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Dr. Bakhteyar Ahmad

Assistant Professor, Manuu,
College of Teacher Education,
Asansol, Danishgah School
Campus, Asansol,
West Bengal, India

Impact of COVID-19 on the access use and development of ICT skills and online learning: A study of prospective teachers in India

Bakhteyar Ahmad

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Abstract

The present study is an effort to look into the impact of COVID-19 on the use awareness of ICT and development of online teaching/learning skills among the prospective teachers. 206 students belonging to 20 universities/colleges from 13 Indian states finally constituted the sample for the study. Data was collected the help of a questionnaire which was provided to them through a Google form. Content analysis of the open ended items was done. The findings reveal that many students who were using simple mobiles before lock downs have now started using smart mobiles and laptops because of online classes and activities. The findings reveal the digital divide between the students doing teacher training. An extreme up-rise was seen in the use of e-gadgets and time spent on mobiles for educational purposes. The students have reported a long list of skills, learnt and experienced during lock down. Asked about the Personal Experiences the students reported problems such as network connectivity, electricity problems and serious health related problems while using smart mobiles for online learning for longer durations. The limitations such as ICT being monotonous, lacks peer interaction, lack of co-curricular activities, problem of proper space at home and costly data packs were reported. The positive aspects being responded by the students included ICT being flexible, gave freedom of space, place and time, suitable during crisis, access and search of information quickly.

Keywords: COVID-19, Information and Communications Technology (ICT), online learning, information quickly

Introductions

The Government of India launched its futuristic 'Digital India Campaign' in July 2015 with the objectives of connecting rural areas in the country with high speed internet networks, improving digital literacy central towards three key areas i.e. digital infrastructure as a utility to every citizen, governance and services on demand and digital empowerment of citizens. About five years of its implementation the world encountered a pandemic that influenced almost all corners of the world all sections of society and all domains of human lives. The first case the Corona Virus Disease 2019 commonly known as COVID-19 in India was found on 30th January 2020. Within months India became second to United States with regard to number of confirmed cases. Till September 2020 India became first country in the world with over 90000 reported cases per day. Education being a very crucial sector is one that was severely affected by this pandemic. A countrywide lock-down of schools and colleges for the first time in the history of the country was declared by the government of India on March 16, 2020 (UGC 2020) ^[15]. The whole teaching learning process ranging from nursery to Ph.D. level suddenly confined within the boundaries of home.

All educational institutions whether planned or unplanned were left with choices either to go online or to stop/shut their educational activities. It was this time the digital India campaign launched earlier proved vital and enabled the country to continue teaching learning online. The immense potentialities of information communication technology was largely seen and experienced. Most universities across the country successfully completed their two academic years in regards to most of the courses with the help of the digital devices when the country remained locked, learners and teachers confined within their homes most of the time. In July 2020 when final draft of National Education Policy 2020 was approved a new section titled 'Online and Digital Education: Ensuring Equitable Use of Technology' was added in the previous draft of NEP 2019 (ASER 2021) ^[5].

Corresponding Author:

Dr. Bakhteyar Ahmad

Assistant Professor, Manuu,
College of Teacher Education,
Asansol, Danishgah School
Campus, Asansol,
West Bengal, India

The policy stressed the need to eliminate digital divide in order to take maximum benefits of online and digital education. It also highlighted the need of digital infrastructure in the country. It also stressed incentives for teachers for blended and online teaching, content creation and digital repository etc. UNICEF and UNESCO (2021) ^[17] in their combined report claimed that the sudden transformation of conventional learning into e-learning because of the COVID-19 pandemic has exposed the digital divide and inequity in the education system and needs to be addressed as the same has been promised in National Education policy 2020.

India in its 75th years of independence while celebrating 'Azadi Ka Amrit Mahotsav' has more than 30 crores school and college going children studying in its more than 15 lacs schools, 40 thousand colleges and about a thousand universities. As per a report published in The Hindu India in February 2022 became the second country with longest duration school closure because of COVID-19 (Hamid and Poorvaja 2022) ^[6]. Sudden transformation of such huge mass of learners and teachers into online mode without much planning was not at all an easy task, particularly in the backdrop of the logistics available and expertise with the Indian teachers in general (Ahmad 2022) ^[2]. It is in this context that the investigator based on his personal experiences with the students during these pandemic years made an effort to look into the way this pandemic has impacted the learners going online and using ICT in their teaching learning and training.

