Original Article

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Quick Response Code:

Website: www.jehp.net

DOI: 10.4103/jehp.jehp_11_22

An overview and analogy of pedagogical approaches in online–offline teaching tactics in COVD-19 pandemic

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Received: 03-01-2022
Accepted: 05-05-2022
Published: 31-10-2022

Abstract:

BACKGROUND: Learning helps acquire knowledge or skills. COVID-19 outbreak severely affected the progress of education all across the globe. Pandemic-induced alternative methods of teaching promoted the progress of online education. Hence, this study is undertaken to assess an overview of teaching learning strategies in the COVID-19 pandemic so as to explore the direction of medical education and help perk up the teaching learning methods in medical education.

MATERIAL AND METHODS: The cross-sectional study involves first year medical undergraduate students of 2020–2021 batch studying at Dr.VMGMC, Solapur. It involves complete enumeration of students of 2020-2021 batch. Due to the second wave of COVID-19 pandemic hematology, classes were continued and completed by the same faculty by online live teaching using Microsoft teams. As this being an online survey, it was ethically exempted. A comparison of questionnaires between offline and online classes was done by using χ^2 test and a *P* value less than 0.05 was considered as significant. Quantitative data generated by the dichotomous question and five-point Likert scale questions were analyzed using descriptive statistics and frequency analysis. Out of 189 respondents, majority of students preferred traditional offline classes over online classes. Self-directed learning was feasible in both methods of teaching.

DISCUSSION: Traditional offline classes were more interactive and enthusiastic than online classes. Offline classes helped students to revise, recollect, and reproduce necessary information as their attention span was better in offline teaching than online teaching.

CONCLUSION: Holistic understanding and better learning were experienced through traditional offline classes. Although teachers take double efforts for online teaching, the overall learning effect and impact of traditional offline classes were much better than online classes. It definitely motivates andrgaogy and helps understand the concept on their own.

Keywords:

COVID-19, overview, paedagogy, teaching tactics

Background

Education is a "process of bringing about a desired change in the behavior of the learner." Education provides the pathway to reach their destiny. The purpose of education is to learn. Learning is process of relatively permanent change in the behavior of the learner.[1] Learning helps acquire knowledge or skills through study and experience. In December 2019, in Wuhan City, Hubei Province in China, number of people suffered from severe respiratory illness which was later identified to be caused by novel coronavirus called coronavirus disease 2019 or COVID-19.[2] Gradually, COVID-19 cases soared across most of countries resulting in a global pandemic. The COVID-19 outbreak has

How to cite this article: Daulatabad V, Kamble P, John N, John J. An overview and analogy of pedagogical approaches in online–offline teaching tactics in COVD-19 pandemic. J Edu Health Promot 2022;11:341.

forced educational institutions and universities to shut down and suspend classes that severely affected the progress of education all across the globe. This pandemic led to think of alternative methods of teaching, which promoted the progress of online education. It not only increased the importance and urgency of online education but also provided an opportunity for in-depth teaching learning methods. COVID-19 pandemic has been around for more than a year. Meanwhile, in later months of 2020, there was brief period of unlock down which encouraged physical classroom teaching in an offline mode. However, in India, the number of cases began to rise from March 2021 resulting in much more severe second wave of Pandemic. Hence, online teaching has been more of necessity now which is managing to cater students to acquire knowledge and skills. This shall give us new insights for better and improvised teaching and also provide a reference to carry out teaching reforms in medical education. Our present study is undertaken to assess an overview of teaching learning strategies in the COVID-19 pandemic so as to explore the direction of medical education and help perk up the teaching–learning methods in medical education.

Materials and Methods

Study design: Cross-sectional survey

Study setting: First-year medical undergraduate students of 2020–2021 batch studying at Dr. V.M.G.M.C, Solapur.

Study participants: First-year medical undergraduate students of 2020–2021 batch Sampling method: A complete enumeration of students of 2020–2021 batch.

Data collection tool and technique: As per competency-based medical education [CBME] syllabus, hematology classes/lectures were conducted by traditional face-to-face physical classroom teaching using PowerPoint blended with necessary audiovisual aids at the beginning of the semester. However, later due to the second wave of COVID-19 pandemic, hematology classes were continued and completed by the same faculty by online live teaching using Microsoft teams.

