

Challenges of virtual classroom during COVID-19 pandemic: An empirical analysis of Indian higher education

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ABSTRACT

Higher education institutions (HEIs) usually work open throughout the academic session. In the COVID-19 pandemic time, all the HEIs were also closed temporarily. The study examined the major challenges faced by the teachers and students from the virtual classroom during the nationwide lockdown. Due to the nationwide lockdown and lack of funding, convenience sampling and snowball sampling techniques were used for data collection. A total of 893 responses were analyzed for this study. Data was collected through a structured questionnaire on a Likert scale from 305 teachers and 588 students of higher education institutes from the entire India. Network connectivity was the major challenge faced by the faculty members (mean value of 3.68) followed by 3.17 mean value for lack of professional environment at home, 3.03 for lack of teaching material at home, 2.92 for lack of personal computer/laptop. Lack of professional environment at home (mean value of 3.59) was the major challenge faced by the students followed by 3.57 for lack of teaching material at home, 3.35 for network connectivity, 3.31 for lack of personal computer/laptop. Virtual classrooms have challenges such as poor internet connectivity, non-availability of appropriate electronic devices, lack of a teaching environment at home, less information and communication technology (ICT) knowledge among students and teachers. It implied less engagement of students and teachers in the teaching and learning process.

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1. INTRODUCTION

The government of India announced a first countrywide lockdown on March 25th, 2020. It was for 21 days which was supposed to end on April 14th, 2020 but as the cases were increasing, the lockdown further extended till May 3rd, 2020. After that, it continued but Indian Government started giving relaxation regarding economic activities to open manufacturing sector, various government offices and other activities with rules and regulations regarding social distancing, wearing the mask, avoiding unnecessary travel. However, schools and colleges remain closed until September 2020 [1]. COVID-19 has disrupted the teaching-learning process of learners and teachers because of the closure of schools and colleges in the face-to-face mode. Many universities and colleges could not complete their classes and had to postpone the conduct of examinations. As per UNESCO [2], huge number of learners were affected due to the COVID-19 lockdown in India. COVID-19 disrupted learning, increased student debt, limited access to education facilities, increased job loss in the education sector, and reduced loss of learning among students.

Management of schools and colleges encouraged their students and teachers to continue the learning process through online teaching. In this technology-driven world, with the help of digital platforms such as Zoom, Skype, Google Meet, Microsoft Team, Google Classroom, and YouTube. Teachers and students can continue their teaching-learning process during this pandemic period [3].

Online teaching and learning could be advantageous as through which teachers can motivate students, complete syllabus, provide accessibility to learning and teaching from any time and any place. Various studies have been done to determine the challenges and drawbacks faced by teachers and students during online classes. Students' participation was less due to the lack of in-person conversations with teachers which could result in mental stress in students and teachers [4]. They also reported that an accessible and affordable internet connection was the main problem faced by students and teachers and less participation, interaction, and technical disturbance led to less engagement and disturbance in online classes. Teachers found technical, logistical, and pedagogical problems during online classes because of unprepared transition from face-to-face teaching to online teaching. More efforts were required from the teachers' side to ensure that students are studying the correct study material and provide information about the assignment.

Students opted for online education because it offered greater flexibility but required more self-discipline by students [5]. Student's perceptions in vocational studies on online mode stated that as vocational studies require not only knowledge but skills as well, online learning did not improve student's productivity, and also the experience was not up to expectation [6]. It provided motivation and there was ease in learning. They also concluded that students had easy access to resources but were unwilling to use them in the future. Business students' perception of using information and communication technology (ICT) in teaching and learning concluded that students were in support of using ICT facilities in teaching and learning as it might improve the efficiency of teaching and learning [7]. Impact of IT literacy of science students on learning achievement concluded that students' IT literacy did not improve their learning outcome as students would not use the internet for studies especially science students [8]. Students can also face difficulty in those subjects which require practical and laboratory experiments. Virtual classes can also increase the stress level of students and teachers [9]. Online learning has an adverse psychological effect on students and stated that students faced emotional disturbance and anxiety due to online teaching [10].