Review of literature

WION (2021) in its report refers to a research according to which about 40 to 70 percent children in the country remained without access to a gadget making online schooling woefully insufficient. In another study by NCERT (Sengupta 2020) ^[13] it was found that about 27% students studying in CBSE NVS and KVS do not smart phones or laptops. The situation of these schools is enough to understand the pathetic condition of other schools in the country. According to a report published by ASER (2021) ^[5] in the year 2021 63% government school going children do not have a smart phone. It was that very time when students were confined within their homes and complete closure of schools was in force. Another research reveals (Ahaskar 2020) ^[4] that about 79% Indian students are relying on smart phones for their online classes which is not advisable for long duration classes and may be leading to a number of health and other complications. A standing committee of parliament reported problems of access and quality internet connectivity to approximately 70% of Indians (UNICEF 2021) ^[17].

A study conducted by Azim Premji Foundation (India Today 2021) about 60% children cannot access online opportunities of learning. In another study about half of the urban parents reported issues of network connectivity and speed with their children. Many parents were also facing the problem of costly mobile data. Mobile phone related issues and network connectivity problems to about half of the students was also claimed in a study by NCERT (Sengupta 2020, Arora and Srinivas 2020) ^[13, 4]. UNICEF (2021) ^[17] claimed only 24% houses in India had internet facility before COVID-19 pandemic. Problem of electricity is a big hindrance behind smooth online teaching and learning (Kaul 2020, Sengupta 2020) ^[13].

About 80% teachers in a study published by Boston Consultancy Group (WION 2021) claimed maintaining emotional connection during online education is impossible. Online teaching requires proper training, lacks personal touch (Sudevan, 2020; Almaiah *et al.*, 2020) ^[14, 3], is exhausting and demotivating, hampered by external noise and family interruption at home (Press Trust of India, 2020) ^[12] and fails sustained academic engagement of students (Kaup *et al.* 2020) ^[11]. According to Observer Research Foundation (Kalra and Jolad 2021) ^[9] remote learning with digital support has been less effective in comparison with the classroom learning even with the best logistics.

In its survey NCERT reports that about 70% respondents which included students, teachers, school authorities and parents found online teaching and learning enjoying during COVID-19 lockdown. Despite all challenges, online learning has features of being flexible and gives liberty from strict classroom disciplines.

The study

In July 2020 when final draft of NEP 2020 was approved a new section titled 'Online and Digital Education: Ensuring Equitable Use of Technology' was added in the previous draft of NEP 2019. Importantly this inclusion of the section in the final version on online and digital education was done exactly after five years of the launch of Digital India Campaign in July 2015 with the objectives of connecting rural areas in the country with high speed internet networks, improving digital literacy and developing a sound digital infrastructure across the country. Coincidentally it was a time when not only India rather the whole world was facing a global pandemic named COVID-19. Most of the time the educational institutions and schools remained closed for about two consecutive academic calendars in most part of the country. India was second country in the whole world having closed its school for the longest duration. By and large most of the academic institutions successfully completed their most of the programmes during these pandemic years when the students were forced to confine themselves within their homes. Despite huge gaps in digital access, awareness, infrastructure and technological divides, the way students and teachers made use of ICT and online platforms for teaching training and learning on mass level is enough to explain the digital infrastructure and literacy that was being developed in India though silently but effectively particularly after the Digital India Campaign. It was the visionary decision of Digital India Campaign in 2015 that saved the country's education system from being collapsed during COVID-19 country wide lock down in the year 2020-21. Further the sections added in NEP 2020 in relation to digital equity were remarkable and brought a vibrancy and dynamism in the whole education system despite lockdown and work from home confinement during pandemic years.

In this context this study is a small effort to understand the way in which the students belonging to teacher education colleges and departments across India were impacted by the sudden change in the mode of their learning and teaching into online and ICT from the conventional face to face mode. The present study focuses on knowing how the COVID-19 related lock down for almost two academic years has influenced the access of mobiles and other e-gadgets, the time spend on online teaching learning, the use and awareness of different online teaching leaning apps. The

present study also tried to understand how the pandemic has empowered the students with the knowledge and skills of varied information communication and online technologies. The study also tried understand the students' personal experiences (Problem/Challenge, Opportunity/Potentiality) with ICT and online during pandemic years in their own words if they wanted to share.

