

Impact of Covid-19 on Higher Education in Tamilnadu, India

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Abstract:

Education is a prime part of everyone's life and Covid-19 pandemic complexity has transformed everything in an unexpected way that culminated in everyone having to suffer due to this unpredicted, complicated period of lockdown. In this pandemic situation, education has also become a question mark for every child for the past two years. Initially, online teaching and learning was not comfortable to teachers and students owing to a myriad of reasons such as tower, network, desktop, laptop, mobile phone, low bandwidth, power supply, Wi-Fi and many more problems. This paper discusses impact of Covid-19 and its ramifications on higher education in Tamil Nadu, India. In this pandemic situation, ICT has played a vital role in connecting everyone in a digital environment and used different varieties of communication technologies in a single forum called virtual classroom. Furthermore, extensive analyses were completed by various aspects of online education and experimental results were implemented through SPSS tool to generate better evidence for future researchers and the results have been displayed in real time environment. Finally, the perspectives of online education among students in Tamil Nadu are concluded with pros and cons of online learning and their suggestions have been included well to improve efficient ICT teaching and learning process for future generation.

Keywords:

Covid – 19, Higher Education; Lockdown, Online Education, Virtual Classroom, Tamil Nadu, ICT Tools

1. Introduction

Coronavirus disease (COVID-19) is a disease that affects human health and its infection is mainly transmitted through droplets generated when an infected person coughs, sneezes, or

exhales. To avoid contact with these droplets, it is important to stay at least one meter away

from others, clean hands frequently, cover the mouth with a tissue or bend elbow when sneezing or coughing. When physical distancing (standing one meter or more away) is not possible, wearing a face mask is an important measure to protect others. On 31st December 2019, Wuhan Municipal Health Commission, China, reported a cluster of cases of pneumonia in Wuhan, Hubei Province. A novel coronavirus was eventually identified. On 1st January 2020, WHO (World Health Organization) set up the IMST (Incident Management Support Team) across three levels of organization: headquarters, regional headquarters and country level, putting the organization on an emergency footing to deal with the outbreak. On 4th January 2020, WHO reported on social media that there was a cluster of pneumonia cases – with no deaths in Wuhan, Hubei province. On 5th January 2020, WHO published first Disease Outbreak News about the new virus. The first cases of Covid-19 in India were reported in the towns of Thrissur, Alappuzha and Kasargod, (all in the state of Kerala) among three Indian medical students who had returned from Wuhan. Lockdowns were announced in Kerala on 23rd March 2020, and in the rest of the country on 25th March 2020. By mid-May 2020, five cities accounted for around half of all reported cases in the country: Mumbai, Delhi, Ahmedabad, Chennai and Thane. The first case of the Covid-19 pandemic in the Indian state of Tamil Nadu was reported on 7th March 2020 in a resident from Kanchipuram in Chennai. The state had been under a lockdown since 25th March 2020 which was relaxed to an extent from 4th May 2020 onwards. The lockdown was further extended until 30th, June 2020 with significant relaxations from 1st June ,2020. The state enforced a strict lockdown in four majorly-affected districts which included Chennai and its three neighbouring districts of Chengalpattu, Thiruvallur and Kancheepuram from 19th to 30th June 2020. Moreover, repeated lockdowns and few relaxations were examined from 1st July, 2020 to the end of December 2021. However, a new virus is spreading all over world named Omicron.

1.1 Online Education

During this pandemic situation, Online teaching became a prerequisite part of the teaching professionals who went ahead with their job without their routine activities being uninterrupted. Initially, everyone who was not familiar with online education in Tamil Nadu struggled such as teachers and students. Conversely, there was a mammoth chunk of technical institutional professors who were teaching online certified courses through non-profitable digital forums like Swayam, NPTEL, MOOC, EdX, etc. As a matter of fact, these platforms guided the teachers and students to adopt to online teaching and learning process in an easier way.

Approximately, two months later, that is, in June 2020, online education slowly picked up speed and became the backbone of everyone who continued their education in Tamil Nadu unabatedly. After acknowledging the magnitude of virtual education and its benefits, all academic institutions began to transit to conduct online classes through Zoom, Google meet and specialized applications were also created by the organizations. Before starting the regular academic classes, all institutions successfully planned and conducted virtual quizzes, seminars and conferences to create more motivation in online education among students. It trained the students in an easier way to interact with teachers and adopt to online education along with appreciation certificates through online programs.

2. Literature Review

Pravat Kumar Jena discussed the impact of Covid-19 on higher education in India. The author enlightened various online teaching approaches and discussed post pandemic trends of higher education in India. He also pointed out some important suggestions as to how to improve higher education in India. The paper concluded that online education was considered a parallel education system which would be combined with traditional system in future. Additionally, Amit kumar arora and R Srinivasan attempted to study the impact of lockdown on the teaching-learning process in higher education. They focused on the adoption of online classes, its benefits, challenges and issues in detail. Besides, the paper was divided into two major categories such as online education adoption and non-adoption among teachers.

Nanigopal Kapasia et al. concentrated on the impact of lockdown on the learning status of undergraduates and postgraduate students during Covid-19 pandemic in West Bengal, India. They focused on students' perspectives of e-learning and concluded that 70% of learners were involved in virtual education during this pandemic situation. Dr Ankuran Dutta investigated the Impact of Digital social media on Indian Higher Education: Alternative Approaches of Online Learning during Covid-19 Pandemic Crisis. His paper deals with how social media used to disseminate learning resources to the students, and the impact it made on their educational loss. Besides, the author discussed the effectiveness of online classes, e-learning pedagogy, and its outcome through structured qualitative analysis.

