

# Distance learning - Bane or boon for medical students? A cross sectional survey among medical students

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## Abstract

**Introduction:** Teaching and learning is an evolutionary process, it never ends. The emerging of information and communication technology had made teaching and learning activity a very dynamic process. It has evolved from classroom dependent stage to an online environment. Conventional chalk and talk method is being replaced by E-learning. With emergence of COVID 19 pandemic, medical schools started using distance teaching-learning platform to train their students. This study was conducted to evaluate effectiveness of distance learning among medical students.

**Methodology:** A cross sectional survey was conducted among medical students using a structured and validated questionnaire with 5-point Likert scale, designed by subject experts incorporating statements related to advantages and challenges associated with distance learning and suggestions to address the same. Questionnaire was administered through google forms and responses collected. Internal consistency calculated using Cronbach's alpha is 0.98. Likert responses were analysed using consensus measure.

**Results:** The only advantage of distance learning as perceived by our students with good agreement of 80.9, 79.4, 76.4 was that, it offered learning at their own pace, immediate feedback following e-assessments and flexibility for learning respectively. Lot of academic challenges were faced by our students with good agreement of 76.9, 79 and 69.1 respectively towards lack of face to face interaction, motivation and real time feedback. Less competitiveness, poor critical thinking, difficulty in understanding practical sessions had an agreement of 79, 76.4 and 80.9 respectively. Lack of social interaction, connectivity issues, feeling of isolation, psychological, headache and visual disturbances were the non-academic challenges that had high agreement of 80.9, 79.4 and 76.4 respectively among our students for distance learning.

**Conclusion:** Effectives of distance learning varied among students depending on their perception. Most of the students missed collaborative learning environment of classroom and hands-on practical sessions whereas they enjoyed the flexibility during distance learning. Blended learning approach was suggested by students to compliment class room learning and distance learning

**Key words:** Distance learning, Classroom learning, E-learning

## Introduction

COVID 19 pandemic has affected all aspects of our lives including education. We are currently going through unrepresented academic crisis<sup>[1]</sup>. The sudden closure of medical college resulted in breach in knowledge transfer along with practical sessions, clinical posting and community exposures being abruptly terminated. Assessments both formative and summative took back seat<sup>[2]</sup>. This resulted in emergence of distance learning platforms

with implementation of social distancing during Coronavirus outbreak. Online classes became a key component in continuing medical education. Medical faculty quickly transitioned entire curriculum into online format. Not only content delivery, practical sessions and even examinations were also transitioned to online settings<sup>[3]</sup>.

To impart continued medical education, a Learning Management System for distance learning was

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developed in our institution. Faculty and students were trained towards using this platform so that learning continued for students. Shift from offline to online mode of teaching and learning was not a smooth transition both for faculty and students. After implementing for a period of one academic year for 2019 batch, we were interested in exploring our student's perspective on distance learning just like other medical educators; Mishra<sup>[4]</sup>, Syed<sup>[5]</sup>, Sebbani<sup>[6]</sup> across globe. Based on our survey results we were able to improvise our distance learning platform for the next batch of students. Our educational scholarship would definitely provide insight into advantages of distance learning, various academic and non-academic challenges encountered by students and these could be used by any medical educators while designing effective e-modules for their students in future.

### Objective

To evaluate effectiveness of distance learning among first year medical students

### Methodology

A distance learning platform called IMPARTUS was designed by software professionals customised to our Institution. A secured login credentials were generated for faculty and students and both were trained to use the platform. A new comprehensive time table was prepared incorporating theory and practical

sessions for all pre-clinical subjects. Faculty were instructed to prepare power-point presentations for their allotted topics and the content was delivered live. Practical sessions were also delivered live with faculty performing demonstrations. Recorded versions of both theory and practical classes were made available to the students for their future reference. This distance learning platform was implemented for 2019 batch students during the first wave of COVID 19 pandemic. Implementation period was from March 2019 to March 2020. Effectiveness of this intervention was assessed by means of a cross sectional survey among first year medical students using questionnaire after obtaining Institutional Ethical Committee clearance. Questionnaire consisted of four sections; section 1 dealt with advantages of distance learning, section 2 for academic challenges, section 3 for non-academic issues related to distance learning and section 4 suggestions to improve distance learning. A total of 17 questions were framed using 5-point Likert scale ranging from strongly agree to strongly disagree. Content & construct validity was done by subject experts and face validity by students. It was piloted on 5 students and these students were not included for the main survey. Informed consent was included as part of questionnaire. Internal consistency calculated using Cronbach's alpha was 0.98. Questionnaire was administered through Google form and responses collected. (table 1)

