

## **ONLINE TEACHING DURING COVID-19 LOCKDOWN PERIOD: CHALLENGES AND RESPONSES IN HIGHER EDUCATION IN INDIA**

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### **ABSTRACT**

During this pandemic 'Covid-19' a web based online study was conducted in the month of April 2020, during amidst lockdown period in India. The study was designed for students, pursuing higher education (graduation and above) as well as for the teachers, undergoing online classes. In order to collect the data for this study, a user-friendly Google form was designed, containing questionnaire in English to be taken by respondents studying in various colleges and universities in India. The survey was administered online. As the respondents entered their responses to questions, the results were directly recorded into a database. The findings of the study reveals that the online classes were found useful for science students (90.7%), followed by arts (88.6%), commerce (83.8%), and medical students (74.9%). Further, it was recorded that online classes were useful for post graduates students (90.3%) followed by graduates (78.4%). The statistical analysis (using SPSS version 24), predicts that students who studied in government/ government aided colleges were 1.698 times more likely to consider online classes useful [OR = 5.461 (1.147- 25.994),  $p < 0.033$ ; as compared to the private institutes. Similarly, 73.2% of the students who have not done any previous training, for studying online class, found attending online class as useful along with 26.8% students with previous training ( $p < 0.016$ ). However, overall, 74.1% of the teachers agreed that in absence of online teaching, student's learning would have been seriously affected during COVID 2019 lockdown, and almost half of the teachers expressed their willingness to continue teaching online, even after lockdown.

**Key Words:** Covid-19, Online classes, Teacher attitudes/perception, Student retention, Higher education

### **Introduction**

In view of the Covid-19 outbreak all across the world, everyone is taking all precautionary and preventive measures to combat this pandemic. The school, colleges, universities and workplaces have been shut down to avoid the spread of this novel virus. This was supposed to influence the students learning process to a great extent but because of the various digital technologies, it

couldn't happen. There are several ICT initiatives of the MHRD, UGC and its Inter University Centres (IUCs)-Information and Library Network (INFLIBNET) and Consortium for Educational Communication (CEC), in the form of digital platform which can be accessed by teachers, students and researchers in the universities and colleges for broadening their horizon for learning. Some of the important ICT initiatives includes **SWAYAM** online courses, UG/PG MOOCs, e-PG Pathshala, e-Content courseware in UG subjects, SWAYAMPBHA, National Digital Library, Shodhganga Government has taken various initiatives, to enable online teaching-learning process, even at this time. Students can be in constant touch with their faculties with the help of online classes conducted through Skype, Zoom, google hangouts, Google classroom etc.

Further, as per the NSSO survey of 2017-18, nearly 45 percent of India's population above 15 years of age is either illiterate or has just attended formal primary education. In rural India, almost 70 percent of people above 15 years of age are either "not-literate" or have education only till middle school. This section may not have the required level of education to teach their children at home. Even though internet-based teaching is the most appropriate stop-gap arrangement now, it has highlighted the inequalities in the education system. A majority of the student population is being left out in the pursuit of basic education.

However, infrastructure readiness has to be assessed in terms of household assets ownership versus school facilities during lockdown. The National Statistical Organisation (NSO) 75th Round survey on 'Social Consumption of Education in 2017-18' had probed households' ownership of computers and access to the internet. The computer was a catch-all for devices like desktop, laptop, notebook, netbook, palmtop, tablet (or similar hand-held devices). Specifically, the smartphone was not included in this list. Further, the survey probed if a household member of age five years and above had used internet to find, evaluate and communicate information from any location during the last 30 days preceding the date of survey, via any of the above-mentioned devices, and smartphone, etc. In the top two urban quintiles, 68.3 per cent and 50 per cent of households had internet access, respectively. This number was 18 per cent in the bottom-most urban quintile. Twenty-nine per cent of households had internet access in the top-most rural quintile and 5.7 per cent in the bottom-most quintile.

The Indian youth are also characterised by limited digital skills. Only 17.6 per cent of the youth could use a computer and 18.4 per cent could access internet. As per the NSO (2019), the ability to use internet meant that the household member was able to use internet browser for website navigation, using e-mail and social networking applications, etc., to find, evaluate and communicate information. Therefore, relatively speaking, only the top most urban quintiles in India are the readiest for online education. State/UT education policy during the lockdown needs a more egalitarian means of delivering education

The current crisis has acted as a fillip to encourage digital education. According to India's demographic profile in 2018, around 35.3% of the population are under 14 years old, which means that in the next 20 years they will all be working and have completed their education. Although India has many universities and colleges, only few have the facilities to match this surge of students in the future. Online education could be a logical solution to accommodate this problem. The government of India, for the first time, is allowing Indian universities to offer online degrees which previously were limited to foreign universities. Now, to encourage and widen the access to higher education, this restriction has been lifted from 20% to offer 100% courses online.