Objectives of the study

- To study and compare the availability of ICT related gadgets to the students during pre and post COVID-19 lockdown.
- To study the average daily uses of mobile and other electronic gadgets for educational purposes by the students during pre and post COVID-19 lockdown.
- To study the apps used for educational purposes by the students during pre and post COVID-19 lockdown.
- To study the online skills learnt during lockdown for educational purposes by the students.
- To study the personal experiences shared by the students related online teaching learning and ICT in the field of education during COVID-19 lock down.

Sample for the study

245 responses were received across 20 universities/colleges from 13 states across all parts of the country. The data received was cleaned in order to avoid irrelevant, out of the context, repetitive, incomplete, and blank responses. The sample for the present study finally comprised of 206 prospective teachers doing teacher education programmes in education/teacher education departments and colleges across 20 universities/colleges spread over 13 states of India.

About the tool used in the study

A comprehensive, self-repertoire questionnaire was developed for students which included multiple choice close ended questions as well as truly subjective open ended questions without any choice. The questionnaire included items pertaining to basic information, availability of electronic gadgets both pre and post COVID-19 lockdown, average daily uses of mobile and other electronic gadgets for educational purposes during pre and post lockdown,

apps used for educational purposes during pre and post COVID-19, Online skills learnt during lockdown for educational purposes and personal experiences related online teaching learning and ICT in the field of education during COVID-19 lock down. The students responded through Google form. They were supposed to response in a variety of ways such as basic informations in short answers, few items in checkboxes with the option of listing more than one choice while few multiple choice items with mutually exclusive responses. The items with checkboxes and multiple choices were also supplemented with an option of any other where respondents were given the choice to list their opinion. The last two items were open in nature where the students were free to respond in their own words if they desire so. All items were optional in nature and there was no binding on the students to respond compulsorily. Instructions in relation to relevance, confidentiality and target group of the study were mentioned in the very beginning in order to avoid any kind of confusion in the minds of the respondents.

Analysis and findings

The responses received from the students was downloaded into spread excel sheet. After necessary cleaning additional excel sheets were extracted from the original sheet to do objective wise analysis. Suitable quantitative and qualitative statistical techniques were used to analyze the data collected. Aggregates, frequencies, percentages were computed. Necessary Tables, charts and graphs were drawn to understand the trends and patterns easily. Content analysis of the open ended items pertaining to online skills learnt and personal experiences responded was done. Objective wise brief description of the findings based on the tables, graphs and charts have been done which has been discussed ahead.

Objective 1: To study and compare the availability of ICT related gadgets to the students during pre and post COVID-19 lockdown

A comparison of personal electronic gadgets and mobiles availability to the students has been done between pre lockdown and post lockdown as depicted in Table 1.

Table 1: Availability of ICT related Gadgets during Pre and Post COVID-19 Lockdown

Personal E Gadgets for Educational Purpose	Pre Lockdown	Post Lockdown	Percent Change
Android/Smart Mobile	142	156	9.86
Android/Smart Mobile; Laptop	18	26	44.44
Simple mobile	22	6	-72.72
Simple mobile; Android/Smart Mobile	6	4	-33.33
Simple mobile; Android/Smart Mobile; Laptop	4	3	-25
Others	4	3	-25
Android/Smart Mobile; Desktop	3	2	-33.33
Android/Smart Mobile; Desktop; Laptop	1	2	100
Android/Smart Mobile; Laptop; Tablet	2	2	0
Android/Smart Mobile; Desktop; Laptop; Tablet	1	1	0
Simple mobile; Laptop	3	1	-66.66

As is clear from the Table, the use of smart mobiles was popular and most common even before pre lockdown. As the table shows that a huge majority of students responded that they had a smart mobile (124 out of 206 students) even before the pre lockdown but what is more important is that there is about 10% increase in the use of smart mobiles by the students. Another significant finding that came out from

the responses of the students is that, in pre lockdown, a considerable number of students that is (22) students which is about 10% of the respondents were using only simple mobile and that has reduced to 6 which means overall more than 70% reduction in the use of simple mobiles by the students.

