

## Preferences and perceptions of MBBS students towards blended learning in medical education

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### Abstract

**Introduction:** With the advent of COVID-19 pandemic there has been a rapid shift in the mode of delivering education. A swift transition from place-based offline classes to virtual online learning platforms has emerged during the pandemic. The present study explored the acceptance, perceptions and preferences of blended learning among medical undergraduate students.

**Methods:** MBBS undergraduate students of second and final professional (Part I & II) phases from Jawaharlal Nehru Medical College, AMU, Aligarh, UP were enrolled in the study. We studied acceptance, perception and preferences regarding blended mode of learning of MBBS students using online Google Form. Semi structured questionnaire was drafted by the research team, based on thorough and critical review of pertinent literature and other similar survey tools. Each item was discussed separately and changes were made where required. Then, it was transformed to an online form through Google Forms.

**Results:** Out of a total of 432 students, more than 3/4<sup>th</sup> of students (78.2%) believed that combined approach would lead to improvement in learning. Around half (53.6%) of the female students were relying predominantly on offline learning compared to 37.0% of male students ( $p = 0.004$ ). Flexible schedule and personal convenience was reported as the most common benefit of online learning while lack of interaction with peers and connectivity issues were found to be the major disadvantages.

**Conclusion:** Majority of the students echoed a positive attitude towards blended mode of teaching and learning. Medical education is largely demonstration and application based for acquiring skills. Therefore, a combined approach where the theoretical aspect of the curriculum is made online, might offer a more convenient, flexible and effective alternative way of teaching and learning.

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### Introduction

As we recover from the COVID-19 pandemic and its after-effects and plan to restructure the way we approach our day-to-day lives, there has been a rapid shift in the way we do and approach certain things. One such thing that has undergone

profound change is the mode of delivering education. The traditional mode of offline education could not be carried out after enforcement of the lockdown. Thus, an increasing trend in E-Learning activities was observed during the pandemic, making a swift transition from place-

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based offline classes to virtual online learning platforms [1]. This led to innovation as well as familiarity with various platforms of online education. As the pandemic has eased-off, we have slowly returned to the traditional classroom teaching. However, it is intuitive to utilize the advantage of familiarity of online platforms that we have gained during this period and one wonders whether a combined online and offline approach will enhance learning and improve its outcome. In fact, today we are already witnessing the age of blended or hybrid education [2].

Blended learning is defined as any combination of face-to-face teaching with technology-mediated teaching, where all participants in the learning process are separated some of the time by distance [3]. Studies have reported that blended system may increase education levels and stimulate learning for health professionals [4,5].

Even though hybrid mode of learning is not a new concept, it has taken the centre stage in post COVID-19 pandemic period. Blended learning is promising for medical education curriculum because of its advantages over traditional learning at least in certain domains. Like other disciplines, better outcomes in medical education have been obtained through blended approach compared to traditional offline approach [6]. In this study we have explored the acceptance, perceptions and preferences of blended learning among medical undergraduate students. This would help in developing an acceptable and effective blended learning curriculum in medical undergraduate education.

## Methods

MBBS undergraduate students of second and final professional (Part I & II) from Jawaharlal Nehru Medical College, AMU, Aligarh, UP, were enrolled as respondents for this study. These were the students who had experienced online teaching during the lockdown and have now returned for on-campus classes.

Semi structured questionnaire was drafted by the research team, based on thorough and critical review of pertinent literature and other similar survey tools. Each item was discussed separately

and changes were made where required. Then, it was transformed to an online form through Google Forms.

The initial questionnaire was administered to 40 students on a pilot basis and the questionnaire was accordingly modified and refined based on the feedback from those respondents regarding feasibility and minimizing the ambiguity. Batch wise WhatsApp group of students was created and the final Google Form questionnaire link was shared. The purpose of the study was explained to students and confidentiality was assured, following which they were asked for their voluntary participation. The link was disabled after 10 days of circulating the Google form. Data were collected regarding demographic variables, acceptance, preferences, perception, pros and cons, limitations and suggestions for online teaching.

Offline learning was defined as classroom based traditional mode of learning by the students where students and teacher both physically remain present. It also included students' self-study where they use books and other printed/hand written materials for study.