On completion of classes, a prevalidated detailed questionnaire which was our data collection tool was prepared and circulated through Google form and its link (https://docs.google.com/forms/d/e/1FAIpQLScklyZoBA2cG91GHcIw6UfUvlPkU4lHfK3fbv9wms7PdN1BHg/viewform?usp = sf_link) was forwarded to students' Whatsapp group forquick mode of communications.

Ethical consideration

As this being an online survey, it was ethically exempted. Among the batch of 200 students who read an informed consent, 189 students voluntarily participated in the survey. The survey was administered in three parts: the first part asked participants basic demographic characteristics including age, gender, place of residence; in the second part dichotomous questions were asked to determine whether they attended offline classes before the second wave of pandemic, whether they were attended online classes, device, and the type of internet used for online classes. Variety of close-ended questions were asked in the same session so as to understand which type of teaching method has greater impact on students' learning behavior; the third part of the survey had five-point Likert scale questions on teaching learning effectiveness of both offline and online teaching modes. Student's feedback data of 189 respondents was obtained and statistically analyzed using SPSS software. Comparison of questionnaires between offline and online classes was done by using χ^2 test, and a P value less than 0.05 was considered as significant. Quantitative data generated by the dichotomous and five-point Likert scale questions were analyzed using descriptive statistics and frequency analysis.

Results

Table 1 depicts the demographic details of the participant students ranged from 18 to 24 years of age. Among 189 respondents, most of them were 19 years (44%). Female participation was 46%, whereas 54% were males.

Table 2 reflects among the batch of 200, maximum students, that is, 92.1% attended traditional offline classes and 92.6% students attended online classes as well.

Graph 1 reveals that more than two-third students (71.4%) felt traditional classes were more interactive and enthusiastic, which helped 63% students to revise, recollect, and reproduce necessary information. Holistic understanding of the topic and the better learning was experienced through traditional classes

Table 1: Basic characteristics

Characteristics	Number	Percentage
Age		
18	44	23.3
19	82	43.4
20	46	24.3
21	13	6.9
22-24	04	2.1
Gender		
Female	87	46
Male	102	54

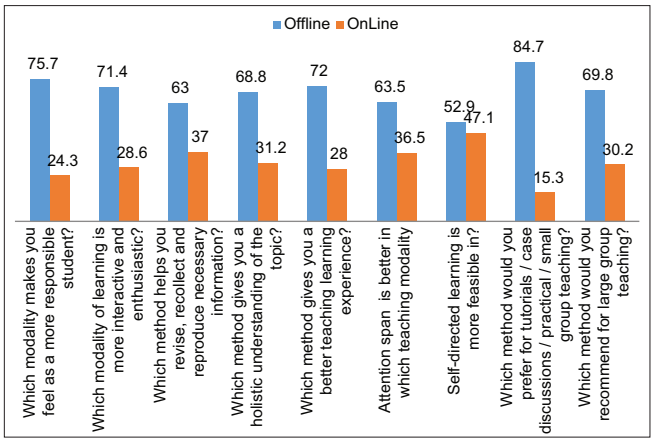
Table 2: Dichotomous questions

Questions	Yes	No
Were you attending lectures offline lectures?	92.1%(174)	7.9%(15)
Did you attend lectures online lectures?	92.6%(175)	7.4%(14)

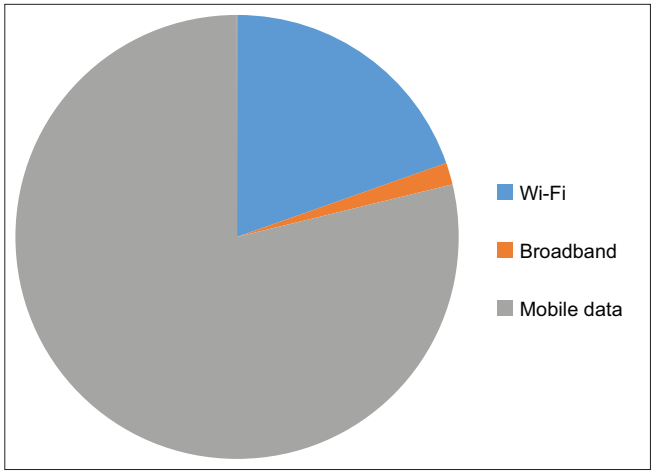
by 68.8 and 72% students, respectively. Majority of students (84.7%) preferred traditional offline classes for tutorials/case discussions/practicals and small group teaching and 69.8% students also recommended it for large group teaching, while traditional offline classes were more effective and had greater impact than online classes [Graph 1]. On statistical analysis of the above questionnaire, *P* value was <0.0001 (highly significant). However self-directed learning was feasible in both methods of teaching, its *P* value was 0.26.

