

## ORIGINAL ARTICLE

## Perceptions of Undergraduate Medical Students towards Online Learning in a Medical College in the National Capital Region (NCR), India

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### Abstract

**Background:** Since the COVID-19 pandemic hit the globe, it has not been possible to conduct traditional classroom teaching in view of the closure of schools and colleges in our country since March 2020. Hence, it is important to study the highlights, demerits, and bottlenecks in the implementation of online education from a student's perspective. **Methods:** The present study was carried out to assess perceptions regarding virtual classroom among undergraduate students of a tertiary medical college in U.P. A pre-designed, semi-structured questionnaire was used. Study was conducted through an online survey. Data was analyzed with the help of SPSS version 21. **Results:** A total of 377 participants were included in the study. More than half of the participants (54.9%) preferred a mixed mode of learning which includes both online and offline learning. Lack of interaction with teachers (66.3%) and fellow students (57.6%) and lack of quiet space at home to listen to online classes (44%) were a few of the perceived demerits of online classes. Internet speed was found to be one of the most challenging issues faced in online learning (78.5%). **Conclusion:** Students' perception of the blended learning mode was positive. They were, however, less enthusiastic about online learning than they were about conventional classroom learning.

### Keywords

COVID-19; Pandemics; Perception; Students; Schools; Internet

### Introduction

The COVID-19 Pandemic had a negative impact on the entire country's education sector. All the educational institutions in India were temporarily closed by the last week of March 2020.(1) Approximately 1.4 billion students were affected by countrywide closures of schools and universities, according to a UNESCO report. Our whole education system underwent a drastic change, and we have now entered an era of virtualization of the education system.(2)

Virtual learning is a relatively new concept that has grown in popularity over the last few decades. Previous studies indicates that students find online classrooms to be a

positive learning experience.(3) However, anxiety, boredom, and a sense of isolation were also found to be associated with online learning.(4) Learners' performance was found to be better in an online session than in a face-to-face method since they could access the course as per their convenience.(5) Achievements of the students were also found to be better with blended mode of learning as compared to traditional classroom method.(6) Educators believe that all aspects of online education should be improved in order to be better prepared for future incidents similar to COVID-19.(7)

While educators must develop and acquire new and effective online pedagogy for teaching and assessment methods for virtual sessions, students also have to adapt

to this new mode of learning. Therefore, it becomes imperative to know the opinion of medical students about Online learning.

### Aims & Objectives

1. To assess perceptions of medical undergraduates regarding online teaching, and learning sessions.
2. To determine positive aspects, negative aspects, and challenges from the student's perspective.

### Material & Methods

A cross-sectional study was conducted among 1st, 2nd and 3rd professional year undergraduate medical students in a medical college in Uttar Pradesh. The study was conducted over a period of 6 months from February to July 2021.

Following a thorough literature review a semi structured questionnaire consisting of following sections was created:

**Section 1:** Participant characteristics

**Section 2:** Perceptions of the students about online classes in a five-point Likert Scale format (1- Strongly Agree, 2-Agree, 3-Neutral, 4-Disagree, 5-Strongly Disagree).

**Section 3:** Multiple response questions on the benefits, drawbacks, challenges, and health concerns associated with online classes

**Section 4:** Open-ended question to determine the learner's suggestion on how to improve the quality of the online classroom session

The questionnaire's pretesting was done by discussion of draft questionnaire by subject matter experts and further modified and revised as per suggestions and recommendations. A pilot study was also conducted among 30 participants, and the information was used to make relevant changes in the questionnaire.

Ethical clearance was obtained from the Institutional Ethics Committee (Ref. No. SU/SMS&R/76-A2020/35). The questionnaire was administered through an online Google form. A link to the google form was created with a consent form attached to it which was sent to students through WhatsApp and E-mail. Participants were required to give their consent after clicking the link before proceeding to the questionnaire section. All the students who attended online classes and gave their valid consent were included in the study. A total of 377 students gave consent to participate in the study. The collected data was entered into the SPSS version 21 and analysed using descriptive statistics.

### Results

A total of 377 students participated in the study. Approximately 214 (56.8 %) were females, and 163 (43.2%) were males. The majority of participants (38.2%) were from the third year of MBBS, followed by the second (33.7%) and first professional year (28.1%).

[Table 1](#) shows preference of usage of gadgets and applications by the students. Almost all the participants, 374 (99.2 %) had heard about zoom followed by 277 students (73.5 %) who said that they had heard about google meet and only 60(15.9 %) had heard about You tube as a learning platform. Mobile phone was the most frequently used device (94.4 %) to attend virtual classroom teaching, followed by laptop (48.8 %) and a mere 1.3% used desktop.