Online learning was defined as use of virtual mode where the teacher and student need not be physically present; teaching was delivered by employing any of virtual networks such as Zoom, Google Classroom, etc. This also included students' self-study where they use online coaching platforms for their study.

The data from Google forms was imported as MS excel (2010) sheet and then transferred to IBM SPSS Version 20.0 for analysis. Frequency and percentage were calculated for most of the responses to summarize the data and presented in the form of tables and graphs. Chi square test was used to find the association of categorical outcomes.

**Ethical clearance:** The study was approved by the Institutional Ethics Committee, Jawaharlal Nehru Medical College and Hospital (JNMCH), Aligarh Muslim University (AMU), Aligarh-IECJNMC/1065.

## Results

A total of 450 students were shared the questionnaire out of which 432 responses were received.

**Table-1:** Association between gender and preferred mode of learning

Gender	Mode of learning			Total
	Offline n (%)	Online n (%)	Combined n (%)	n (%)
Male	108(37%)	8 (2.7%)	176 (60.3%)	292
Female	75 (53.6%)	2 (1.4%)	63 (45%)	140
Total	183 (42.4)	10 (2.3)	239 (55.3)	432

Note:  $\chi^2 = 10.838$ ,  $p = 0.004$

**Demographic details of participants:** Out of total 432 students, 292 (66.4%) were males and 140 (33.6%) were females. The mean age of respondents was  $21.36 \pm 1.52$  years. Around 3/4<sup>th</sup> (n=327, 75.7%) of the participants were hostellers and the remaining (n=105, 24.3%) were day scholars.

**Mode of learning:** All the students had previous exposure to online learning platform. More than half of the students (n= 239, 55.3%) were already using combined mode in their routine learning activities, 42.4% (n=183) were practicing predominantly traditional offline learning and only 10 students (2.3%) were predominantly using online approach. Around half (n= 232, 53.6%) of the female students were relying predominantly on offline learning compared to 37.0% (n=160) of male students ( $p = 0.004$ ) [Table-1].

Close to 3/4<sup>th</sup> of the respondents (n= 338, 78.2%) believed that blended mode of teaching would lead to improvement in medical education (Table-2).

**Table-2:** Distribution of the respondents regarding the perception of combined mode of teaching in medical education

Do you think combined (online + offline) teaching approach will lead to improvement in learning in medical education?	Number (%)
Yes	338 (78.2%)
No	53 (12.3%)
Not Sure	41 (9.5%)

**Students' preference for combined learning:** The devices used by the students for attending online classes were smart phone (n=228, 51.5%), tablet

(n=156, 36.1%), laptop (n= 40, 9.1%) and desktop (n= 14, 3.3%). An overwhelming majority (n= 394, 91.2%) of students said that they would prefer WhatsApp for communication regarding class updates (Table-3). Wi-Fi is the preferred source of internet for 60.2%(n= 262) of students and remaining 39.8%(n=172) predominantly use mobile data for attending online classes.

**Table-3:** Preferred platform for receiving class updates

What is your preferred platform for receiving class updates?	Number (%)
WhatsApp/Telegram/Signal	394 (91.2%)
Email	18 (4.2%)
SMS	8 (1.9%)
Others (College website/YouTube)	12 (2.7%)

**Framework of blended learning:** Live classes that can be recorded was the most preferred (n =248, 57.4%) format for online class. Around 1/5<sup>th</sup> of the students preferred recorded classes and live online classes (n= 88, 20.4% each) and only 1.8% (n=8) of the students preferred reading material only (Table-4). With regards to content of class, 88.7% (n= 383) of the students preferred video with supplementary reading material, 9.0%(n=39) preferred video content only and 12.3% (n= 53) preferred reading material only.

With regards to delivery of content in an online class, majority (n=268, 62.0%) of the students favoured both Power Point alongside white board teaching, 19.2% (n=83) students preferred white board teaching only, 17.6% (n=76) preferred only Power Point teaching while only 1.2% (n=5) students desired lecture only (Table-5).

