Original Article

Effectiveness of interactive dual-mode online platform for teaching and assessment of students during COVID 19 pandemic: Narrative experience and reflections of undergraduate medical students

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ABSTRACT

Objectives: The objective of the study was to evaluate the perception of the undergraduate students about the online platform developed, through a long-term, qualitative study. COVID-19 enforced initial lockdown and later closing of educational institutes, including medical colleges in India. The circumstances lead to adoption of online means of teaching for teaching the medical undergraduate students. An interactive dual-mode online platform was introduced for teaching and assessment of undergraduate students in our institute also.

Materials and Methods: Narrative experiences and reflections of students while attending online classes through the designed and delivered "interactive dual-mode online platform" were collected through open ended, anonymous Google forms.

Results: Students were satisfied with the online learning as a stop-gap arrangement. Although they were facing technical snags and internet issues, they were happy that their syllabus was being covered and they were receiving formative assessment, in whatever quantity and mode possible. However, they were concerned about the lack of clinical training.

Conclusion: To tide over crisis period, online teaching can be used, but one should shift to onsite teaching as soon as possible, particularly for medical students.

Keywords: Online teaching, Online assessment, Interactive lecture, Pandemic, Reflections

INTRODUCTION

As a preventive measure against the COVID-19 pandemic, the Government of India declared nationwide lockdown on March 24, 2020, restricting movement of the entire 1.3 billion population of India.[1] Initially imposed for 21 days, the lockdown was further extended and was then gradually lifted; but even by mid of October, school/colleges remained fully closed. It was worrisome for all to think that an extended lockdown period would lead to a substantial loss of learning time for students and probable depreciation in the confidence of the students.

Sensing a long "onsite educational lockdown" regulatory bodies issued guidelines for the conduct of online teaching of students.

The Medical Council of India (MCI), the regulator of medical education in India at that time also declared to follow all the notifications and guidelines issued by the Ministry of Health and Family Welfare, State or Union Territory government and concerned universities regarding closure of educational institution and suspension of classes of undergraduate students.[2] Subsequently, different advisories were issued from higher authorities to continue the online teaching for undergraduate medical students.

Although E-learning had been propagated by MCI, its use as pedagogical approach to teach the medical students was limited. Hence, it was a challenge for all the medical institutions in the country to maintain continuity of teaching and learning online, while dealing with the threat of pandemic also. Certain studies showing that interaction with telemedicine technologies during undergraduate medical training has contributed to improvement in core competencies, medical knowledge, overall learning, and higher quality patient care were encouraging in this crisis.[3] Hence, empowered by the previous experiences in literature many medical institutes and health universities initiated steps to start teaching and learning using various online platforms and the same was implemented in our institute also.

We self-designed an "interactive dual-mode online platform" (as explained further in methodology section) for synchronous online teaching, in-class interactivity, and asynchronous teaching as well as assessment. Further, the effectiveness of the platform was assessed by collecting perceptions and reflections of the students. It is imperative to mention that many studies on the use, utility and effectiveness of online platforms for undergraduate medical training during COVID pandemic have already been published; however, most of these studies were conducted during the very initial stages of lock-down and starting of online teaching and are restricted in their evaluation to quantitative metrics only.[4-7] We planned a long-term, qualitative study to document the experience of the medical undergraduates in attending online classes, which was altogether a new experience for all of them.

MATERIALS AND METHODS

Planning for delivery of online teaching

Although online teaching was not embedded in regular teaching learning program of our institute, still the involved stakeholders including the management, institutional administrators, and teachers made considerable efforts for availability and utilization of technology for continuing the process of education and to minimize the gaps that may occur as a consequence of the present crisis. As there are evidences that online teaching using video conferencing is similar to face-to-face education;[8] so, abiding by the advisories covering the safety issues for Zoom platform it was one of the mode chosen for synchronous online teaching.[9] Other chosen tools were Google classroom for asynchronous teaching and socrative app for in-class interactivity; thus making an "interactive dual-mode online platform." These applications were also used for online formative and summative assessment purposes.