**Table 1: Survey questionnaire to evaluate effectiveness of distance learning**

| Items  | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|--|----------------|-------|---------|----------|-------------------|
| <b>Section 1: advantages of distance learning</b>                      |                |       |         |          |                   |
| Enjoyed learning at own pace   |                |       |         |          |                   |
| E assessments provided immediate feedback                              |                |       |         |          |                   |
| Flexibility in learning  |                |       |         |          |                   |
| <b>Section 2: Challenges in distance learning: Academic issues</b>     |                |       |         |          |                   |
| Missing face to face interaction                                       |                |       |         |          |                   |
| Lack of disciplined way of learning                                    |                |       |         |          |                   |
| Lack of motivation   |                |       |         |          |                   |
| Passive learning   |                |       |         |          |                   |
| Lack of faculty monitoring   |                |       |         |          |                   |
| Ineffective practical sessions   |                |       |         |          |                   |
| Critical thinking exercises of class room sessions were missing        |                |       |         |          |                   |
| Real time feedback was missing   |                |       |         |          |                   |
| Competitiveness missing  |                |       |         |          |                   |
| <b>Section 3: Challenges in distance learning: Non-academic issues</b> |                |       |         |          |                   |
| Missing social interaction with friends                                |                |       |         |          |                   |
| Connectivity issues  |                |       |         |          |                   |
| Psychological disturbance  |                |       |         |          |                   |

|   |  |  |  |  |  |
|---|--|--|--|--|--|
| Headache and visual disturbance                     |  |  |  |  |  |
| Feeling of isolation                                |  |  |  |  |  |
| <b>Section 4: Suggestions to improve</b>            |  |  |  |  |  |
| What changes/suggestion would you like to recommend |  |  |  |  |  |

Statistical analysis: Likert responses were analysed using consensus measure. Consensus measure is a useful tool in understanding dispersion of ordinal data. High consensus index indicates minimal dispersion of data and high agreement whereas low consensus index indicate maximum dispersion of data and low agreement.

## Results

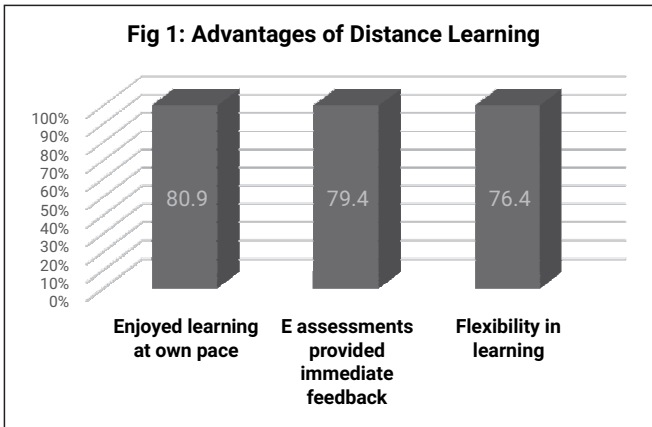
The survey was completed by 98 first year medical students. A mixed response was observed among our students with implementation of distance learning program during COVID lockdown period. This platform offered a couple of advantages with lot of academic and non-academic challenges among our students (table-2).

**Table 2: Students perception regarding effectiveness of distance learning**

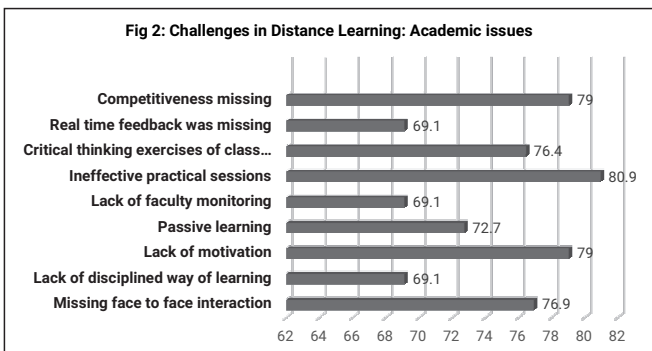
| Items  | Strongly agree  | Agree | Neutral | Disagree | Strongly disagree | Consensus index |
|--|---|-------|---------|----------|-------------------|-----------------|
| <b>Section 1: advantages of distance learning</b>                      |   |       |         |          |                   |                 |
| Enjoyed learning at own pace   | 65  | 30    | 2       | 0        | 1                 | 80.9            |
| E assessments provided immediate feedback                              | 60  | 34    | 4       | 0        | 0                 | 79.4            |
| Flexibility in learning  | 59  | 33    | 4       | 2        | 0                 | 76.4            |
| <b>Section 2: Challenges in distance learning: Academic issues</b>     |   |       |         |          |                   |                 |
| Missing face to face interaction                                       | 53  | 39    | 3       | 2        | 1                 | 76.9            |
| Lack of disciplined way of learning                                    | 26  | 40    | 24      | 8        | 0                 | 69.1            |
| Lack of motivation   | 29  | 55    | 11      | 2        | 1                 | 79              |
| Passive learning   | 44  | 36    | 15      | 1        | 2                 | 72.7            |
| Lack of faculty monitoring   | 26  | 40    | 24      | 8        | 0                 | 69.1            |
| Ineffective practical sessions   | 65  | 30    | 2       | 0        | 1                 | 80.9            |
| Critical thinking exercises of class room sessions were missing        | 59  | 33    | 4       | 2        | 0                 | 76.4            |
| Real time feedback was missing   | 26  | 40    | 24      | 8        | 0                 | 69.1            |
| Competitiveness missing  | 29  | 55    | 11      | 2        | 1                 | 79              |
| <b>Section 3: Challenges in distance learning: Non-academic issues</b> |   |       |         |          |                   |                 |
| Missing social interaction with friends                                | 65  | 30    | 2       | 0        | 1                 | 80.9            |
| Connectivity issues  | 26  | 40    | 24      | 8        | 0                 | 69.1            |
| Psychological disturbance  | 60  | 33    | 5       | 0        | 0                 | 79.4            |
| Headache and visual disturbance  | 53  | 29    | 3       | 2        | 1                 | 76.9            |
| Feeling of isolation   | 60  | 34    | 4       | 0        | 0                 | 79.4            |
| <b>Section 4: Suggestions to improve</b>                               | Hybrid learning/blended learning format to be used to make learning effective |       |         |          |                   |                 |