**Table-4:** Students' response regarding their preferred format for online class

What would you want to be the format of an online class?	Number (%)
Live classes that can be recorded	248 (57.8%)
Live online classes	88 (20.4%)
Recorded classes	88 (20.4%)
Reading material only	8 (1.8%)

**Table-5:** Responses with regards to mode of delivery of contents in an online class

What should be the content of the online class according to you?	Number (%)
Power point alongside white board	268 (62.0%)
White board only	83 (19.2%)
Power point only	76 (17.6%)
Only lecture	5 (1.2%)

**Addressing the queries:** Preferred methods for clarification of doubts by the students were: separate offline session (n=166, 38.4%), WhatsApp (n=125, 28.9%), separate online live session (n=124, 28.7%), and email (n=13, 3.0%) [Table-6]. A little over one-third of respondents (n=157, 36.3%) said that queries should preferably be clarified before the next class, 25.7% (n=111) said that it should be addressed within a day, 22% (n=95) thought that within 2-3 days is fine, and 16% (n=70) wanted this done within few hours.

**Table-6:** Preferred modality for clarification of queries

	Number (%)
Separate offline session	166 (38.4%)
WhatsApp	125 (28.9%)
Separate live online session	124 (28.7%)
Email	13 (3%)
Others	4 (0.9%)

**Methods to improve learning:** Out of 432 respondents, 356(82.4%) believed that including a quiz session of 5-10 minutes during each class would improve learning while the majority (n= 184, 42.6%) disagreed that assignment at the conclusion

of each class would lead to better learning. Most of the respondents (n=287, 66.4%) believed that assignment at the completion of each unit would lead to reinforcement in learning.

**Benefits and challenges:** Flexible scheduling and personal convenience was the most common listed item by 86% (n= 372) of the respondents when asked about benefits of combined learning. More comfortable environment and greater ability to concentrate were other advantages listed by 55.1% (n=238) and 27.8% (n=120) of respondents respectively while 22.7% (n=98) thought that it would lead to improvement in technical skills and 20.4% (n=88) believed that it might also lead to improved self-discipline (Table-7).

**Table-7:** Benefits of combined learning as perceived by students

Benefits of combined learning	Number (%) of respondents
Flexible schedule and personal convenience	372 (86.1%)
More comfortable environment	238 (55.1)
Greater ability to concentrate	120 (27.8)
Improve technical skills	98 (22.7)
Improve self-discipline and responsibility	88 (20.4)

With regards to challenges, connectivity issues (due to inadequate/interruption of internet services) and daily data limitation were identified by 74.3% (n=21) and 57.9% (n=250) of students respectively while 53.5% (n=251) admitted that little or no face-to-face interaction is also a significant limitation. Intense requirement of self-discipline (sticking to a fixed time schedule to attend classes in the absence of attendance pressure) and poor learning environment (formal classroom environment that offline mode provides is not available at home and in hostels) were reported by 41.0% (n=177) and 26.4% (n=114) respectively.

When asked about the limitation of online theory class, responses varied from lack of interaction with friends and colleagues (n=130, 30.1%), connectivity issues (n=107, 24.8%), to intense requirement of self-discipline (n=60, 14.0%). Other responses included little/no face-to-face interaction (n=50,

11.6%), daily data limit (n=48, 11.1%) and poor learning environment (n=35, 8.2%) [Table-8]. There was no significant difference between hostel students and day scholars in this regard (p= 0.22). The responses of males and females were also similar (p= 0.41).

**Table-8:** *Challenges of combined learning as perceived by students*

Challenges of combined learning	Number (%) of respondents
Connectivity issues	321 (74.3)
Daily data limit	250 (57.9)
Little/no face-to-face interactions	231 (53.5)
Intense requirement of self-discipline	177 (41)
Poor learning environment	114 (26.4)

## Discussion

Over the last few decades, an increasing number of educational courses in the health sciences, as well as courses across schools, colleges and universities, have introduced online curriculums. Improvements in performance of students have also been reported with blended approach of teaching and learning [7]. With the introduction of lockdown during the COVID-19 pandemic, online education became a necessity thus exposing every student to an online learning experience. In this study, we investigated students' experiences, opinions and acceptance of online education combined with on-campus offline education.