Keeping these views in mind, the present study have been designed in a way to assess facilitators and barriers faced by teachers and children during online teaching. Further, based on the teaching experiences; suggestions were also invited, so that appropriate solutions can be sought to strengthen the online learning.

## **Methodology**

A web based online study was conducted in April 2020, during COVID 19 lockdown period in India. The study was designed for students, pursuing higher education (graduation and above) for teachers undergoing online classes. In order to collect the data for this study, a user-friendly Google form was designed, containing questionnaire in English to be taken by respondents studying in various colleges and universities in India. A multi-item questionnaire was created based on a comprehensive literature review (to ensure face validity) and based on expert suggestions (to ensure content validity). The Google form includes two sections. Part 1 included personal information's and information related to online teaching practices. Part 2 was the consent form. The Google forms were sent through e-mail and WhatsApp to various students and

teachers, using a specified URL, and were requested to share it among their and groups/colleagues. The questions were of varied format including checkbox, multiple selection, open and close ended questions. The survey was administered online. As the respondents entered their responses to questions, the results were directly recorded into a database data table. The questionnaire could be taken only once on computers and mobile phones with all anonymity and privacy conditions for data provided upfront to potential study participants. A maximum of 2 Reminder were sent, within a week from the moment they were first contacted and another a week later, to those known respondents who had not responded to the survey.

### **Observations and Data analysis**

After completing data collection, the data was exported from spreadsheet to statistical package for social science (SPSS) version 23 and checked for missing values. The data is coded and analysed. Descriptive analysis was done for each predictor value. Cross tabulation was also done to see the distribution of different variables in relation to outcome variable. P-value <0.05 was used to consider significant variables. Results were described by texts, tables and figures.

### **Result and Discussion**

#### **a) Student's online learning experiences analysis**

##### **i). Personal and educational information**

A total of 564 students participated in the web study, which includes 319 females (56.5%) and 245 males (43.5%). Among these participants, 343(60.8%) were graduate, 185 (32.8%) were post-graduates and 20 (3.5%) were PhD students. Further, it was recorded that 93.4% of the students were studying in Government/ Government aided colleges. Out of which 45.2 % belongs to medical/ dental; 28.3% from science; 12.4% from arts; 6.6% from commerce and 7.3% representing others including law and management.

##### **ii). Features of Online classroom**

###### **• Experiences and practices**

The finding shows that 83.9% students were attending online class for the first time, and the gadgets commonly used were smart phones (91.8%) followed by personal computer/ laptop 13.1% and Tablet/ iPads 4.9%. Among various applications used during the online classes; Zoom meeting app was the most popular application, with 68.4% users followed by Google classroom

14.2%; Google meet 20.6%; and Teach Online 3.2%. However, 13.1% of the students have used other applications viz., WhatsApp, Microsoft team and Google cloud. The finding also recorded that only one- fourth of the students had the previous experiences of online classes.