Our students perceived that distance learning offered flexibility in learning by allowing them to learn at their own pace with a high agreement of 76.4 and 80.9 respectively as analysed by consensus measure. We had shared recorded version of both theory and practical session which facilitated reinforcement of learning and also offered flexibility of learning at their own pace for students. E-assessments with immediate feedback also had good consensus of

79.4 among our students. Each session of theory and practical was followed by an E-assessment with combination of MCQ based, image based, case based questions followed by immediate availability of marks scored facilitated identification of areas of weakness and strength by students. These were the advantages of distance learning as opined by our students. (Figure 1)

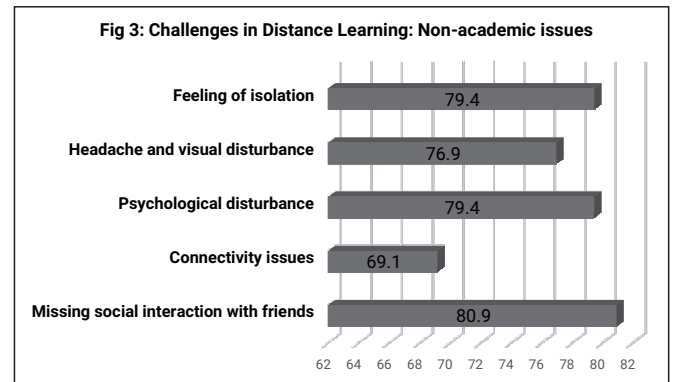


However, challenges faced by our students outweighed these advantages. Various academic challenges faced included lack of face-to-face interaction, lack of motivation, lack of real time feedback and lack of disciplined way of learning had high agreement of 76.0, 79, 76.4, 69.1 respectively. These were the perceived academic challenges by our students as they missed classroom teaching which had structured learning sessions with good interaction with faculty who would provide timely feedback for all learning activities and also motivate them to excel in their academics. Good consensus of 76.4, 80.9 and 79 was observed for poor critical thinking, difficulty in understanding practical sessions and lack of competitiveness in distance learning sessions. Students perceived distance learning to be highly passive with an agreement of 72.7 (Figure 2). Our students opined that distance learning sessions catered to the need of transfer of knowledge with continued medical education during COVID pandemic, but these sessions were perceived to be passive and they missed competitiveness and critical thinking skills facilitated by faculty when they engaged interactive lectures during offline teaching.

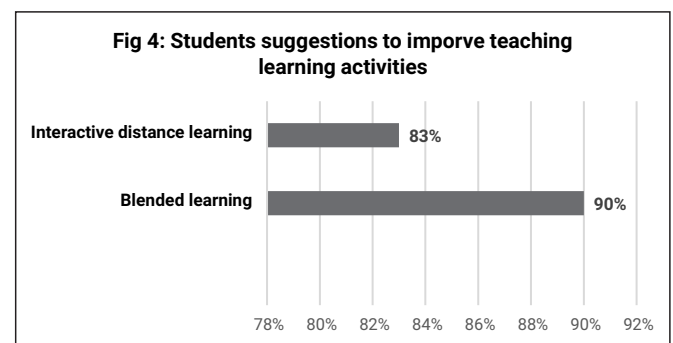


Students also faced non-academic challenges for which high agreement of 80.9, 79.4, 76.9 and 69.1 was observed for lack of social interaction, feeling of isolation, psychological disturbance, headache and visual, disturbance and connectivity issues respectively (Figure 3). With implementation of

distance learning, faculty were satisfied that they were able to translate their knowledge and skills through this learning platform. However, students perception differed, apart from academic challenges they had to deal with non-academic issues that hampered effective learning during COVID pandemic. Students' community believe in lots of social interaction and collaborative learning which they missed during distance learning resulting in feeling of isolation and psychological disturbances. With continued exposure to mobile/laptop screen students suffered form visual disturbance and headache. Further connectivity issues for students from remote areas hampered effective learning.