Although online platform is not an official part of the current medical education curriculum, 57.6% of the students in our study were already employing online platforms at personal learning. This point towards the emergence of alternative online learning platforms and the fact that majority of the students are finding it attractive, accessible and beneficial. Smart phones and Tablets were commonest devices used by students for their online learning. These devices are handy, can be carried along easily and can be accessed anywhere. Wi-Fi was the preferred source of internet connection for majority (62.5%) of students and these were the students who reported lesser connectivity issues compared to others who used mobile data. Any official shift to online

platform would also need to ensure availability of Wi-Fi facility for students to ensure smoother implementation.

With respect to framework, our study revealed that live classes that could be recorded as the most preferred (57.4%) format for online class followed by recorded classes and live online classes (20.4% each) and only 1.8% of the students preferred reading material only. Similar finding were reported by Muthuprasad et al [8] where classes uploaded at the university website/YouTube or any other accessible platform was the most preferred format (54.4%), followed by recordable live classes (27.04%) and live classes alone (17.9%). Only 0.65% wanted reading materials. Recorded lectures allow students to review electronic learning materials at their own pace as often as necessary and this likely enhances their learning outcome. Rawat et al[9] in their study reported that 43.7% of their study participants felt that the online method of teaching was convenient and most of the students in the study agreed that it provide better learning and improve retention of the topics. Al-Balas et al [10] found that 63.8% of their students reported flexibility of time as one of the major advantages of online learning. With regards to content of the class, majority of the students preferred video with supplementary reading material [11,12].

To summarize the students' responses with regards to framework of the online class, it was found that apt content, smooth connectivity, recorded learning materials along with proper timely follow up makes online classes as good as the traditional classroom situation. Most of the responses from the students in our study reiterated these points. Thus, online mode of delivering education allows institutions and teachers to reach their learners virtually, enhances convenience and opens educational opportunities and these points have been reiterated across many studies in the past [11,13,14].

When asked about methods to improve learning, more than three quarter of students (79.7%) believed that including a quiz of 5-10 minutes during each class would improve learning. Quizzes as effective means to improve online learning is amply supported by data from previous studies [15,16].

Flexible scheduling and personal convenience were the common listed items by 85.1% of respondents when asked about benefits of hybrid learning. Similar findings were reported by others [8]. Studies indicated that unlike the traditional classroom learning, it was convenient for the students to do an online course in collaborative groups without the need for rearranging the schedule for everyone [17]. Also in online setup, resources are often accessed easily from home computers by the students [18]. Therefore, care needs be taken to schedule the online classes as per the learner's conveniences and it will only help if recorded videos are uploaded at an accessible platform so that the videos may be accessed as per the convenience. However, it has also been reported that students who are not committed to strict discipline often procrastinate which leads to poor performance [19].

With regards to challenges, connectivity issues and little/no face-to-face interactions were identified by 74.7% and 53.9% of students respectively. Gautam in her article also reported similar concerns [20]. While connectivity issues can be addressed over the due course of time in our country, advantages lost due to lack of face-to-face interaction among colleagues will remain a concern. This is another case for blended approach where students will be benefitted from the advantages that both modes offer while also overcoming the disadvantages.

Undergraduate medical education may turn to a hybrid/blended mode where the theory classes are conducted online while demonstration based and clinical classes are conducted offline. The findings from our study can be very helpful in designing the content, structure as well as in choosing the appropriate modes for the online classes.

We limited our study only to undergraduate students and excluded the teachers and instructors which could have offered more insights.

The findings of our study indicated that majority of the students echoed a positive attitude towards online classes. The online platform was found to be advantageous as it provides flexibility and convenience to the learners. Students preferred structured content with recorded videos uploaded timely at accessible platforms. They also indicated

the need for interactive sessions with quizzes and assignments at the end of each unit to optimize and enhance their learning process and learning outcome. Thus, all these factors and preferences should be considered while developing an online curriculum to make it more acceptable, effective and productive for the students. Thus, familiarity with online platforms gained during COVID-19 pandemic may be utilized to design a more robust medical education curriculum involving both online and offline modes thus benefitting the students with advantages that each mode offers.

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