E-learning in the Field of Medical Education: Journey from E-enhancement to Online and Moving towards Hybrid Mode

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Abstract

Background: The coronavirus pandemic has affected all domains of our lives. Medical education is one such field that has been severely affected by disruptions in practical skill learning for which rapid adaptations were to be made. Closure of educational institutes to control the spread of the novel corona virus resulted in a drastic shift to the online teaching mode. A sparingly used modality in the developing countries. To continue medical education, our institute transitioned through various modes of E-learning, beginning with the e-enhancement mode, and ultimately moving toward the hybrid mode. Although we were off to an erratic start, as time progressed, events began to proceed smoothly as the students and faculty adjusted to the new normal which continues to date. In this article, we share our experience as we transitioned through the various modes of E-learning.

Conclusion: E-learning has always played an important role in medical education. In the pre-COVID era, e-enhancement was already in use, but in a limited way, while during the peak of the pandemic, the online mode became indispensable. When the medical college re-opened and the physical presence of the students was now possible, the hybrid mode was predominant, i.e., there were in-person interactions between teachers and students, along with the continuation of other online components. This ensured that COVID norms were followed such as the maintenance of physical distancing, along with the continuous implementation of the curriculum of medical education.

Keywords: COVID-19, e-enhancement, E-learning, Hybrid mode, Medical education, Online teaching.

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Background

The advent of the coronavirus pandemic has forced us to make unforeseen adaptations in all realms of our lives. Medical education is one such field that has been affected for the worse with massive disruptions in the areas of practical skill learning and rapid adaptations needed to be made. In pre-COVID times, the education system relied heavily on classroom teaching and interactions, right from preschool level up to college level. The pandemic forced a shift from these traditional methods of classroom teaching to the online mode of teaching.

"E-learning" is defined[1] as "any learning that involves the use of internet or intranet." A more generalized definition mentions that it is "anything delivered, enabled, or mediated by electronic technology for the explicit purpose of learning".[2] The common denominator is the use of technology and electronic devices to enhance learning.[3,4] Web-based learning, online learning, distributed learning, computer-assisted instruction, or internet-based learning are also used synonymously and interchangeably for this type of learning.[5]

Medical education in our country has not relied much on the online modes of learning since this field relies heavily on bedside learning and skill development, which are indispensable. Lectures could have been conducted online but this practice was not widely adopted. In this article, we will discuss the advantages and disadvantages of E-learning in the medical field and will also share our experience with the online mode of classes which became the new normal ever since the pandemic began.

Review Results

We have discovered various advantages of online teaching in medical education. The foremost is that the student can learn at his or her own pace, in an environment in which they are comfortable.[6]

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There is no undue pressure of waking up early and rushing for a lecture. The second advantage is the wide reach of such lectures and the elimination of geographical barriers.[7,8] This method was time-saving as bigger batches could be accommodated in the same time duration.[9] There was an economical advantage with respect to construction and maintenance costs. This is particularly relevant for infrastructure which must be upgraded every time the numbers of students are increased per batch in a medical college. It is also easier to monitor the quality and to maintain uniformity of teaching by self-review, peer-review, and feedback since everything is recorded.[10] It also provides learning resources in a multimedia format for better understanding. Another added advantage is that it gives teachers, particularly new teachers, a chance to interact with students, try various methods of teaching and analyze student responses, thereby allowing them to improve and improvise on their teaching methods.

There are a few disadvantages, the foremost being the practicality of such teaching methods in the field of medical

education, in which skill acquisition is as important as acquiring knowledge. Even though these activities can be enhanced by the supplementation of lectures with videos (pre-recorded/live) and case-based discussions (paper cases), etc., via the online mode, bedside sessions, and laboratory-learning sessions for skill acquisition will remain indispensable. Online learning also requires an immense deal of motivation on the part of the students to keep up the subject being taught, and once interest is lost, they lose track which may be difficult to align with at a later stage. This does not usually happen in the classroom model of teaching as the teacher usually picks up the attitudes/feedback of the student based on facial expression and other cues and can adapt accordingly.[11] Internet connectivity is another major drawback in developing countries as E-learning requires the constant supply of high-speed internet which may not always be available. Moreover, the institute needs to have sufficient resources to upgrade the telecommunication facilities and provide constant training to the faculty about advances in the field of E-learning.