**Table -1: Distribution of students based on educational and online class related factors**

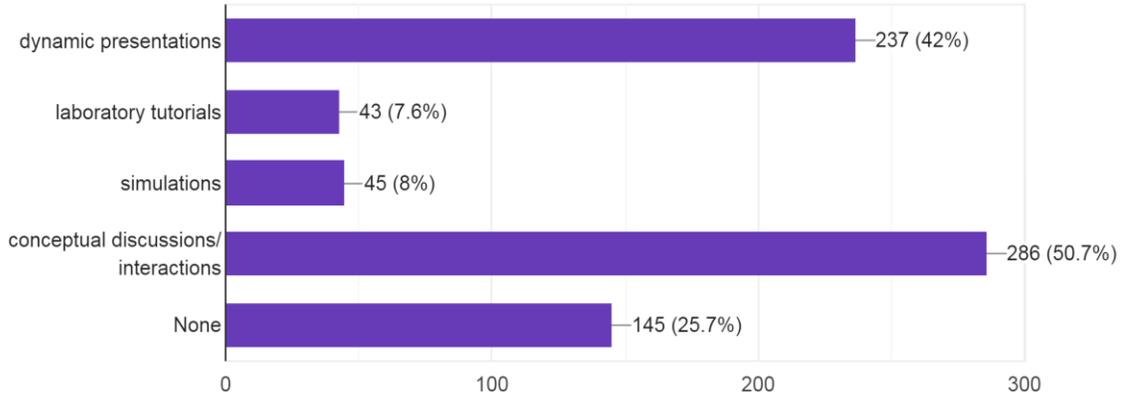
S. No	Demographic features (n= 564)	Frequency	Percentage
	<b>Gender</b>		
	• Female	319	56.5
	• Male	245	43.5
	<b>Course</b>		
	• Graduation	343	60.8
	• Others	16	2.8
	• Ph D	20	3.6
	• Post-graduation	185	32.8
	<b>Faculty</b>		
	• Arts	70	12.4
	• Commerce	37	6.6
	• Medical/ Dental	255	45.2
	• Others	41	7.3
	• Science	161	28.5
	<b>Institute Type</b>		
	• Government	527	94.0
	• Government aided	27	5.0
	• Private	10	1.
	<b>Attending online classes for the first time:</b>		
	• No	91	16.1
	• Yes	473	83.9
	<b>Gadgets used</b>		
	• Laptop	74	13.1
	• Smart phone	517	91.8
	• Ipad/tablet	28	4.9
	<b>Application used</b>		
	• Zoom	384	68.2
	• Google meet	117	20.8
	• Google classroom	80	14.2
	• Teach online	18	3.2
	• Others	74	13.1
	<b>Training/short briefing/demo for online classes</b>		
	• No	424	75.2
	• Yes	140	24.8

	<b>Various pedagogical strategies to make the online class more interactive</b>		
	• dynamic presentations	237	42.1
	• Laboratory tutorials	43	7.8
	• simulations	45	8.0
	• Conceptual discussions/interactions	288	51.1
	• None	144	25.2
	<b>In absence of online classes, students' learning was seriously affected during COVID 2019 lockdown</b>		
	• Yes	384	68.6
	• No	71	12.0
	• Not sure	109	19.4
	<b>Difficulties faced during online teaching classes</b>		
	• Internet connectivity problem	452	80.3
	• Surrounding Disturbances	171	30.4
	• Unable to use application for online class	60	10.7
	• Disturbance in audio/voice	273	48.5
	• Disturbance in video	175	31.1
	• Others	65	11.5
	<b>Issues related to content</b>		
	• Unable to clarify doubts	174	30.9
	• Felt isolated and disconnected	135	24.0
	• Distractions are caused by irrelevant online comments	146	25.9
	• Poor student teacher interaction	179	31.8
	• Monotonous/boring	143	25.4
	<b>Perception regarding usefulness of online classes</b>		
	• Useful	466	82.6
	• Not useful	98	17.4
	<b>Whether continue to learn via online classes even after the lockdown withdrawal</b>		
	• Yes	232	41.0
	• No	208	37.1
	• Not sure	124	22.9

**Figure-1:**

The lecture includes various pedagogical strategies to make the online class more interactive, such as (multiple choice)

564 responses



Note: Among students pursuing higher education who reported various methodologies used for teaching during online classes (Percentages may not add to 100 due to multiple responses).

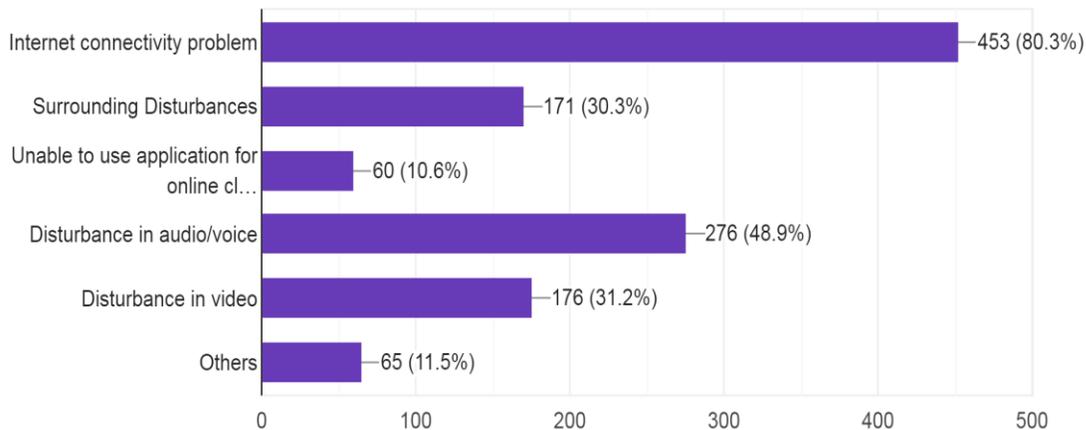
The observation shows that various pedagogical methods were used by the teachers during online classes. It includes conceptual discussions/interactions (51.1%), dynamic presentation (42.1%), Lab tutorials (7.9%) and simulators (8.0%).

