higher education depend on a computer to do most of the work. Most higher educational institutions are also aware that using network technology can create, foster, deliver, and facilitate learning and enhance students' experience and knowledge. Hence, the rapid developments and growth of information and communication technology have had a profound influence on higher education. E-learning means that teachers and students perform and complete the task through Internet, a method that is relatively different from traditional classroom.[1] According to a report published in 2011, over 6.1 million students were taking at least one or more online courses in 2010, with 31% of all students involved in higher education being taking at least one online course. In a more recent report, the number had increased by approximately 570,000 for a total of million students taking at least one or more online course. The report further shows and predicts that the number of students taking at least one online course is at its highest level, with the current growth rate of 9.3%, and shows no evidence of the trend slowing in the foreseeable future.[2] This trend has left many questions that need to be answered

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regarding what factors are driving this shift and how this shift will ultimately affect institutions across the country.

The history of online learning is particularly interesting because it not only shows the contributions of individuals but also institutions to the advancement of education and the sharing of that knowledge and skills on a global scale. As we briefly review the historical development of this subject, it is important to indicate that many authors use the terms "distance learning," "distance education," "online learning," and "online education" interchangeably,[3] as is the case in this paper.

Online courses are courses where at least 80% of the content is delivered online without face-to-face meetings, whereas face-to-face instructions are a learning method where all content is delivered only in a traditional face-to-face setting.

Hybrid courses, on the other hand, combine the benefits of face-to-face learning with the technology often used in online courses. 30%–79% of the course is delivered online.

Web-facilitated courses are the ones where 1%–29% of the course is delivered online. Although this type of course is actually a face-to-face course, it uses a web-based technology to supplement the face-to-face instruction provided to students.

This study is to compare the effectiveness of a medical undergraduate, online microbiology course to a traditional in-class lecture course taught by the same instructor as measured by response to the pre-formed questionnaire.

Materials and Methods

Study design and setting
It was a prospective study. Study participants were provided with a questionnaire to do comparison between the online versus traditional method of education. Due to COVID-19 pandemic restrictions, traditional classroom teaching was shifted to online teaching. In traditional classroom setting, lecture duration ranged typically from 45 min to 1 h, with few minutes dedicated for doubt clearing or discussion at the end. Course content was delivered by the faculty verbally, assisted by projected PowerPoint presentations. In contrast to this, course content in online mode was delivered through streaming/video-conferencing software. Students could access it through their electronic devices: phones, tablets, and laptops via a link. The content for both educational modes—online and traditional classroom-based—was identical as it was taught by the same teaching faculty. Duration of lectures remained the same as well.

Study participants and sampling
Medical undergraduate students at the Department of Microbiology, All India Institute of Medical Sciences, New Delhi, India, were the study participants. Students were the same for both modes of teaching. Out of a total strength of 101, 75 students participated.

Data collection tool and technique
A questionnaire was designed covering questions such as whether online classes provide better understanding of course content, is it easier to pay attention to lectures in online classes, whether online classes are convenient to attend, is it easier to clear doubts through online discussions, do the students face technical issues during online classes, are the students more likely to attend online classes than traditional classes, is it easier to get distracted during online classes than during traditional classes, are the students more likely to stick to the time table of traditional classes as compared to online classes, do the students miss social interaction with peers and teachers in case of online classes, and do lack of face to face communication makes online classes less engaging.

Printed copies of the questionnaire covering all the questions were provided to all students, and a filled questionnaire was collected from all participating students. All the participant students were requested to fill the questionnaire individually. Response to all the questions from all participant students was entered in Microsoft Excel and analyzed. Active intervention was not attempted in the study, before COVID-19 pandemic traditional classroom teaching was the method of teaching which was changed to online teaching due to restrictions of the COVID-19 pandemic.

Ethical considerations
Consent was taken from all students who participated in the study. Ethical consideration was not required as no active change in teaching modality was there due to the study.

Results

Participants in this study were medical undergraduate students; the questionnaire was sent to a total of 101 students. A total of 75 students participated; female (26.6%) and male (73.3%) were in the age group of 18 and 30 years. We aimed to evaluate students about their perceptions regarding ease or difficulty of online lecture materials, assignments, and online navigation.

Questionnaires were made regarding the students' concern about understanding of course content, attention scale, convenience, doubts in class, technical issue, distraction during the class, and clarification of the doubts.

Survey reported that 25.3% of students found that online lecture material was satisfactory and easy to understand, while over 40% of students found the lecture material difficult to understand. 42.6% of students found that online assignments were difficult to clear the doubts, while 45.3% found difficulty in attention span during the online classes. Similarly, 64% reported difficulty in the discussion in online classes with the teachers and understanding the course, as shown in Table 1. The findings further indicate students' perceptions about the material are viewed as being rigorous even despite the ease of navigation. No comparative analysis was done between the rigor for face-to-face classes and online offerings. However, students perceived a difference between the amounts learned in the two modes even though course content was equivalent.