Three online training sessions for faculty on the use of online platforms were held. Although it was easy to start online teaching with students of current generation, known by different names, such as digital natives and digital generation; still sensitization session for them was held.

Mode of online teaching and assessment

Only 3-h teaching schedule per day was implemented. Interactive lectures, practical demonstrations, case discussions, AETCOM sessions, student seminar, and tutorial were evenly distributed for preventing high screen time and for less data usage. Short videos on lab procedure and case based clinical examination were prepared and shared online on zoom platform and / or Google classroom by the faculty to replicate laboratory and clinical work.

To make the session interactive, students were asked questions during the sessions and were encouraged to switch on their microphones and clarify any doubts during the sessions. Socrative app was also used for the same. Interactivity was also built-in by using poll feature in Zoom during sessions. Some flipped classroom like sessions were also held where resource material of the class to be held was shared before the classes on WhatsApp group and / or Google classroom.

In-class formative assessment was conducted on Socrative app while after class planned formative assessment was conducted using Google forms on Google classrooms. Assignments, seminars, and tutorials (using break-out rooms) also served the purpose of formative assessment. Online internal assessment tests were conducted for theoretical aspects using same platforms.

Monitoring of online teaching

To monitor and facilitate the online teaching, a coordination committee was constituted. A monitoring cell was in place at the University level too. Faculty was given the option to either conduct the classes from home/office or from lecture theatres. A trained assistant was deputed at every lecture theater to assist and troubleshoot technical issues, if any.

Study protocol

This study was designed to collect narrative experiences and reflections of students while attending online classes through the designed and delivered "interactive dual-mode online platform." Narratives were collected through open ended, anonymous Google forms, containing six questions as mentioned in Bo×1.

Perceptions and reflections of the students were subjected to the thematic analysis and the themes about the use and

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Box 1: Open ended questions as contained in online questionnaire.

Q1. What is your experience of attending synchronous online classes? Write in your own words.

Q2. Have you received learning material on Google classroom? If yes, what is your experience of such learning material for students on Google classroom?

Q3. Were you assessed using Google classroom in-built facility like Google forms, quiz function for students' formative assessment? If yes, what is your experience?

Q4. Have you used socrative student app for in class interactivity? If yes, what is your experience?

Q5. Are you satisfied with the conduct and planning of E-learning program in your institute in emergency situation? If yes, please elaborate. If not, please suggest other ways and means for better performance in future.

Q6. What is your over-all experience of uses of self-designed "interactive dual-mode online platform" for teaching and formative assessment purposes?

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effectiveness of "interactive dual-mode online platform" for delivering online teaching and assessment were generated.

RESULTS

In all, 339 fully filled Google forms were received from students. Of these, 108 were from 1st phase, 102 from 2nd prof, 45 from final prof part 1, and 84 from final prof part 2. Students' narrative and experiences are shared below, for each question.

Experience of attending synchronous online classes

Major themes and categories which emerged are depicted in [Figure 1].

Majority of students were satisfied with the conduct of online theory classes, and they found it interactive as well.

Student 8: My experience had been great on zoom. Due to various plus points-like we can interact with the teacher on the spot and ask for our query. Meanwhile the ppts are also shared with us which makes the overall experience helpful.

However, they found it difficult to understand the practical and clinical aspects of the subjects online.

Student 44: Unable to do practical and dissection. Difficult to understand as audio problems. Unable to understand dissection in videos. And less interest due to lack of visual interaction.