- **Challenges faced during online classes**

**Figure-2:**

### Difficulties faced during online teaching classes (multiple choice)

564 responses



Note: Among students pursuing higher education who reported various difficulties during online classes (Percentages may not add to 100 due to multiple responses).

However, while observing the difficulties during online classes; it was recorded that internet connectivity problems, disturbance in audio- visual signals, disturbance in surroundings, difficulty in using applications and some others technical issues viz., discharge of gadgets/ laptop or phone were the major problems faced by the students. Besides this, inability in clarifying doubts, poor student teacher interactions, felt isolated and disconnected, boring/ monotonous classes were the other issues influencing the learning behavior of the students. Eye exertion, causing eye burn, family interruptions, difficulty in studying conceptual topics without books and face to face interactions were the other important issues raised by the students, during the online survey.

#### • Perceptions related to online classes

Overall students have the same opinion that they have got benefitted from online teaching.

Besides this, 68.6% of the students favored that, in absence of online teaching; student's learning would have been seriously affected during COVID 2019 lockdown.

Less than half of the students (41.0%) showed interest in learning through online classes even after the lockdown withdrawal.

**Table 2: Factors associated with perception regarding usefulness of online classes among students**

Factors		Perception regarding usefulness of online classes (n= 564)		
		Useful	Not useful	p-value
<b>Previous Training</b>	<b>Yes</b>	125 (89.3) [26.8]	15 (10.7) [15.3]	0.016*
	<b>No</b>	341 (80.4) [73.2]	83 (19.6) [89.7]	
<b>Faculty</b>	<b>Science</b>	146 (90.7) [31.3]	15 (9.3) [15.3]	<0.001**
	<b>Arts</b>	62 (88.6) [13.3]	8 (11.4) [8.3]	
	<b>Commerce</b>	31 (83.8) [6.7]	6 (16.2) [6.1]	
	<b>Medical</b>	191 (74.9) [41.0]	64 (25.1) [5.3]	
<b>Institute type</b>	<b>Government and Government aided</b>	462 (83.2) [99.1]	93 (16.8) [94.9]	0.010*
	<b>Private</b>	4 (44.4) [0.9]	5 (55.6) [5.1]	
<b>Courses</b>	<b>PhD</b>	19 (4.1) [95.0]	1 (1.0) [5.0]	0.001**
	<b>Post-graduation</b>	167 (35.8) [90.3]	18 (18.4) [9.7]	
	<b>Graduation</b>	269 (57.7) [78.4]	74 (75.5) [21.6]	
	<b>Others</b>	11 (2.4) [68.8]	5 (5.1) [31.3]	

(Row %) [Column%] \*p < 0.05, \*\*p < 0.001

Online classes were found useful among the students who have received training before attending it (88.6%). It was found useful for science students (90.7%), followed by arts (88.6%), commerce (83.8%), and medical students 74.9%). Government and Government aided institute (83.2%) have found online classes useful as compared to private institutes. PhD students (95%) found online classes useful, followed by post graduates (90.3%) and graduates (78.4%).

Binary logistic regression analysis was used to compute predictors of online class usefulness using various study variables. The model predicts that students who studied in government/ government aided colleges were 1.698 times more likely to consider online classes useful [ OR = 5.461 (1.147- 25.994), p< 0.033. Similarly, 73.2% of the students who have not done any

previous training, for studying online class, found attending online class as useful along with 26.8% students with previous training ( $p < 0.016$ ).