We faculty at our Institute were interested in deliberating effective teaching learning strategy during COVID pandemic. A component for suggestions were included in the survey form. Incorporation of interactive component during distance learning program was suggested by 90% of students and 83% suggested implementation of blended learning format in post COVID phase (Figure 4). As our students missed face-to-face interaction with their faculty, they suggested use of interactive component during distance learning to keep them motivated and to elicit competitiveness. Further they also suggested use of blended learning format post COVID phase with flipped class room strategy towards effective learning of basic sciences.



## Discussion

Before pandemic, teaching in most medical colleges has been mainly based on traditional concepts requiring physical presence of students in campus. The outbreak of SARS-Cov-2 with implementation of lockdown to curb the transmission of infection led to sudden shift of onsite teaching to online teaching and learning<sup>[7,8,9]</sup>. Learning management system was developed in our institution with training of faculty and students to use it. Faculty were engaged in online teaching to impart appropriate knowledge and skills to students during the lockdown period and we were curious to evaluate its effectiveness so that appropriate measures could be undertaken to make the learning experience an effective one.

On the positive side, the results of the study revealed that distance learning offered to students provided flexibility in learning where students were able to learn at their own pace as recorded lectures were made available to them along with live sessions. E-assessment provided immediate feedback so that the students were able to identify their area of weakness and strength (table 2). The advantageous aspect of our study were in accordance with that of Stoehtret al<sup>[10]</sup> who investigated various aspects of online learning among 3286 medical students across 12 different countries. Responses to their survey revealed that online learning offered greater flexibility of 84% and most of their students were satisfied with quantity (67%) and quality (62%) of online learning. Further our observations were similar to that of Yonum Sandhaus<sup>[11]</sup> and team, who reported that, their students expressed high satisfaction with electronic learning regarding its quality, technical assistance, online interactions and availability of recording for future reference. The only contrary observation of our study was that online interactions were perceived to be less effective by our students.

On the negative side, our results emphasised that distance learning imposed academic and non-academic challenges to students. Academic challenges faced included lack of face-to-face interaction, lack of motivation, lack of critical thinking, lack of real time feedback by faculty with less competitiveness and no disciplined way of learning. These observations are in alignment with that of Ibrahim et al<sup>[12]</sup> who concluded in their study that there is need for appropriate training of both students and faculty along with well-designed e-modules incorporating interactions and measures to enhance motivation among students towards acceptance of e-learning. Feeling of isolation due to lack of real-time social interaction among peers, headache, visual,

psychological disturbances and connectivity issues were the non-academic challenges faced by our students during distance learning. In a larger survey called DigiMed study, Stoehr et al<sup>[10]</sup> observed missing motivation factor, risk of social isolation and lack of interaction among medical students as drawbacks of e-learning and our observations were very much similar to these. Our observations were congruent with that of AlQhtani et al<sup>[13]</sup> and Sumanta<sup>[14]</sup> who emphasized that online learning was less effective as it lacked face to face interaction when compared to traditional class room setting. Challenges observed in our study were congruent with an integrative review on barriers and solution to e-learning by Doherty et al<sup>[15]</sup> who concluded that a comprehensive overview of online platform has to be acquired by both students and medical educators along with maintenance of meaningful communication to overcome barriers of missing motivation and interaction.

With sudden shift from offline to online teaching and learning with untimely lockdowns, there was a need to develop curriculum framework of online learning. Taking learners interest into consideration, challenges faced by them during distance learning need to be converted into opportunities. This can be done by use of a hybrid model for learning with online component for deliberation of theoretical content and offline component for practical and clinical skills. The initiation for the same will be attempted in our institution with agreement of all stake holders.

## Conclusion

Based on the results of the survey, the outcomes of the study propose that distance learning is a feasible approach to continue medical education in COVID era. We conclude that distance learning offered both flexibility and challenges to learning and there is a need to convert these challenges to opportunities by switching on to blended learning format with interactive offline component and E-assessments in post COVID era.

## Limitations

Faculty perception was not evaluated. Only first professional year students were surveyed and not others.

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