Graphs 2 and 3 represent that traditional classroom teaching can be extended to virtual online classes through better network platform, high-speed internet, and use of electronic gadgets. E-learning is trending and considered as new normal education. The study results revealthat more than two-third students (78.8%) preferred using mobile data internet connectivity for online classes [Graph 2]. The most preferred gadget for online classes was a smartphone for 87.8% students followed by laptop and desktop [Graph 3]. On statistical analysis of responses, *P* value was <0.0001 (highly significant).

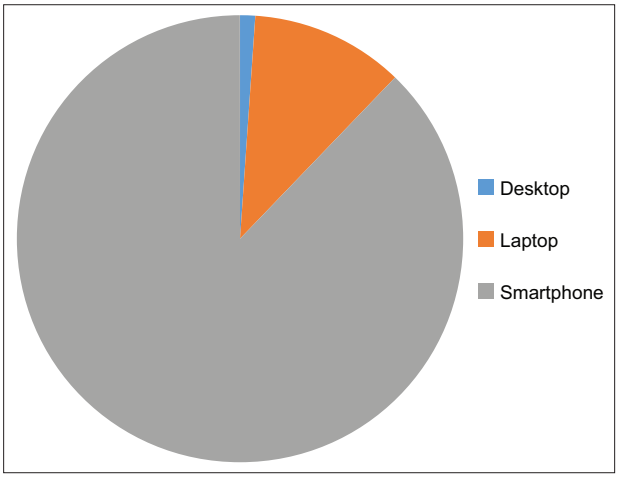
Graph 4 reveals that Likert scale (1) reveals 39.7% strongly agreed and 27% agreed that teaching learning is affected by the presence of the facilitator. Point 2 reveals that most of the students strongly agreed (34.9%) or agreed (23.3%) that taking down notes during offline classes was easier than in online classes. Point 3 reveals that among 189 respondents, 38.6, 28, and 19% strongly disagreed, disagreed, or remain neutral when asked if the offline learning environment is uncomfortable due to fellow classmates, whereas total of 14.3%(9.5%, 4.8%) felt so. Point 4 states that offline classes were noisier, chaotic than online mode for 31.3% students totally. Point 5 reveals that 30.7% respondents strongly agreed along with 21.2% respondents who agreed that asking questions or doubts is easier in online mode than in offline mode. Point 6 reveals that results reflect 28 and 34.4% students strongly agreed and agreed that online mode provides a fear-free atmosphere for learning and for giving immediate feedback to teachers. Point 7 reveals that only 11.6% strongly agreed and 16.9% agreed that online classes provide more personal attention than offline classes.