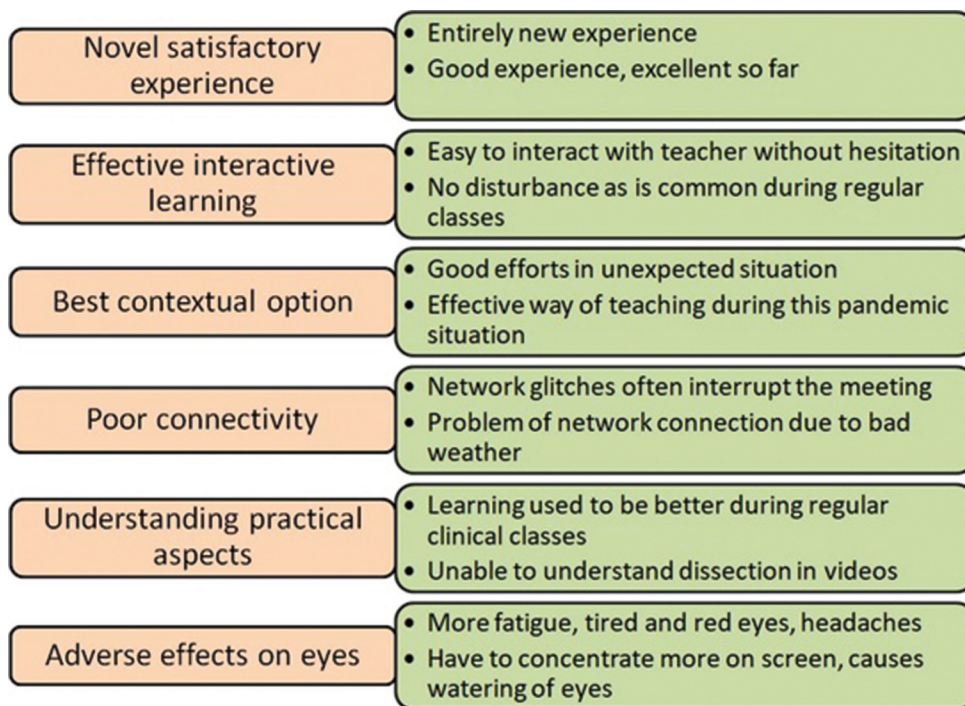Also poor connectivity and effect on eyes were a common problem.

Figure 1: Experience of attending synchronous online classes – Thematic analysis.

Student 236: *But sometimes we face the problems of our Network connection because of bad weather and even sometimes it's difficult to understand the practical part online.*

Student: 169: *But using regular online classes has added to our screen time. In this tech savvy era we are already have a lot of screen time in routine. With these classes it has added an additional burden. It has caused more fatigue, tired eyes, headaches, redness in eyes etc.*

Experience of learning material received on Google classroom

Major themes that emerged are depicted in [Figure 2].

Majority of students have good learning experience with the learning material being posted by the faculty.

Student 27: *Learning material was quite helpful and made the things easy to understand. Moreover, test uploaded on Google classroom helped us to learn in a better way.*

Student 189: *Learning assignments provided keep me refreshing and in touch with practical skills and boosts my knowledge with new enthusiasm.*

Student 316: *It becomes easy to understand some specific topics with additional videos and gives a sort of practical experience when attending clinical classes physically isn't possible. Helps clarify concepts.*

However, some students were not totally satisfied with the learning material being posted, due to one or the other reason.

Student 169: *It's difficult to submit assignment by typing throughout as we are not used to it.*

Student 235: *Initially, it was difficult to study from screen for too long but now I have adjust myself.*
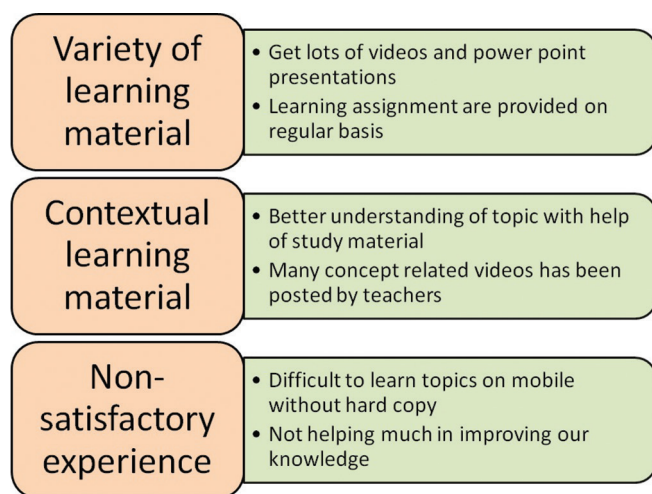

Figure 2: Experience of learning material received on Google classroom – Thematic analysis.