### **Teacher's online teaching practices analysis**

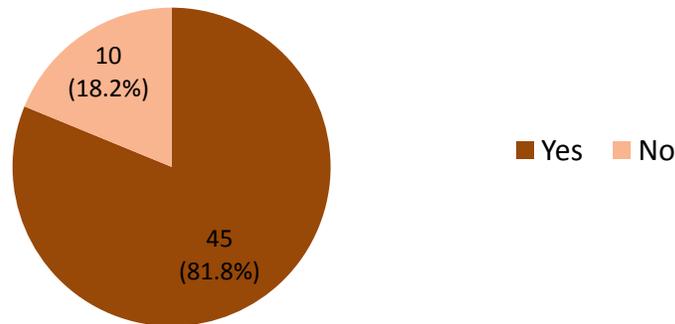
Similarly, while doing the assessment of teacher's online teaching practices during COVID-19 lockdown period; we have got the response of 55 teachers only. Out of which, 44(79.6%) were the male and 11(20.4%) were the female teachers at different capacities including Assistant Professor (59.6%); Associate Professor (14.8%); Professors (9.3%) and others (14 %) viz Scientists & Principals. These faculties/ scientists were representing different government colleges/ universities (66.7%), government aided colleges (20.4%) and private colleges (9.3%) situated in various urban localities. Further, the observations recorded that majority of the faculties belongs to Science stream (75.9%), followed by Arts (5.6%), Commerce (3.7%), Medical (9.3%), Law and Management (5.6%) streams.

While, observing their teaching experiences; it was recorded that 61.1% of the faculties had less than 10 years teaching experiences, 29.6% had 10-20 years experiences, and 9.3% had more than 20 years of teaching experiences. However, in terms of previous online teaching experience's, majority of the teachers (77.8%), were doing online teaching for the first time; utilizing personal laptop/computer (66.7%), smartphone (55.6%), institutional computer/ laptop (9.3%) etc for taking online classes, and around 61.1% of the teachers agreed that this kind of teaching involves heavy workload.

Furthermore, it was recorded that majority of the teachers had used Zoom meeting app (72.2%), followed by Google classroom app (25.9%), Google meet (11.1), Teach online (7.4%) and others (33.33%) viz., Microsoft tech, WhatsApp, Video calling, ePathshala; for delivering the lectures/ classes.

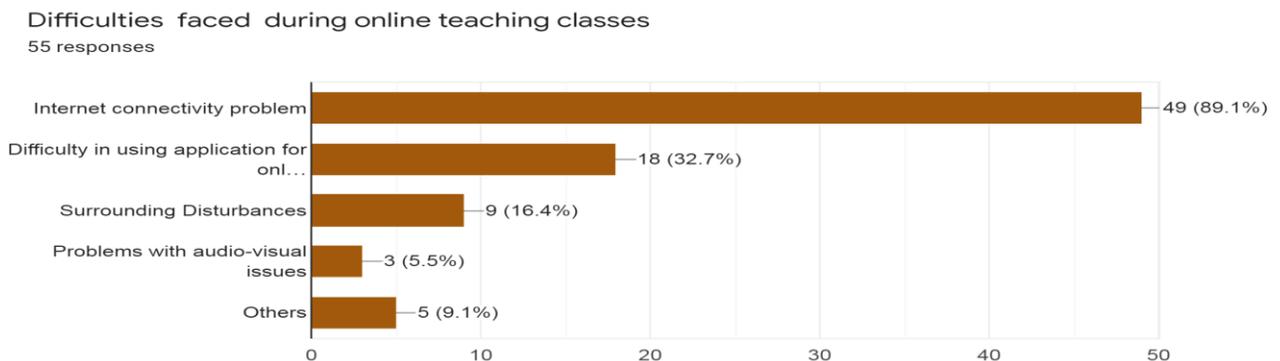
Note: As per the teacher's perception, in face to face classroom, instructor takes their cues from students' verbal and non- verbal interaction in classroom. However, it is difficult to take these affective cues when faculty is unable to see their students' faces.

Figure 3: Teachers perception during online classes  
55 responses



The most preferred pedagogical strategies used by the teachers was conceptual discussion/ interaction (68.5%), followed by presentations/ you tube videos (37%), lab tutorials (5.6%) but 13% of the teachers did not used any of these methods, as mentioned above. Besides this, 81.8% of the teachers also consented that in face to face classroom teaching, teachers take cues from the student’s verbal and non-verbal interactions; however, it is difficult in online classes. Further 85.2% of the teachers expressed that in online classes, teacher is unable to make any assumption regarding student’s ability to use technology, and also faced the problems of internet connectivity (88.9%), difficulty in using application (33.33%), surrounding disturbance (16.7%), audio-visual issues (5.6%) and other technical difficulties (9.3%).