Although online teaching is helpful to maintain the continuity of the teaching and learning process it also requires various technological and infrastructural facilities for the smooth functioning of online learning and the limited availability of these facilities could affect the quality of education. So, a need for a study to be conducted to find out the challenges faced by teachers and students during these virtual classes. This kind of lockdown was implemented in the 1920s [11]. So, this was a big challenge for higher education institutions (HEIs). This study is considered by teachers and their respective students both. Other previous studies have focused on teachers and students separately [12].

Based on the explanation, following research questions were framed for the study: i) What are the challenges faced by the teachers and students of HEIs while shifting from face-to-face mode to virtual classroom during pandemic time? ii) How HEIs can reduce such challenges to improve the quality of the teaching learning process during the pandemic time?

The main objective of this study was to analyze the major challenges faced by teachers and students from virtual classrooms. There are several hypotheses of the study: There are no significant major challenges faced by teachers of HEIs from virtual classrooms (H01); There are significant major challenges faced by teachers of HEIs from virtual classrooms (HA1); There are no significant major challenges faced by students of HEIs from virtual classrooms (H02); There are significant major challenges faced by students of HEIs from virtual classrooms (HA2).

2. RESEARCH METHOD

For this study, we have considered the 893 total number of responses from teachers and students of HEIs of all the streams across the country using random sampling techniques. The questionnaire was shared from the University of Delhi campus, New Delhi to across the country through Gmail, WhatsApp, LinkedIn, Instagram. The lockdown was implemented across the country, so physical movement for data collection was not possible. The primary data was collected from July to September 2020. standard questionnaires [13] were adapted to design the questionnaire of the study. The Cronbach alpha reliability test has been used for the internal consistency of the questionnaire. The structured questionnaire for students was shared with 498 students of higher education institutes at all Indian levels. The structured questionnaire for students was shared with 5,000 students of higher education institutes spread across India. Out of which 946 responses were received from students with a response rate of 18.92%. After the data cleaning process, and removing of incomplete responses, only 867 responses from students were considered for this study. The structured questionnaire for faculty members was shared with 2,500 faculty members of higher education institutes

spread across India. Out of which 344 responses were received with a response rate of 13.76%. After the data cleaning process, and removing incomplete responses, only 335 responses from faculty members were considered for this study. The data has been received from national higher education institutes. Descriptive statistics and t-test were used in SPSS software to analyze the data collected through the primary source.

To know exactly what the major challenges are during virtual classrooms, we have used a 1-5 point Likert scale from strongly disagrees to strongly agree. We have given a list of major challenges on a Likert scale. Table 1 output is showing the SPSS software analysis results of internal consistency for each factor in our population. The Cronbach's alpha test of internal consistency giving value ≥ 0.7 is considered to be good. From the teacher's sample of this study, Cronbach's alpha value for challenges was 0.885 and from the student's sample of this study, Cronbach's alpha value for challenges was 0.879 [14].

Table 1. Reliability test

Factors	Cronbach's alpha for teachers	Cronbach's alpha for students
Major challenges	0.885	0.879

Source: SPSS output of authors data analysis

3. RESULTS AND DISCUSSION

3.1. Demographics of sample data

Table 2 shows the demographic results of the faculty members and students. Out of 305 faculty members, 51.34 % belong to the age group of "up to 30" years and 48.65% of faculty members were from the age group of ">30" years. Out of the total respondents, 68.65% of faculty members were female and only 31.34 were male faculty members. Among the total faculty members, 37.61% were with teaching experience of "0-3" years and around 40% of faculty members were having teaching experience of "4-10" years. Around 20% of faculty members were having more than 10 years of teaching experience. That means the majority of respondents were young and working on assistant professor, associate professor level [15].

Out of 588 students, 99.88% belonged to the age group of "up to 30" years and 0.11% of students were from the age group of ">30" years. Out of the total respondents, 65.62 % of students were female and 34.37% were male students. Out of the total respondents, 79.12% of students were studying at the undergraduate level and 18.10 % of students were studying at the postgraduate level as shown in Table 2.