E-learning at our institute progressed through three stages since it was first implemented. Initially, power-point presentations and notes on lectures were uploaded onto the college website (www.ucms.ac.in). The students could download these and analyze them at their own pace, following which they were given assignments (via the same means) on the same topics which were to be submitted electronically (email their answers as PDF files to a common Email ID created for this purpose). This was followed by audio-supplemented presentations, which were shared with the students through email and WhatsApp. Case discussions and doubt-clearing sessions were then held via WhatsApp and Zoom (https://zoom.us/). Finally, we shifted to live online classes using an online platform (https://www.gotomeeting.com/en-in/webinar). This platform had the provision to conduct Mini Quizzes or "Polls" during the lecture where a question in the form of an MCQ was projected and the student could select whichever option he/she felt was right. Once the time limit expired, the results were displayed as a percentage so that the instructor could gauge the response of the students and solve any confusion related to the topic in the same session. This was accompanied by regular e-assignments via Google Forms (https://www.google.com/forms/) and discussion sessions via WhatsApp groups and Google Meet (https://meet.google.com/) which are still being carried out. MCQ-based quizzes were held every fortnight to keep the students engaged. Other than google forms, another online platform (https://quizizz.com/) which disguises the quiz as an online game was also used to help the students to relate and engage better with the learning activity. With the fall of a total number of cases of COVID and the gradual unlocking, the college was reopened in a phased manner. In this situation, the hybrid mode of E-learning was implemented with half of the student body reporting to the departments for practical classes, which were also conducted in smaller batches. At the same time, online classes were held for the other half not reporting physically to college. Although it put a considerable strain on the teaching staff in terms of the conduction of back-to-back classes on the same topic as the batches changed every 2 hours, it allowed better student–teacher interaction and more fruitful discussion of the topic. Another wave of cases forced us to shift back to the online mode. Currently, the Microsoft Teams® is being used to deliver online learning along with the use of social media messaging groups for direct communication and discussions.

Discussion

E-learning is of three types: e-enhancement, online, and hybrid or blended mode. The e-enhancement mode is the most commonly used among both professional and non-professional colleges.[12] In the e-enhancement mode, traditional classroom lectures are supplemented with audio or video aids. In the online mode, all interactions between the student and the teacher are *via* the internet and there is nil or very limited one-to-one contact at all. The hybrid/blended mode is a blended form of the above two, where certain aspects are covered online while the remaining are covered during sessions with one-to-one interaction.

The initial transition was difficult mainly due to the lack of awareness and training among the resource personnel. This was quickly resolved with the help of tutorial videos and practice sessions, all thanks to the commitment and leadership of the Medical Education Unit of our institute (website: http://medicaleducationucms.weebly.com/, Twitter: @MedicalUcms), who not only held training sessions but also made tutorial videos, PDF with pictorial instructions, time tables, etc. Apart from the few technical/connectivity issues, it has been smooth sailing ever since.[13]

While it was smooth sailing in most areas, the conduction of practical experiments was problematic. Under normal circumstances, a practical class used, to begin with, a briefing session, after which the students would perform the practical, and the results of which would then be analyzed and discussed with their respective batch teachers. In E-learning, the performance of the practice is out of the question as instruments and chemicals are not available to the students. To give them a hands-on experience, a teacher performed the practical, which was recorded, and this video was then shown to the students. Even though this is not an ideal method, this was the only practical recourse. Therefore, the student will still need to practice the actual experiment when the college reopens, but the briefing and discussion part of the practice can be a part of E-learning. We implemented the DEAPP (Demonstrate, Engage, Assess model for Practical teaching in Preclinical subjects) model in our institution and have reported its findings in another article.[14] From the informal feedback received from the students, it was noted that the students preferred a combination of audio supplemented presentations along with live lectures on certain topics, as it allowed them to learn at their own pace without any undue hurry.

Our institute not only caters to the students residing locally but also students coming from different states, some even hailing from remote areas where internet connectivity is an issue. Even though we were able to reach out to a majority of the students, some students could not avail of these learning opportunities provided by the college, in part or wholly due to problems with internet connectivity and speed. These constraints cannot be ignored, and appropriate steps should be taken so that the students are not deprived of learning at home. We need to tackle this issue head-on and develop facilities for the same. Standard operating procedures (SOP) need to be developed, adopted, and approved by the concerned authorities, for uniform and wide application. At the same time, quality check mechanisms also need to be developed to make sure that the quality of educations is not compromised. Based on our experience, there will probably be a shift from e-enhancement to hybrid/blended mode in the future, which will become a norm, when this pandemic is over.

Conclusion and Significance

To conclude, we would like to state that if implemented in an outcome-oriented and coordinated manner with the involvement of stakeholders, E-learning could be a boon in the field of medical education. This mode of education could largely replace the lectures and group discussions, which are held in traditional classrooms. However, as stated before, skill acquisition through this mode is not feasible, and therefore, offline clinics and practical sessions will continue to be an integral part of medical education, though they can always be supplemented with E-learning.

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