In academic environments, course organization and presentation are key factors that can either attract or distract students. Students need clarity and relevance in the materials presented to them. 24% of the participants agreed that the online courses were well presented and organized. On the other hand, 64.4% of the participants believe they have learned more in a face-to-face learning environment than in an online setting. Online learning is not always a seamless experience for students. Users encounter many problems including Internet interruption, system upgrade downtime, and instruction and organization to unreliable Internet connection.

Discussion

Within the last 20 years, the components of learning via computers have challenged the view that the traditional lecture is necessarily the most appropriate means of facilitating learning in a university environment. People found that e-learning has its own advantages on learning outcomes through researches on comparison research about differences between e-learning and traditional classroom.

Over the past decades, most institutions have expanded the list of courses being offered online, and a growing number of students favor online courses over traditional face-to-face courses. This is due in part to the flexibility that online courses provide, the convenience, and a host of other factors. Respondents in this study indicated that offering more online courses would not be that helpful. Some of the students perceived their online experience as being positive despite multiple problems in the online courses, including lack of understanding of the content of materials, limited access, and poor technological infrastructure. In addition, the majority of students found the lecture materials and assignments difficult to understand. These findings suggest that institutions need to address their students' desire for more flexible, technology-oriented educational platforms and to exert greater efforts to eliminate obstacles that might hinder the smooth utilization of these technologies.

In our study, the responders faced many difficulties. There should be orientation session for teachers and students on how to adapt to online classes and make learning fun and effective through classes before beginning online sessions for students. To ensure discipline is maintained in class, many educational institutions have issued e-classroom etiquette. It includes being properly dressed, being seated at a desk, and no interruptions from parents during the class. Classroom can be split into multiple batches so that it is easier to keep track of students in a session.

A study by Alsaaty *et al.*[3] compared and found out online experience as being positive despite multiple problems in the online courses. Thomas *et al.*[4] conducted a similar study where he compared students and found out Internet-based course showed higher performance of students on class-based course. Chen *et al.*[5] conducted another study where student perceptions in a MBA accounting concluded that the traditional classrooms would continue to offer benefits that cannot fully be obtained in any other manner. However, gaps in process effectiveness will continue to be narrowed as technology becomes friendlier for both instructor and students.

Table 1: Questionnaire-based response from students

Questions	Strongly agree, *n* (%)	Agree, *n* (%)	Neutral, *n* (%)	Disagree, *n* (%)	Strongly disagree, *n* (%)
Understanding	6 (8)	13 (17)	26 (34)	25 (33)	5 (6)
Attention	11 (14)	16 (21)	14 (18)	21 (28)	13 (17)
Convenience	34 (45)	32 (42)	3 (4)	4 (5)	2 (2)
Doubts	5 (6)	9 (12)	24 (32)	30 (40)	7 (9)
Technical issues*					
Attendance*					
Distracted	18 (24)	23 (30)	16 (21)	12 (16)	6 (8)
Regularity	21 (28)	28 (37)	14 (17)	6 (8)	7 (9)
Interaction	19 (25)	34 (45)	9 (12)	7 (9)	6 (8)
Engaging	13 (17)	35 (46)	9 (12)	11 (14)	7 (9)

*Subjective answer mentioned in results. Total number of participants *n*=75

Limitation and recommendation

Since this was a questionnaire-based study, possibility of the participants misinterpreting certain questions cannot be ignored. Response rate was about 75%. Although efforts were made to include open-ended questions, some questions were multiple-choice question based which could have limited the response of participants to few options. Future studies on this subject could use a face-to-face interview approach to get a better response rate and include more subjective and personalized responses of participants. In addition, there was only one time collection of data in this study. Further studies are needed to see if online classes can be an integral part of medical education, once the restrictions due to pandemic ease down.

Conclusion

One of the advantages the online mode offers is its flexibility in timing and delivery. They can even download the content, notes, and assignment. They can easily participate in discussion due to less anxiety and do group discussion and permanent record of feedback. Other advantages for students include not needing to commute. Despite all the advantages offered, there is a general consensus that no technology can replace traditional teaching in real because in this, there will be visual as well verbal discussion. Practical learning through in-hand training, demonstrations, and skill development, which of utmost importance in medical learning, is not possible through online teaching. Teachers might be less conversant and have apathy toward online teaching. It is difficult to keep track of student's attention. Doubt-clearing is hampered as well. Looking at the uncertainty of the current scenario, it is difficult to predict how long online classes will continue. Hence, it is of paramount importance that we assess the effectiveness of online classes and consequently take measures to ensure proper delivery of content to students, especially in a skilled field like medicine.

Conflicts of interest

There are no conflicts of interest.

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