Table 2. Demographics of respondent

	Total no. of teachers=305		Total no. of students=588	
	Number	%	Number	%
Age group (in years)				
Up to 30	157	51.47	588	99.88
>30	148	48.52	0	0.11
Gender				
Female	209	68.52	386	65.64
Male	96	31.47	202	34.35
Level of teaching/courses				
Only UG	180	59.10	465	79.12
Only PG	48	15.52	107	18.10
UG & PG both/other	78	25.37	16	2.76

UG=university graduate; PG=post graduate

3.2. Adoption rate of virtual classroom among teachers and students

Out of the total 335 faculty members, only 91.04% of faculty members were using the virtual classroom to interact with students for the teaching-learning process during the nationwide lockdown due to COVID-19 and 30 faculty members were still not using the virtual classroom to interact with students. Out of the total 867 students, only 67.80% of students were attending the virtual learning process during the nationwide lockdown due to COVID-19 and 32.20% of students were still not attending the virtual classroom as shown Table 3.

Table 3. Uses/adoption rate of virtual classrooms

Respondent's reply	Number of respondents	% (out of 335)	Number of respondents	% (out of 867)
Yes	305	91.04	588	67.8
No	30	8.95	279	32.20
Total	335	100	867	100

Source: author's data analysis output

3.3. Major challenges with virtual classroom

After the real experience of the virtual classroom during COVID-19 by teachers and students, there must be some challenges faced by them. From the output of data analysis of this study, we found that the network connectivity was the major challenge faced by the faculty members with a mean value of 3.68 followed by a 3.17 mean value for lack of professional environment at home, 3.03 for lack of teaching material at home, 2.92 for lack of personal computer/laptop. The least mean value of 2.38 has shown for the option “there is no lacking”. Here we reject the null hypothesis “H01”. Hence, we accept the alternative hypothesis “HA1” that indicates the majority of faculty members are facing challenges with network connectivity, professional environment at home, material, and personal laptop/computer.

From a student's responses, the lack of professional environment at home with a mean value of 3.59 was the major challenge faced by the students followed by 3.57 for lack of teaching material at home, 3.35 for network connectivity, 3.31 for lack of personal computer/laptop. The least mean value of 2.10 has shown for the option “there is no lacking”. Here we reject the null hypothesis “H02” and accepts the alternative hypothesis “HA2” that indicates the majority of students as shown in Table 4 are facing challenges with network connectivity, professional environment at home, material, and personal laptop/computer. The HEIs, Ministry of Education, University Grant Commission (UGC) need to fix the issues related to internet connectivity, internet infrastructure in rural India, lack of laptop/computer with poor family students, to enhance the teaching-learning process.

Table 4. Major challenges with virtual classroom

	Faculty members			Students		
	Freq.	% (out of 305)	Mean response	Freq.	% (out of 588)	Mean response
Lack of awareness	305	100	2.86	588	100	2.99
Resistance to change	305	100	2.76	588	100	2.98
Lack of training	305	100	3.07	588	100	3.16
Network connectivity	305	100	3.68	588	100	3.35
Lack of personal computer/laptop	305	100	2.92	588	100	3.31
Lack of professional environment at home	305	100	3.17	588	100	3.59
Lack of teaching material at home	305	100	3.03	588	100	3.57
There is no lacking	305	100	2.38	588	100	2.10

Various research studies have been done to know the challenges faced by teachers in online teaching. Instructors faced pedagogical challenges in designing a new curriculum, adopting a new teaching method, learning new interaction approaches, and new ways of assessment of the students for e-learning [16]–[19]. They observed that time management was the main personal challenge because of the more time and effort required to prepare e-content for e-learning. The instructor also encountered technology challenges because of a lack of technical literacy, network bandwidth, poor quality of audio/video, poor network quality, and lack of technical skills for communication [20]. These challenges faced by the instructor reduce the personal motivation of the instructor to adopt e-learning teaching. In a study of mathematics teachers observation regarding important barriers of online learning during the time of the COVID-19 pandemic examined 159 teachers and concluded that student barriers were the main obstacle for the teachers in e-learning implementation as less knowledge and skills of students regarding the use of e-learning device and there was also lack of accessibility to device and internet connection to students for e-learning [21]. They also found that school plays a very important role in conquering the problems faced by students in e-learning.