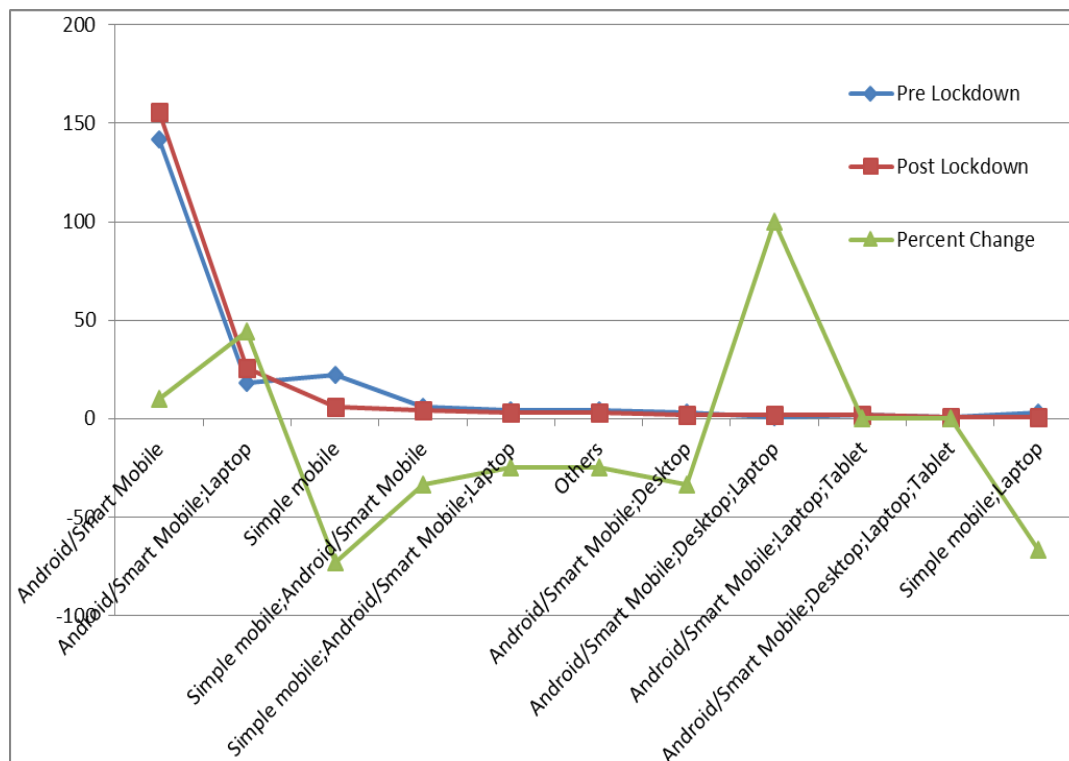


Fig 1: Availability of ICT related Gadgets during Pre and Post COVID-19 Lockdown

Another conclusion that we can draw is that the use of laptops though not very high but considerably increased in post lockdown in comparison to pre lockdown along with smart mobiles. In other cases we can see that one of the respondents has also responded that now he has all mobile, laptop and desktop which earlier he didn't have. The overall conclusion that we can draw from Table 1 and Figure 1 is that there is a clear cut reduction in the use of simple mobiles and students have been forced to buy smart mobiles which is a pre requisite for online teaching and learning. Further the students are attracted towards laptops after the entry of covid-19 and the Lockdown was announced in the country. Reliance of 6 students on simple mobile at a time when their course was running online shows the inequality

still present among our students. One can easily understand the challenges with which they are passing in completion of their programmes.

Objective 2: To study the average daily uses of mobile and other electronic gadgets for educational purposes by the students during pre and post COVID-19 Lockdown

Another important question that was asked with the students is concerned with time they were spending on the electronic gadgets and mobiles before lockdown and post lockdown. This question is very important, taking into account the harmful impacts of frequent and prolonged use of electronic gadgets and mobiles.