Student 281: *Doing assignments through Google classroom I find them a bit difficult in which we have to type the whole answer which is not convenient. But as far as MCQs are concerned they are easy to do.*

Experience of being assessed through Google classroom

We used Google forms and quiz function for assessment. Of the total 339 responses, nine students reported having no experience of being assessed through Google classroom. Remaining 330 reported using the facility for assessment. Of these, six reported their experience as – not good, three as poor, and six as stressful. Rest 315 reported it ranging as – Ok, fine, nice, good, interesting, quite good, very good, helpful, great, amazing, excellent, etc. The themes generated along with categories are depicted in [Table 1].

Although it was a new experience for almost all students – being assessed through online means, none-the-less students reported to have improved self-directed learning and getting more opportunities for immediate feedback.

Student 43: *I received back my Google form immediately. The feedback as well as assessment was immediate. I could immediately consult the book and check where I was wrong in attempting the question.*

Student 167: *It was my first experience with online assessment, but it is good method. It should be continued. I could immediately figure out my mistakes and shortcomings.*

Table 1: Themes and categories for students experience of being assessed through Google classroom.

Themes	Categories
Process of assessment	• Got immediate feedback • Got answers to wrong questions • Clearing of doubts with explanations for mistakes • Avoided cheating • Difficulty in using app
Learning experience	• Improved self-directed learning • In-depth learning • Helped in revision • Opportunity to improve on weak topics • Retention improved • Cheating happens
Helped in self-assessment	• Helped check learning • Helped check understanding • Helped compare with others • Could check progress
Established environment for learning	• Made students regular in studies • Substitute for challenging times • Saved wasting time

Experience with Socrative student app

Of the total 339 responses, 102 had no exposure to using the Socrative app. Remaining 237 reported using the app – either once or more. Out of these, only six reported their experience as poor. Rest of the students have at least satisfactory experience of using this app. The themes and categories generated are depicted in [Table 2].

Students liked the concept of having in-class interactivity using Socrative app. They wished that students should use it even during face-to-face classes.

Student 233: It is really nice app. It improves in-class interactivity. I hope teachers will continue to use it once we shift to regular mode of teaching-learning.

Satisfaction with the conduct and planning of E-learning program

Of the total 339 participants, 279 were satisfied, 42 were not satisfied while 18 were undecided. The major themes that emerged are depicted in [Figure 3].

Most of the students were satisfied with the E-learning program being conducted during these difficult times.

Student 142: Yes I am quite happy with this e-learning program. It's really a good initiative in such situations. And I think we can continue our lectures for some more time till the crisis goes away or till the parents are assure to send their children back to colleges.

Student 256: Yes I am satisfied with conduct and planning of e-learning program. Teachers are evidently putting a lot of

efforts in planning and executing the schedule. The syllabus of most subjects is being covered at apt speed and hopefully we won't be left behind.

Students were at the same time well-aware that it is not permanent solution and not a match to face-to-face classes.

Student 103: Look according to the ongoing situation it's good. But it does not keep us up as the real classes. Interaction is done but we still think being a final year student we should have had at least some subjective tests, because studying at home is really difficult.

Over-all experience of E-learning platforms used for teaching and formative assessment purposes

Over all experience was good to excellent for 288 students, fair for 18 students, and not good for 33 students. Major themes that emerged were – rapid coverage of syllabus, helpful in timely formative assessment, best option during pandemic, effective learning tool, brings motivation, etc.

Student 207: Well it's a good approach to complete our syllabus and to keep us in touch with our studies as most of the students have not bought books with them to home. So, yes it's a good way that we are still on touch with our studies.

Student 240: My personally experience with e-learning is average; I selectively give attention to only classes who are strict, only they engage us in active learning.