[Figure 1](#) depicts the preferred mode of learning of the students. More than half of students (54.9%) believe that a mixed method of learning that includes both online and face-to-face instruction is the best way to learn. Purely offline was recommended by one-third of the students (37.9 %) and only 7. 2 % thought that purely online learning to be the best method.

On a Likert Scale of 1 to 5, students' impressions of virtual classroom teaching are depicted as Strongly agree, Agree, Neutral, Disagree, and Strongly Disagree in [Figure 2](#). When asked whether they feel that a video demonstration teaches skills the same as a regular clinical posting, 20.9% agreed, while nearly two-thirds of students (60.5%) disagreed. More than one third of students (9.5% and 22.8% strongly agree and agree, respectively) felt more comfortable participating in an online class discussion than in face-to-face classroom discussions. More than one-third of students (13% strongly agree and 27.1% agree) believed that the mode of assessment through online mode is as good as the mode of assessment through regular method. When students were asked whether virtual classroom teaching enhances the performance level of students, more than one fourth (39.2%) disagreed and 21.5% agreed. More than one-third of students (40.1%) were satisfied with online classes, while 31.8% were not satisfied.

As depicted in [Figure 3](#) more than three-fourth study participants (37.7% and 39.5% strongly agree and agree respectively) felt that COVID-19 pandemic has had a negative impact on medical education. On asking views of students if they think that virtual education can cater to students' needs of higher education in geographically tough areas, more than half of the students agreed to this (16.7% and 39.8% strongly agreed and agreed respectively). More than one third (13.8 % and 28.6% who strongly agreed and agreed, respectively) agreed when asked if online classes along with traditional classrooms should be made a part of the regular undergraduate medical curriculum.

[Table 2](#) depicts the merits, demerits, and challenges of virtual classroom teaching. When asked about the benefits of online classes, 256 (67.9%) students said they saved traveling time, 223 (59.2%) thought it was more convenient to take class from the comfort of their own home; 194 (51.5%) had more time to study; and 146 (38.7%) said introvert students feel freer to ask questions during online classes. When enquired about the negative

aspects of online classes, the majority of the students (66.3%) stated that there is a lack of face-to-face interaction with faculty. More than half (57.6%) experienced that lack of interaction with other students leads to a feeling of disconnection from them and 44.0% had a problem with access to a quiet study space at home. More than three-fourths of students 299 (79.3%) experienced visual fatigue due to increased screen time, followed by 263 (69.8%) who experienced headaches. Neck pain, backaches, and pain in finger joints were other reported health problems. The majority of 296 (78.5%) of students perceived Internet speed as the most difficult challenge in adopting virtual classroom teaching. Other challenging issues associated with online classes were: lack of accessibility to the internet (57.3%), power failure (37.9%), lack of understanding about technical aspects (33.2%), and lack of gadgets (24.4%). Nearly one-third of students stated that they were in favor of attending online classes in the future.

## Discussion

The present study assessed the perceptions of 1st, 2nd, and 3rd year medical students regarding synchronous forms of online learning. Online education has served as a boon in this pandemic. This study is an attempt to investigate the student's perspective to determine the sustainability and effectiveness of online education. At a higher education level, students' perceptions and attitudes become increasingly relevant. Long-term viability of online education is contingent on both learners and educators adapting to this mode of instruction.

There are a number of applications available for imparting online education, like the Zoom application, Google Meet, Webex, Go To Meeting, etc. In the present study, the Zoom application was both the most frequently heard and most frequently used platform for online classes. Koirala D et al. in a cross-sectional study among nursing students reported that nearly two-thirds of students were satisfied with the Zoom platform.(8)On the contrary, Gupta et al. in a cross-sectional study conducted among medical students in Northern India reported that only 21.5% of students preferred learning via the Zoom App.(9)In the present study, the Zoom app was the most popular and familiar mode, as the university conducted online classes primarily through the Zoom app and sometimes via Google Meet.

Smart phones were the most popular device to access online sessions, followed by laptops. Multiple other studies also reported that smart phones are the most frequently used gadget to attend online classes.(9,10,11,12)This may be due to the easy affordability of smart phones in comparison to laptops and tablets. Also, phones can be used more easily from any location, even while travelling, as compared to other devices.