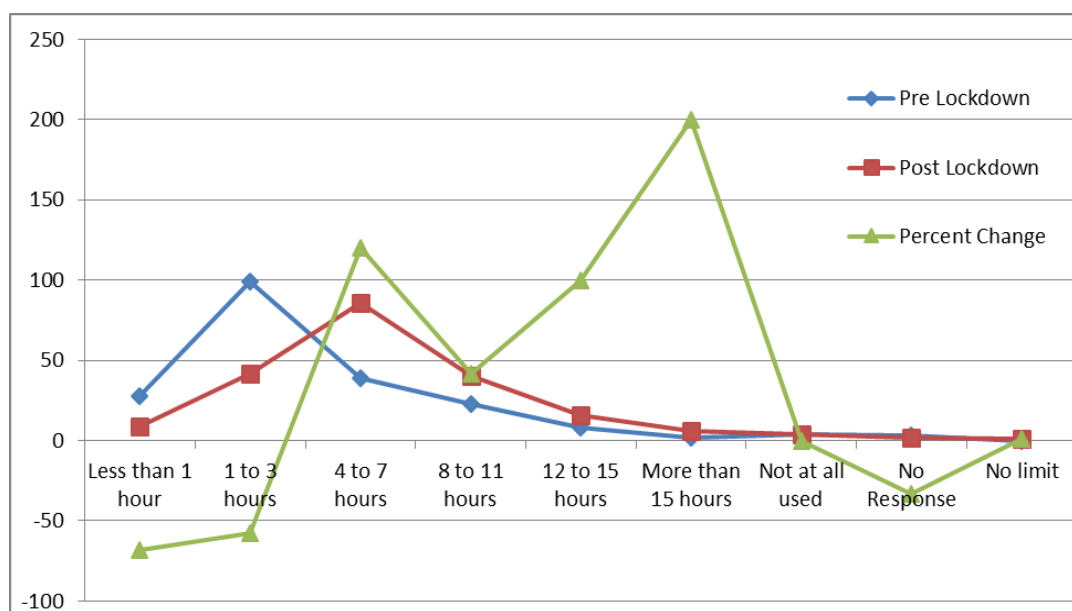


Fig 2: Average daily use of mobile and other e-gadgets for educational purposes

Table 2: Average daily use of mobile and other e-gadgets for educational purposes

Mobile and other E Gadgets Daily Use Time for Educational Purposes	Pre Lockdown	Post Lockdown	Percent Change
Less than 1 hour	28	9	-68
1 to 3 hours	99	42	-58
4 to 7 hours	39	86	120
8 to 11 hours	23	40	42
12 to 15 hours	8	16	100
More than 15 hours	2	6	200
Not at all used	4	4	0
No Response	3	2	-33
No limit	0	1	...

The respondents reported (Refer Table 2 and Figure 2) a steep up-rise in the time spent in post lockdown on electronic gadgets and mobiles. As per the data earlier in pre lockdown a considerable number of students (28) were using electronic gadgets for as less as less than one hour. A huge number of students (99 out of 206) were using for a little more duration that is 1 to 3 hours in pre lockdown period. In brief we can conclude that that more than 50% (127 out of 206) students were using electronic gadgets on daily basis for less than 3 hours which has steadily came down to less than 25% (51 out of 206) during post lockdown period. The table depicts a more than 100% increase in the daily use of electronic gadgets and mobile. Similarly there is a very high increase in the use of electronic gadgets on daily basis for 8 to 11 hours duration. About 10% of the students responded that they are now using electronic gadgets and mobiles in post lockdown period for more than 12 hours. Astonishingly though few in number (6) students accepted that they are using mobiles even more than 15 hours a day on daily basis. In pre lockdown also there were students who used mobiles for 12 hours or more but their number was very small which has gone almost double in post lockdown.

Objective 3: To study the apps used for educational purposes by the students during pre and post COVID-19 lockdown

A question was asked with the students regarding apps used for educational purposes by the students during pre and post COVID-19 lockdown. There is a revolutionary transformation in the use of some mobile apps particularly related to online teaching learning (see Table 3 and Figure 3). The two important online teaching apps Google meet and Zoom which was known by only about 10 to 15% of the respondents before lockdown is now so popular and is used by a huge majority of students and there is approximately 360% increase in the use of this two apps combine together. Another significant change is that the use of You-tube at Google has not shown any significant change in pre lockdown and post lockdown period. The use of other online teaching learning apps particularly Google Classroom, Cisco Webex has increased considerably. There are certain apps particularly teaching learning apps which were not at all known by the learners and they were never used by the students which have been used considerably by a small number of respondents out of the total sample that has been studied.