Graph 1: Close-ended questions



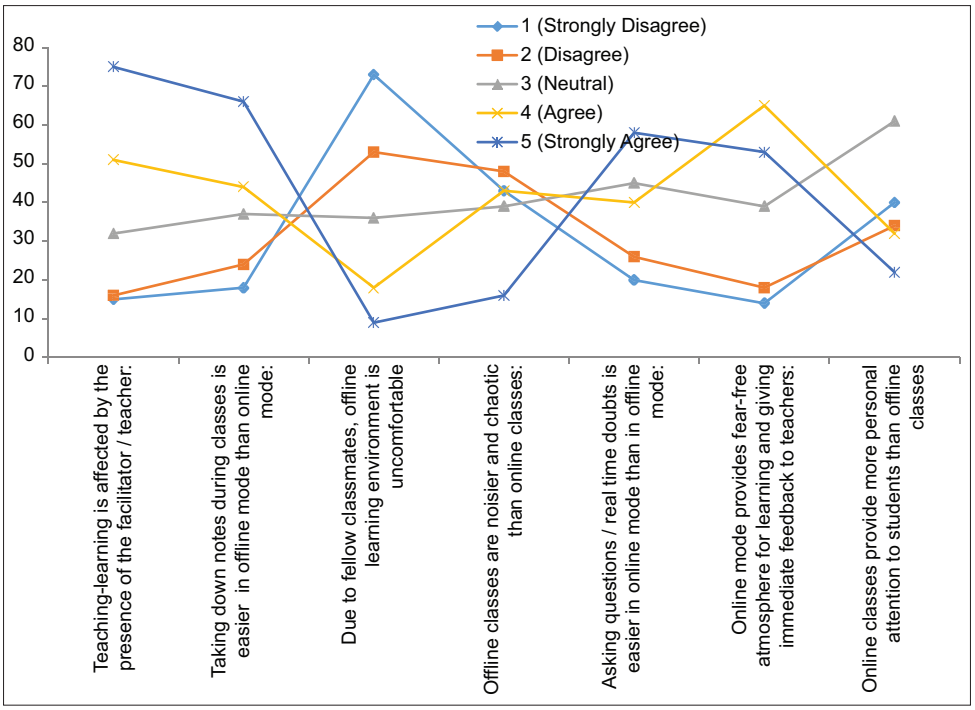
Graph 2: Use of internet by the means of following



Graph 3: Attending classes online by means of following

Discussion

Medical education is transitioning away from pure traditional classroom instruction and toward a hybrid of traditional offline and online live classes. CBME, which was recently established, focuses on active learning and helps students comprehend Bloom's taxonomy as it progresses in complexity. Traditional offline classroom teaching methods such as large group teaching, small group teaching, practical sessions, early clinical exposure, case-based learning, problem-based learning, and flipped classroom not only focuses on the deeper levels of Bloom's taxonomy's cognitive domain but also helps cover psychomotor domain and affective domain and promotes self-directed learning as a part of pedagogy.[3]



Graph 4: Effectiveness of teaching–learning methodologies

In our study, 92.1% attended traditional offline classes and 92.6% students attended online classes as well.

Traditional offline classes are more effective and have a higher impact than online programs, according to our research. More than two-thirds of those polled believed that conventional offline classes were more involved and enthusiastic than online programs, which also aid with communication skills. Students believed that online courses were not as good as offline courses in terms of classroom interaction, and that the overall learning effect of traditional offline classes was much better in a study conducted by Yun Hong *et al*.,[4] in which students believed that online courses were not as good as offline courses in terms of classroom interaction and that the overall learning effect of traditional offline classes was much better. Our research also found that conventional offline classes helped students revise, recollect, and reproduce important material since their attention span was higher in offline sessions than in online ones. Traditional offline classes provided a holistic grasp of the material and improved learning. For tutorials, case discussions, practicals, small group instruction, and big group teaching, students preferred and recommended traditional offline sessions. Hikmat *et al*.[5] found that online learning is more successful for theoretical classes and less effective for practicals. However, our research shows that self-directed learning is equally possible in all teaching styles. Students can use online classes to incorporate self-directed learning, which is crucial in competency-based medical education for adult learners. Tang B *et al*.[6] also considered that incorporating online instruction into medical education improves learning outcomes for medical undergraduates. The findings of our study are also in line with those of Zhang *et al*.[7] and F. L. Rachmah *et al*.[8] Pei *et al*.,[9] on the other hand, found that online learning improves medical undergraduates' knowledge and abilities and is a far more viable strategy than offline learning. Through a stronger network platform and high-speed internet, traditional classroom instructions can be expanded to virtual online classes. Online learning requires the use of a computer, laptop, or smartphone, as well as access to the internet. In the present COVID-19 pandemic, e-learning is considered a new normal education. According to the findings, nearly two-thirds of medical undergraduates (78.8%) choose to use mobile data internet for online classes, while only a few students use Wi-Fi internet and broadband connections. Our survey participants chose a smartphone for online lessons, followed by a laptop and a desktop. Jun Zhoa's research shows that online learning classes are successful but inefficient because the expenses of purchasing internet to keep up with online lectures is higher when compared to traditional classrooms.[10] However, research shows that Whatsapp is less expensive and easier to use than other apps; therefore, it is a popular choice for online classrooms. R. Radha *et al*.[11] Observed in another study that E-learning is an effective teaching strategy for bringing out the best in students.[12] Sukmadinata *et al*.[13] discovered that E-Learning offers several advantages, including low cost, accessibility from anywhere and at any time, and universality. Kamble and Gosavi study's illustrates how combining online and offline interactive