One of the major findings of our study was that more than half of the students felt that blended mode was a more effective method for learning. However, only 7.2% preferred a purely online mode of learning. A similar conclusion was reached by Akuratiya & Meddage in a study conducted among students of a higher education institute in Sri Lanka. The study revealed that more than half of the students preferred the blended mode of education, and the majority of the students were positive about online learning.(13)First year medical students in a Chennai based study felt that online classes were of great benefit during pandemics and similar situations.(14)In a study carried out in Nepal, Rana S et al. reported that the majority of the participants agreed that traditional teaching was better, but the general perception toward online classes was mainly positive.(15)

However, our finding contradicts the outcome of a few studies reporting a negative perception towards online classes, with the majority of students preferring face-to-face learning rather than the online learning mode.(10,16,17,18,19)A decreased interest in online learning can be attributed to an unfamiliarity with this modality for both teachers and students. Digital learning is an evolving field, and there are still many challenges and technical issues present. It was also noted that students feel more accepting of a blended mode of learning. Some students opined that for theoretical sessions, classes can be conducted via online mode while clinical scenarios and practical sessions can be taught via conventional mode.

Less than one-fourth students in our study believed that virtual teaching improved student performance. Students suggested that a reduction in the size of the batch to 25-30 students could improve student interaction and enhance the performance. Also, newer technologies and ideas can be further explored to get a better understanding of digital learning. Spitzer & Musslick, in a study done among German students assessing their performance before and after lockdown, found that there was an overall increase in the performance of the students and also an improvement was observed in the performance of low-achieving students.(20)

According to our study, a comparable proportion of students felt more at ease in an online class discussion (32.3%) as they did in face-to-face discussions (32.9%). Ramchandran and Kumar reported that study participants felt comfortable with interaction in an online classroom for shy and slow learners.(14) A study conducted among university students in Bangalore reported that the majority of the participants felt that the quality of online classroom discussion was quite low.(19)A classroom has both introvert and extrovert type of students. As there is a sense of disconnection in an online class, introvert students may feel less anxiety and stress by being a part of the classroom discussion. However, extrovert students thrive in traditional classroom discussions and perform better in face-to-face discussions with their teachers and

peers. Therefore, considering their different learning styles, both types of students should be equally encouraged in an online class.

More than half of the participants in the current study agreed that virtual education may meet the demands of students seeking higher education in remote areas. Rana et al., in a cross-sectional study among nursing students, reported that nearly two-thirds of students believed that online learning is useful for distance education.(15) The National Statistical Office Report, Sarvekshana, (2020) observed that only 24 % of households in India had access to the internet (21) However, over the years, the internet accessibility rate in India has steadily increased, with a market research report registering an overall internet growth of 41%.(22) Internet usage in rural India has soared as compared to the pre-COVID era. In the remote regions of a developing country like ours, online education can prove to be a viable source of learning.

Hours saved on travelling, more time to study, and the convenience of accessing classes from home were some of the major benefits that the students perceived. Gupta et al. found the convenience and increased participation of shy students as the most important merits.(9) Comparable findings were observed by Ramachandran and Kumar.(14) A national cross-sectional survey among medical students in the UK revealed that students perceived time saved in travelling and efficient utilization of saved time to study for clinical placements as significant merits.(17)

Visual fatigue, headaches, and neck pain were some of the health problems encountered owing to the online classes. The results were supported by other studies as well.(11,16,23) Chakraborty et al. reported an increased stress level among students and a disturbance in sleep due to increased screen time.(24)

The demerits of online classes observed in our study were in accordance with the findings reported by other studies.(9,11,19,23) Key challenges faced in adopting virtual classroom teaching were consistent with previous studies which reported technical issues and internet connectivity as critical concerns impeding the adoption of digital learning.(11,16,19,23,25) These challenges and demerits impede the acceptance by the learners, and consequently, they cannot be overlooked for the successful implementation of online classes. Some students believed that blended teaching should be made a part of the routine undergraduate medical curriculum. As the blended mode of teaching and learning becomes more acceptable, as seen in the present study, integrating it with the routine undergraduate medical curriculum will make online classes more sustainable.

### Conclusion & Recommendation

The present study revealed that though the students did not prefer online classes over traditional classrooms, they were enthusiastic about the blended mode of education.

They also believed that learning clinical skills through video demonstrations was an inadequate substitute for bedside clinical posting. The study highlighted a number of demerits and technical obstacles associated with online learning. The medical curriculum demands high-quality educational methods. National Medical Council has also advocated a blended mode of teaching after the onset of the COVID-19. To meet the educational challenges in the present scenario, when online learning is no longer optional, there is a need to train the teachers to improve the overall quality of online classes. Students felt that a lack of understanding of applications and gadgets used for online learning was a challenge, and a few did not have the necessary gadgets to access online sessions. Students facing such issues should be provided additional training and support. A majority of the students felt that online classes should be a part of the regular curriculum. The perceived merits of online classes should be further enhanced. More video demonstrations, animated videos, emphasis on clinical aspects, frequent assignments, and more interactive sessions were some of the useful suggestions put forth by the students. These suggestions should be incorporated to make the online learning more acceptable. An additional session should be conducted for the students to teach them how to handle this new mode of learning, how to handle online assignments and how to adapt to online classes and use them to their advantage.