**Figure-4:**



Note: Among teachers providing higher education who reported various problems experienced during teaching online classes (Percentages may not add to 100 due to multiple responses)

Overall, 74.1% of the teachers agreed that in absence of online teaching, student's learning would have been seriously affected during COVID 2019 lockdown, and almost half of the teachers expressed their willingness to continue teaching online, even after lockdown.

**b) Response/ Suggestions, as received**

**• Classroom teaching Vs online teaching**

Class room teaching and online teaching, both have their merits and demerits. As one of the teachers suggested "online classes definitely acted as a catalyst to start daily routine studies that were stopped due to lockdown. Further, it is going to reduce our burden when the college will reopen because we will not have to cover that entire ocean of syllabus in just few days for exams, hence, it is good. But, it can't match live classroom studies and lectures. Therefore, once the conditions will become normal and safe; the classroom teaching should be started again, as usual". Further, a teacher suggested that "interactive teaching and on-board teaching is paramount form of teaching and learning for teacher and students both. Though, technologies may bring information addition to learning procedures. The bondages built-in during such an interactive teaching is amazing, and no substitute to face to learning procedures". Similarly, another teacher suggested "it is difficult to assess whether students have understood or not, as well, whether they are actually studying or not". However, on the other hand, few students had the opinion that "time limit influence the teaching process; the classes are not as interactive as it should be as well as can't concentrate in online classes as compare to regular classes". Another student have the opinion that "online classes have several demerits, but at this point of time, this is the best possible option that we can adopt". Further, a group of students have the opinion that "online teaching is good but not better than classrooms. They usually preferred that lecture videos should be uploaded because of many reasons viz., no timing problem; can be access multiple times to understand better; internet problems can be short-out up to certain extent; no voice breaking or asynchronization of audio- video". Similarly, another group of students have the same opinion that online lectures must be available at the college/ university website for free access, so that, students can get the advantage, even if they had missed the classes or want to revise the lecture again and again". Sometimes, internet connectivity affects the online classes, hence, the lectures (PDF/PPT) should be mailed to the students group, so that, they can get the actual benefit of the class". Besides this, a group of students have the opinion that teachers should arrange post lecture sessions, to clear the doubts of the students as well as should provide

the assignments, so that, active participation of the students can be made more professionally. Online classes should be with demonstration especially for science faculty.

- **Availability of basic infrastructure requirements**

For e-learning, resources that are required need to be addressed. As suggested by a Senior teacher that “Universities require high-speed internet and education delivery platforms or learning management systems, besides stable IT infrastructure and faculty members who are comfortable teaching online. Students also require high-speed internet and computers/mobiles to attend these live classes or watch pre-recorded class videos”.

- **Professional development**

Adequate training of teachers in using technology as well as strategies which are appropriate for online teaching is essential. Similarly students must also receive some basic training related to participation in online courses.

A young teacher commented that teachers and students need more training and exposure for advancement in technology, as we face many technical problems during online classes, not easy to handle online classes. Few students also commented that “old teachers don't know how to use apps. They are too old for this kind of technology. Some are just reading the slides which make learning monotonous and boring. Hence various interactive methods must be used to make classroom interactive and informative, so that students get interest in learning and participate in learning”.

- **Insecurity in Zoom class**

As commented by a student; “There is a big problem related to data insecurity, which also needs to be addressed as it creates problem in e learning”. Few other students also had doubts related to safety issues. Their apprehension was expressed as; “Our teachers use zoom app, then we have to use the same app while we know that zoom app has issues related to safety measures. We students are concerned about our data theft and its misuse. In this situation who will take the responsibility Zoom is not safe for online classes”

- **Resource and internet connectivity related challenges**

One of the main challenges for e learning in India is poor internet connectivity in rural areas. Also few students commented that “lots of students are from rural areas that are unable to participate in online classes because of different constraints/ limitations”. Further, majority of the students live in villages and rural areas are not always having good internet connectivity and

problem of irregular electricity supply. Besides this, majority of the students are also from the poor background; hence, cannot afford smart-phones and are not always in a position to pay for mobile data pack. However, many of the students from urban areas also mentioned that online classes are good but due to poor internet connectivity they have to rush here and there in search of better connectivity.