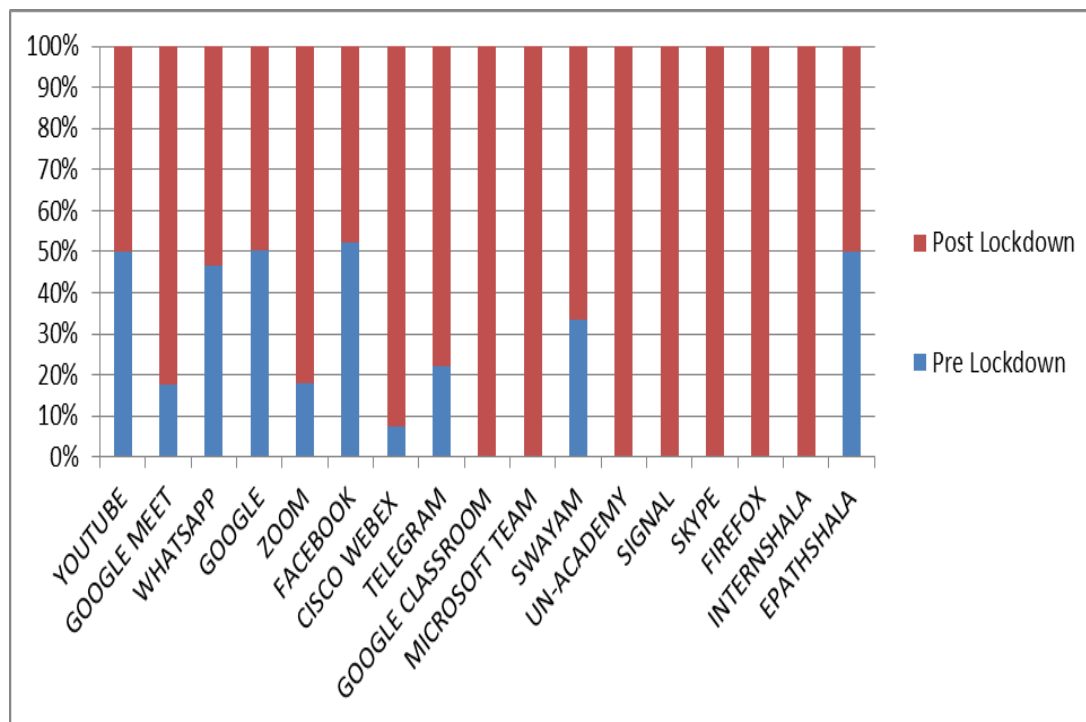
**Fig 3:** Apps used for educational purposes Pre and Post COVID-19 Lockdown

Table 3: Apps used for educational purposes Pre and Post COVID-19 Lockdown

Apps Used for Educational Purposes	Pre Lockdown	Post Lockdown	Percent Change
Youtube	160	160	00
Google Meet	33	155	403
Whatsapp	130	149	15
Google	148	146	-1
Zoom	26	118	354
Facebook	48	44	-8
Cisco Webex	2	25	1150
Telegram	2	7	250
Google Classroom	0	6	6
Microsoft Team	0	3	3
Swayam	1	2	100
Un-Academy	0	2	2
Signal	0	2	2
Skype	0	1	1
Firefox	0	1	1
Internshala	0	1	1
Epathshala	1	1	00

Objective 4: To study the online skills learnt during lockdown for educational purposes by the students**Table 4:** Online skills learnt during lockdown for educational purpose