### Limitation of the study

The findings cannot be generalized as the study was conducted only among medical students at a private medical college.

### Relevance of the study

The study indicated that students were more receptive towards a blended mode of education as compared to purely online classes. The study also highlighted that students had a positive perception towards learning theory via online mode, but they preferred traditional classes for practical sessions. Also, students sometimes lack the basic understanding of using gadgets for online classes, so students can be trained regarding using gadgets for online classes.

### Authors Contribution

All the authors have contributed at various stages of composition of the final manuscript.

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**Tables**

**TABLE 1: GADGETS AND APPLICATIONS FOR ONLINE LEARNING (N=377)**

		N	%
Online platform heard for learning_*	ZOOM classes	374	99.2
	Google Meet	277	73.5
	Google Classroom	102	27.1
	Microsoft teams	239	63.4
	You tube	60	15.9
Online platform preferred *	ZOOM classes	373	98.9
	Google Meet	236	62.6
	Google Classroom	16	4.2
	Microsoft teams	186	49.3
	You tube	26	6.9
Device used *	Laptop	184	48.8
	Tablet	73	19.4
	Mobile phone	356	94.4
	Desk top	5	1.3

*(Multiple response table) \**

**TABLE 2: MERITS, DEMERITS, CHALLENGES AND HEALTH ISSUES OF ONLINE LEARNING (N=377)**

		N	%
Positive aspects of online classes *	Hours saved in travelling	256	67.9
	More time to study	194	51.5
	Interesting	58	15.4
	Introvert students are more likely to ask questions	146	38.7
	You understand subject better in an online class	22	5.8

	Response time from teachers is quicker in online class	78	20.7
	Better concentration at home than classroom	85	22.5
	Convenience to take class from comfort of home	223	59.2
Negative aspect of online class *	Lack of face-to-face interaction with faculty	250	66.3
	Lack of access to a quiet study space at home	166	44.0
	lack of interaction with other students leading to feeling of disconnection from them	217	57.6
	Delayed feedback from instructor	65	17.2
	Sense of isolation	144	38.2
	Monotonous classroom sessions	213	56.5
Health problems faced due to excess of virtual classroom teaching *	Visual Fatigue	299	79.3
	Fingers' Joint Pain	64	16.9
	Backache	168	44.6
	Headache	263	69.8
	Neck Pain	179	47.5
	No Problem	8	2.1
Key challenges faced in adopting virtual classroom teaching. *	Acceptability	72	19.1
	Accessibility to internet	216	57.3
	Lack of understanding	125	33.2
	Power Failure	143	37.9
	Internet speed	296	78.5
	Lack of gadgets	92	24.4
	None	4	1.1
In future would you like to take more online classes	Yes	115	30.5
	No	131	34.7
	May be	131	34.7

(Multiple response\*)

Figures

FIGURE 1 PREFERRED MODE OF LEARNING (N=377)

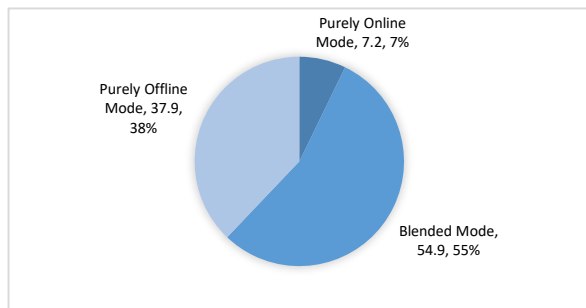


FIGURE 2 PERCEPTION OF STUDENTS TOWARDS ONLINE LEARNING (N=377)

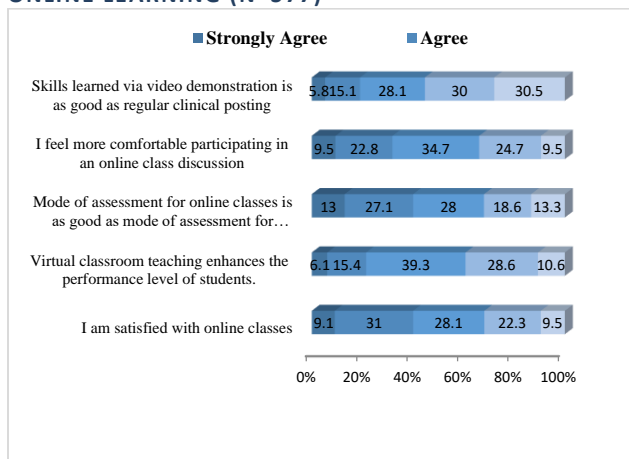


FIGURE 3: IMPACT OF ONLINE CLASSES ON MEDICAL EDUCATION (N=377)