A study on the perceived barrier of online education of faculty found that: “i) interpersonal barriers because of less interpersonal relationship between students and teachers, impersonal teaching environment, and less interaction among the students; ii) institutional barriers as no specific rules and regulations for online courses; issue over property rights; low involvement of faculty in course decision making; iii) training and technology barriers as inadequate training to the instructor; less technology support; recurrent failures of technology; and rapidly changing software or delivery systems; and iv) cost/benefit analysis barriers as increased workload, more time is taken, less time for student assessment and feedback, and insufficient compensation for instruction” [22].

They also reported that barriers were more perceived by men than women in online education. Faculty with online teaching experience perceived fewer barriers than those who did not have online experience. Online teaching can have challenges such as poor internet connectivity, non-availability of appropriate electronic devices, lack of a teaching environment at home, less ICT knowledge among students and teachers can result in less engagement of students and teachers in the teaching and learning process [23]. One of the study found that “poor digital skills of teachers and students, school policies, lack of electricity facilities, less availability and accessibility of internet, connection issues, and inadequate facilities, training,

funding, and non-acceptability of technology were the barriers of online education at the time of closure of schools due to COVID-19 pandemic” [24].

These are the examples of digital platforms available at the national level in India “Webs of Active Learning for Young Aspiring Minds” (SWAYAM), “SWAYAM Prabha”, “the National Digital Library of India” (NDL), “Free and Open Source Software for Education” (FOSSEE), Online MOOC courses, On Air–Shiksha Vani, Digitally Accessible Information System (DAISY), e-PathShala, e-PgPathShala National Repository of Open Educational Resources (NROER) to develop e-content and energized books, telecast through TV channels, E-learning portals, webinars, chat groups, distribution of books [25].

As of now, all these digital platforms were used as an additional facility to improve the teaching-learning process in higher education and they were extensively used free of cost by the students during the pandemic time. Due to the COVID-19 pandemic, many HEIs are able to conduct classes, evaluation, and admission-related work completely in virtual mode. So, this pandemic has given an exposure to the HEIs. Now the HEIs, Ministry of Education, UGC, all India council for technical education (AICTE) are in better understanding about virtual teaching-learning implementation benefits and challenges [26].

In HEIs, to improve the quality of blended learning with the help of digital platforms the UGC [27]–[30] on May 29th, 2020 has issued a public notice asking for suggestions from stakeholder on permission to be granted to HEIs to teach up to 40% of the syllabus of each course (other than existing platform SWAYAM course) through online mode and remaining 60% could be taught in offline mode, which is currently 100% in offline mode as per the existing regulations.

4. CONCLUSION

Due to the COVID-19 lockdown implemented, HEIs were closed in the physical form and face-to-face mode classrooms. They have been replaced by virtual classrooms. This was the only solution to decrease the losses in the education sector. Due to the challenges, the effectiveness of the virtual classroom is not meeting the expectations. The challenges related to network issues faced by the faculty members of HEIs were lack of professional environment at home, lack of teaching material at home, lack of personal computer/laptop. Challenges faced by HEIs students are lack of professional environment at home was the major challenge faced by the students followed by lack of teaching material at home, network connectivity, and lack of personal computer/laptop.

The HEIs need to fix the issues to enhance the teaching-learning process by solving the network issues faced by the faculty members of HEIs, by helping to ensure professional environment at home, facilitate personal computer/laptop. To meet the expected results, the HEIs should work on limiting the drawbacks and challenges consistently. HEIs need to fix the issues to enhance the teaching-learning process by solving the network issues faced by the students of HEIs by helping to ensure professional environment at home, availability of teaching material at home, and facilities of personal computer/laptop. The results of this study can contribute to the HEIs, Ministry of Education, UGC in meeting with the challenges being faced by the students and faculty members of HEIs.




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