- **Health issues**

Some of the students have also reported various health issues, out of which, eyes straining and headache were the major problems. They were of the opinion that the classes should have longer breaks in between, so that, their eyes can get proper rest. Besides, increased screen time causes sedentary behavior, decreased metabolism, disturbance in sleep cycle, more distractibility and perhaps lower well-being.

According to a recent study in a global level online learning program, after the United States; India has been reported to have the second highest number of online course enrolment with more than over 1,55,000 students from the country (Bhongade and Sarode 2018). In higher education, there is a growing demand to create a virtual learning environment (VLE) in which all aspects of a course are handled through a consistent user interface throughout the institution. Some of these programs are initiated in our country and students need to attend orientation sessions in colleges, but the course content is delivered online. Several universities do offer online student support services, such as online advice and registration, e-counselling, online textbook purchase and student newspapers.

The problem of non availability of adequately qualified teachers in rural areas can be overcome by e learning. Through live online tutoring; streaming videos and virtual classrooms such problems can be handled. Although there is no substitute for effective and organized classroom teaching, however e-learning's is the best option. Drop out students can be taught through e-learning as they feel insulted to go to school again.

Similarly, digital India programme introduced by government of India is important for the development of digital education in the country. Government of India has initiated Digital India drive for creation of digital empowered society across the country. It will help in mobilizing the capability of information technology across government departments and helps in delivering the different governments programs and services. Digital India helps in creating job opportunities, providing high speed internet and so forth. It has three components namely digital

infrastructures, digital delivering services and resources and digital education (Jani and Tere, 2015).

Further, different issues, trends and challenges of digital education in India (Dua et al., 2016) suggests empowering Innovative classroom model for learning. The future trend of digital education includes digitalised classroom, video based learning, and game based learning and so forth. They have pointed out challenges during e learning India and suggested measures to overcome these challenges. Constant reforms required in schools and teacher for the development of digital education in India.

There are different opportunities and challenges of digital India programme (Goswami, 2016). It helps in transforming country into a digitally empowered economy and in integrating the Government Departments with the people of India. This programme will help in reducing the paper work and in providing various Government services digitally to the citizens. It provides different opportunities for the people of the country. There are different languages, culture, and customs, food habits, laws and traditions in India. The purpose of this programme is to integrate our country digitally but different regional languages would be the main challenges in the implementation of such programme.

Similarly there are many web based tools (Patel, 2017) which can be used in the classroom for digital education like twitter, Glogster, Prezi, Diigo, Dropbox and Moodle. Teachers and students are interested in web based digital learning but because of lack of knowledge they are not initiating the same. Web based tools make the learning more interesting for the students. Similarly, teachers with use of digital technology can make even boring content interesting and joyful for students

However, in the current study; it was recorded that online classes were more useful for the students, who had already certain experiences/ trainings, before attending the online classes (88.6%). Further, it was useful for postgraduate students (90.3%) than graduate students (78.4%); having the science streams (90.7%), followed by arts (88.6%), commerce (83.8%) and medical (74.9%) backgrounds. Furthermore, it was also recorded that online classes were more useful among the Government and Government aided institute (83.2%) as compared to the private institutes. The statistical analysis showed that students who studied in government/ government aided colleges were 1.698 times more likely to consider online classes useful [OR = 5.461 (1.147- 25.994),  $p < 0.033$ ].

## **Conclusion**

Information and technology has resulted in emergence of globalization of knowledge, through online learning in higher education system. However growth of E- learning is at a low rate in India, as compared to the international market, where it is being used at all levels. Further, as recorded in the current study, majority of the students who have not done any previous training for studying online class found attending online class as useful along with students with previous training. Similarly majority of the teachers agreed that in absence of online teaching, student's learning would have been seriously affected during COVID 2019 lockdown, and almost half of the teachers expressed their willingness to continue teaching online, even after lockdown. Thus, Covid-19 pandemic has provided the opportunity of learning and educating others and at the same time, highlighted the needs for academics to adapt to this change, both by way of teaching and the assessment process.

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## **Statements on open data, ethics and conflicts of interest**

- a. In view of confidentiality of data, the data analysed in this study is not available to the public. However access to the database are available from the corresponding author on reasonable request.
- b. Participants took part voluntarily after reading/ going through the Part 1 of which included the written consent. The data was collected in accordance with data protection policies and prior to storage and analysis, the data were anonymised.
- c. The authors declare that, were no conflicts of interest among them in this study.

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