S/No	Response	Frequency	S/No	Response	Frequency
1	Teaching/Learning/Showing PPT	13	25	Online examination	2
2	Search/download study/ed. materials	9	26	Making/Creating Pdf	2
3	Online/All Teaching Skills	7	27	Teaching observation/supervision	2
4	Using live/audio/video TLM/charts/pictures	7	28	Classroom Management Skill	2
5	Yes/A lot/All teaching skills	7	29	Effective/Use of Youtube	2
6	Teaching/working on Google meet	6	30	Presentation Skill	2
7	Demonstration Skill	5	31	Audio video teaching skill	1
8	Use of White Board/head	5	32	Black board skill	1
9	Listening /Speaking/Communication Skills	5	33	Debate	1
10	Using/teaching on Zoom	5	34	Inductive method	1
11	Effective use of ICT	4	35	Courage to face camera	1
12	Friendly/cooperative Attitude/politeness	4	36	Effective use of Chat box	1
13	Google classroom/Byjus/Classmate	4	37	Use of Digital tools	1
14	Virtual Learning/Teaching/classroom	3	38	Assessment and Evaluation Skills	1
15	Interactive teaching	3	39	Subjects expertise	1
16	Lecture method/Skill	3	40	Online Internship Programme	1
17	Screen sharing/presentations	3	41	Core and expanded curriculum	1
18	Effective use of Tripod/Earphones/Laptop	3	42	Expressing/Using limited words	1
19	Clear Words/Voice quality/No harsh sound	3	43	Talking in front of cameras	1
20	Dev. of Creativity/self-motivation/patience	3	44	Teaching from home	1
21	Time Management	3	45	Teaching without seeing students	1
22	Effective/Use of What's app	3	46	Psychological perspectives of ed.	1
23	Digital teaching/tool	2	47	Kine master	1
24	Discussion method	2	48	Able to use different meeting apps	1

Though open ended but with an objective connotation a question was asked to just mention the important online skills that the trainees learnt during lockdown from March 2020 for educational purposes. It is happy to note that more than 50% of the respondents responded to this question. The analysis of this open ended question and the content analysis revealed that the students have responded in diverse manners. While some students responded to this question very objectively and mentioned specific skill, behavior or learning, some students were subjective in their response that they learnt all kinds of skills and reported accordingly. Some responses were very vague in nature. It was not clear that what exactly they want to say. Content analysis was done of the responses and the responses that were common in nature were clubbed together. However all efforts have been done while analyzing this question that their natural

responses should be kept here as it is in Table 4 as far as possible in their own words for the sake of readers understanding the context.

Objective 5: To study the personal experiences shared by the students related online teaching learning and ICT in the field of education during COVID-19 lock down

As a last item in the questionnaire a completely open ended question was asked to mention freely any personal experience, problem, challenge, opportunity, potentiality, that students find related to use of ICT in the field of education and training in the present scenario. A total of 127 students responded to this question by putting their experiences in their own words. An in-depth content analysis was done and responses of similar nature were clubbed together in order to draw meanings.

Table 5: Personal experiences related to online teaching learning and ICT

S/No	Responses	Frequency
1	Not Good/ Total Waste /Poor Learning Outcomes/Problem in Quality Evaluation/Home Cannot be Classroom/ICT is Big Challenge/Limited Experience/Teachers Can't Rectify/Skilled Teachers Required/No Serious Study/Problem of Distraction/Learning Difficulties/Experience Needed to Use ICT/Difficulty in Using New Apps and their Features/ICT is Monotonous/Boring/Lack of Peer Interaction/Lack of Co-curricular Activities/No Human Contacts/May Create Fear of Crowd/Lack of Library Resources/ Cheating and Copying Possible/ Difficult to Build Study Environment	41
2	Network Issue/Problem/Connectivity Issue/Bad Network/Taking time in Uploading Exam Papers/Poor Quality of Video Audio	24
3	Physical/Health/Mental/Psychological Problems/Problems in Eyes/Ears/Headache	20
4	Good Experience/ICT is best for every Student/Continuous Education/Gives Freedom/No physical Harassment/Any time Any Where/Suitable for Physically Challenged/Suitable During crisis/Can save data easily	19
5	Huge Potential to Impart Education/Suitable for Rural Areas/Handle More Students at a Time/Access more information in little times/Search information quickly	16
6	Any other/No Comments/No/Nothing/Yes	13
7	Learned many ICT Skills/Opportunity to show my ICT Skills	11
8	Not Suitable for Students Belonging to Middle and Lower Class/Monetary Problem/Internet Data Costly/Lack of Technical Resources/	9
9	Lack of Electricity/Electric Problems/Charging Problems	6
10	Rural Area Problem/Lack of Space/Place at Home/Offline Study is Better than Online	5
11	No Problem	4
12	It is Good but not the Best	1

There was huge variation in both the quality and quantity of the responses being given by the students. While some students responded in a single word, some in a single sentence while few elaborated their experiences in paragraphs ranging from 2 to 5 sentences. Qualitatively while a significant number of students highlighted the positive aspects of ICT and online teaching learning, a vast number of responses drew attention towards the challenges and problems encountered while online teaching training and learning during COVID-19 lockdown. Some students responded both the positive and negative experiences with ICT during online classes. Surprisingly few responded shared some unique experiences that needed worth mention. An effort has been made in Table 5 to club similar responses together while also retain students' natural responses in their own words as much as possible.