Table 2: Themes and categories for students experience with Socrative student app.

| Themes	Categories
Process of assessment using the app	• Got immediate feedback • Got immediate scoring • Clearing of doubts with explanations • Efficient time management • Good for MCQs • Network issues • Time management problem
Learning experience	• Detailed knowledge checked • Cleared many concepts • Help understand concepts better • Helps in revision • Thorough study • Cheating happens • No active learning • Too fast
Interactivity with teachers	• Interaction enhanced • Helped students to be more attentive • Students motivated to respond • Teachers could check understanding of students
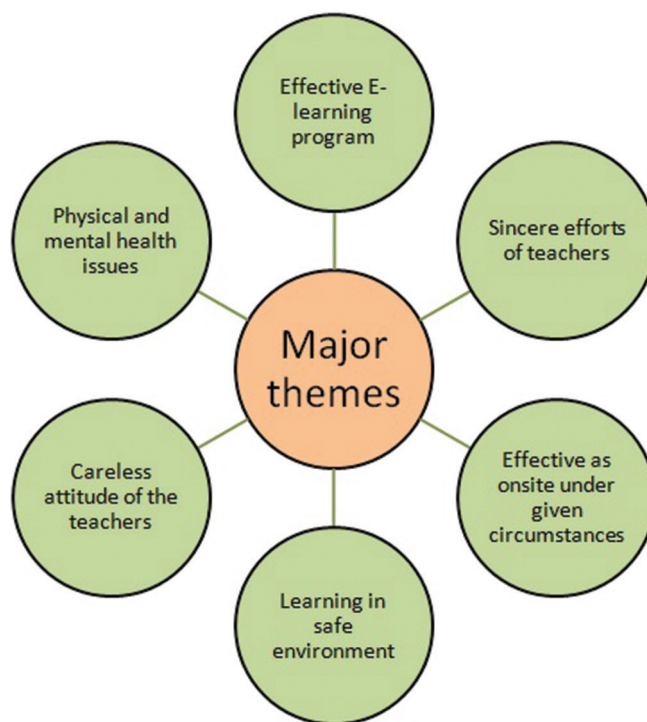
Figure 3: Major emerged themes for satisfaction with conduct and planning of E-learning program.

Student 311: *My overall experience is good. I appreciate all the efforts by our faculty that in this emergency situation they don't want our studies to suffer and we can make best use of it by self.*

Student 4*: It is fine. I prefer traditional teaching over e-learning platform. I am not confident to appear in exams for the syllabus covered in online classes.*

DISCUSSION

COVID pandemic situation is an unprecedented critical situation in the lifespan of current teachers and students. Teachers in medical colleges are having dual responsibility – taking care of the COVID patients as well as taking care of the students teaching and learning.

In India, probably for the 1st week of lockdown, students' teaching was hampered. Subsequently, medical teachers shifted to online means for teaching the medical undergraduate students. This teaching through online mode continued for almost 8–9 months. The period was considered as part of course duration by the regulatory body too. Thus, it was important for every institute to use whatever means they have at hands to compliment the teachers' technical expertise for the smooth conduct of online teaching, and at the same time, keeping them as close to face-to-face teaching, as possible. Precisely for the same reason, we designed an "interactive dual-mode online platform" for online teaching and assessment of our undergraduate medical students.

Most of the students were satisfied with the online platform considering the fact that no other option was available during the pandemic time and their syllabus was being covered even during lockdown. Similar kind of views were expressed by students in another study, analyzed using mixed method approach.[10]

Although students were satisfied with the interactivity in the theory classes to a large extent, they were probably missing the feel of interacting with the patients during clinical classes. The pain of lack of experiential learning was evident in their reflections.

Technical glitches, internet problems, and effect of continuous screen time on eyes were some of the concerns of the students, and students recruited in other studies share the same perception as our students.[10] Students were largely satisfied with the efforts being made by the teachers, for conducting their classes as well as for arranging their formative assessment through the developed online program.

CONCLUSION

Most of the students marked it as best available option for continued teaching during pandemic time. They were appreciative about the efforts made by the teachers during this emergency. However, technical glitches and internet issue were a problem for them. Most of the students opined that such E-learning program is not good for practical and clinical training.

Declaration of patient consent

Institutional Research Committee and Ethics Committee permission obtained for the study.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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