classes increases student performance, learning gains, and topic retention. Flipped classroom education improves students' understanding of topics, piques their attention, and stimulates their intellectual activity.[14-16] The efficiency of offline and online courses in terms of teaching and learning was assessed using a quantitative five-point Likert scale. According to the majority of study participants, the presence of the facilitator has a substantial impact on teaching–learning. It was a lot easier to take notes during offline classes. On the other hand, online mode provided students with a risk-free environment in which to study, ask questions, and give feedback to their lecturers. Both teaching methods provided the same level of personal attention during lectures. Although a small percentage of students stated that conventional offline classes are noisier and more chaotic than online classes, the majority of respondents did not believe that traditional offline classes are uncomfortable because of their classmates.

Limitation and recommendation

Limitations: as this was a survey involving only one batch of students, this can be utilized on a larger scale like involving more than two to three batches of students, not only from one college but other medical colleges and institutions.

Recommendations: first, as this study has been able to gather information regarding use of effectiveness of online–offline modes of teaching, may be use of this dual modality of teaching would bring about the change so needed in students regarding able to be bold enough to present themselves in front of the class. This, thus, helps them overcome the fear of presenting themselves to the audience. Second, while using a new CBME curriculum for students, which incorporates SDL, ECE as parts of their curriculum, may be use of this online modality of teaching can also be incorporated as a smaller section to begin with in the newer curriculum as a whole or a part of the syllabus to begin with for any subject. Third, use of this online modality of teaching–learning methodology can help us get in touch with other renowned speakers, peers, academicians, or universities from where our students can benefit from them. Lastly, in an Indian perspective when we consider students living in remote areas wherein there is a lack of infrastructure for either schools or colleges, this online modality of teaching will be a boon for these students who would be able to utilize the knowledge shared by peers, seniors, and teachers from all across the world.

Conclusion

The goal of undergraduate CBME is to create Indian Medical graduate possessing requisite knowledge, skills, attitude, values, and responsiveness so as to produce physician of first contact. Medical education is witnessing a significant transition in teaching learning methods and experiencing a global shift from offline to online teaching mode. Although teachers take double efforts for online teaching, the overall learning effect and the impact of traditional offline classes were much better than online classes. From traditional face-to-face offline teaching, students can get twofold results with half teacher efforts. Our study also depicts that online classes provide students with a sense of intent and routine in current pandemic situation so as to complete their curriculum. However, constraints encountered during online lectures are network problems, week signals that are difficult to reach students who live in the rural area, over excess storage of chat, files, pictures, lecture presentations that makes the cell phone memory full resulting in slow internet connection.

E-learning is paving its way into medical education and facilitators are devising newer methods to impart maximum knowledge to their students to overcome academic loss due to COVID-19 pandemic. With era progress and advanced technology, the ability of students to gain knowledge is far beyond our imagination. Injecting knowledge through blended offline–online modality in medical education can not only merely mobilize student's enthusiasm and interest but also enhance the interaction between teachers and students. Therefore, it is necessary to enhance the application of the online–offline interactive teaching method in medical education. The research on this newer method is still lacking due to intricacies in learning. However, still keeping all of these modalities in mind for effective learning of students in medical education, traditional offline teaching hasa greater impact on students' learning behavior, which cannot be completely replaced by online teaching. Hence, there can be blend of teaching modalities that can be used to deliver knowledge to the students. This overall exercise shall be utilized and incorporated for the betterment of students who are at the receiving end of the system. Innovative ideas can be incorporated for the blended teaching. Considering this as a gift of *newnormal* from the COVID-19 pandemic, we need to overcome the hurdles and utilize blended teaching modalities.

Authors contribution

All authors have accepted responsibility for the entire content of this manuscript and approved its submission.

Acknowledgements

We are thankful to Prof. Dr. Vikas Bhatia, Executive Director, All India Institute of Medical Sciences, Bibinagar508126, Telangana, India.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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