As is clear from the table a significant number of students (41) evaluated ICT and online learning during lockdown as not good and suitable. While citing the reasons few mentioned problems such as poor leaning outcomes, Difficult to Build Study Environment, Poor Learning Outcomes, Problem in Quality Evaluation, Home Cannot be Classroom, Teachers Can't Rectify, Skilled Teachers Required, No Serious Study, Problem of Distraction, Experience Needed to Use ICT, Difficulty in Using New Apps and their Features, ICT is Monotonous and Boring, Lack of Peer Interaction, Lack of Co-curricular Activities, No Human Contacts, May Create Fear of Crowd, Lack of Library Resources and Possibilities of Cheating and Copying increases. Network and connectivity issue came out to be a very important problem that a considerable number (24) of students shared. Another important problem being raised by students (20) was concerned with health and well-being. Students experienced problems ranging from physical to mental to even psychological. Problems in eyes ears and headache were most recorded by the students while sitting on their small mobile screens for quite longer durations. Electricity related problems which is very basic for charging electronic devices for online learning was also shared by few students (6). Another important issue raised by the students was related with the rural urban, rich and poor divide the students expressed in different ways. Issues

such as lack of proper space in their homes to do online classes, costly data packs and money problems were raised by few students.

The number of students claiming ICT and online learning suitable and good during pandemic years is also is also significant (35). Reasons such as Continuous Education, Gives Freedom, No physical Harassment, Any time Any Where, Suitable for Physically Challenged, Suitable During crisis and Can save data easily were given by some of the students. Students also claim that ICT has Huge Potential to Impart Education, Suitable for Rural Areas, Access more information in little times, Search information quickly and one can Handle More Students at a Time. A few students (11) accepted that they learned many ICT Skills as well as the pandemic lockdown gave Opportunity to show their ICT Skills. Few students said that they have no problem with online and ICT enabled teaching learning. One student responded in a very balance manner that online teaching and learning is good but not the best.

Conclusion

COVID-19 pandemic and prolonged lockdown and work from home has compelled the educationists and policy makers to revisit the mode of education transaction and delivery. A complete transformation was seen once complete closure of all academic institutions ranging from schools to university was announced in March 2020. No doubt Government of India flagship digital India campaign since 2015 played a very significant role in empowering students, teachers, academic institutions and the country with an improved digital infrastructure, awareness and ICT skills. But still there was a kind of inertia towards ICT among most of the stakeholders of education till the global pandemic forced all to confine to their homes. It was during COVID-19 lockdown that for the first time on such a large scale the hidden potentialities of ICT was realized in the field of education and training. At the same time during these pandemic years, challenges posed by the digital divide, low digital literacy and poor digital infrastructure was experienced by a huge population. No doubt the students in the present study by and large accepted the fact that they have learnt a number of ICT and online teaching

learning skills. Their awareness towards different apps their features have increased. Their capabilities and literacy towards ICT has tremendously enhanced but at the same time challenges such as network/connectivity issues, electricity problem and problems of affordability. Health and hygiene related issues is worth mentioning here as reported by the students particularly because of unsuitability of small mobile screen used by a vast majority of students for online teaching training and learning for long durations on daily basis since they can't afford a laptop or desktop. In the new normal ICT and online educational activities is a reality. What is required is to execute the provisions made in the NEP 2020 in relation to Digital and online Education in order to ensure equitable use of technology in true sense and spirit. It is high time to work on war level to strengthen digital infrastructure, reduce digital divide, and create a rich digital repository. All efforts should be taken to provide training to teachers towards latest techniques and tools of ICT and provide minimum logistics to each and every institute across the country.

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