Aleksander et al. investigated the impact of covid-19 on higher education from students' perspective. This paper clearly demonstrates socio-demographic factors, and physical and mental health related to online learning. Heather Nadia Phillips explored the learning

trajectories experienced by cohorts of B.Ed Honours students who completed their degree during the Covid-19 pandemic. The author discussed synchronous and asynchronous learning of post graduate students and its impact on socio-economic inequalities. Tilahun Adamu Mengistie discussed students' learning in Ethiopia. A few major points were covered by the author such as how the Ethiopian higher education institutions had responded to the Covid-19 pandemic situation by continuing students' learning remotely and what were the challenges the educational institutions faced in taking mitigating measures to the Covid-19 pandemic and also how the Covid-19 pandemic had changed the educational decisions made by policymakers in Ethiopia.

3. Research Methodology

3.1 Aim and Objectives

The purpose of this work is to explain the pros and cons of online education during Covid-19 pandemic situation. The objective of this work is to deal with different perspectives of online education in real time environment.

3.2 Research Questions

The list of questionnaires is considered for analyzing the work in an effective way. Section A comprises personal information which was gathered from students and Section B discusses structural questionnaires which were circulated among students through Google form.

Section-A: Gender, Course, Education, Studying in, Districts

Section-B:

1. Did you feel comfortable with online education during covid-19 period?
2. Did online classes really support your learning capabilities?
3. Which platform did you avail yourself of to attend the online classes?
4. How many hours of online classes did you attend per day?
5. Which device did you use to attend the online classes?
6. How much amount of financial resources did you spend for your online classes per month?
7. Did you regularly interact with your teachers during online classes?
8. Did you regularly attend the online classes?
9. Were you able to understand online practical sessions?
10. Were you comfortable with online examinations?

11. Do you think online classes are better than traditional classes (Classroom teaching)?
12. What type of difficulties did you encounter during online classes?
13. What type of benefits did you acquire through online classes?

3.3 3 Data and Methods

3.3.1 Subjects

This research work focused on online survey-based on a study of 856 students from different districts of Tamil Nadu. It covered both under graduate and post graduate students of arts, science and diploma courses.

3.3.2 Data Collection and Preprocessing

An online survey was held and information was collected from all over Tamilnadu. For this work, Google form link was created and structural questionnaires were posted. Meanwhile, Google form link was circulated through WhatsApp groups, Emails and Social Media platforms. In this short span of time, huge responses were received from participants who openly expressed their interest in filling the form. In total, 912 responses were received from various universities and 856 records were filtered through data preprocessing techniques. Data preprocessing was applied to eliminate invalid records from the list and finally 856 records were considered chosen for this research work.

3.3.3 Data Analysis

Analysis of this work was done by Statistical Package for Social Science (SPSS) tool. Percentage distribution was carried out to analyze the learning status of the students and their different opinions about online education.

Table 1: Characteristics of the study of participants (n-856)

Characteristics	Frequency(n)	Percentage(%)
Gender		
Male	64	7.5
Female	792	92.5
Course		
Arts	678	79.2
Science	172	20.1
Diploma	6	0.7
Education		
Under Graduate	825	96.4
Post Graduate	24	2.8
Research Scholar	7	0.8

Studying in		
Government College	14	1.6
Government-Aided College	171	20
Private College	671	78.4
Districts in Tamil Nadu		
Chennai	354	41.36
Kanyakumari	12	1.4
Chengalpet	8	0.93
Kancheepuram	10	1.17
Madurai	2	0.23
Thiruvallur	266	31.07
Coimbatore	65	7.59
Salem	87	10.16
Viluppuram	6	0.7
Ranipet	9	1.05
Karur	4	0.47
Pudukkottai	1	0.12
Tiruppur	5	0.58
Trichy	6	0.7
Namakkal	2	0.23
Thiruvannamalai	3	0.35
Erode	1	0.12
Dharmapuri	2	0.23
Thanjavur	4	0.47
Nagappattinam	3	0.35
Kallakurichi	2	0.23
Virudhunagar	2	0.23
Vellore	2	0.23

Table 2: Impact of Covid-19 on Higher Education in Tamil Nadu, India

Questions	Frequency (n)	Percentage (%)
1. Did you feel comfortable with online education during Covid-19 period?		
Yes	479	56
No	186	21.7
Partially Fulfilled	191	22.3
2. Did online classes really support your learning capabilities?		
Yes	383	44.7
No	219	25.6
Somewhat	254	29.7
3. Through which platform did you attend online classes?		
Google Meet	836	97.7
Zoom App	9	1.1
Special software created by your university/college	6	0.7
WhatsApp	5	0.6
4. How many hours of online classes did you attend per day?		
2 hours	457	53.4
3 hours	147	17.2

4 hours	100	11.7
More than 4 hours	152	17.8
5. Which device did you use for attending online classes?		
Personal Computer	5	0.6
Laptop	63	7.4
Mobile Phone	786	91.8
Browsing Centre	2	0.2
6. How much amount of money did you spend for your online classes per month?		
Rs. 100 to 200	102	11.9
Rs. 200 to 300	332	38.8
Above Rs. 300	422	49.3
7. Did you regularly interact with your teachers during online classes?		
Yes	507	59.2
No	76	8.9
Sometimes	273	31.9
8. Did you regularly attend online classes?		
Yes	682	79.8
No	14	1.6
Missed Somedays	159	18.6
9. Were you able to understand online practical sessions?		
Yes	288	33.6
No	91	10.6
Somewhat	163	19
No Practical	314	36.7
10. Were you comfortable with online examinations?		
Yes	710	83.4
No	141	16.6
11. Do you think online classes are better than traditional classes (Classroom teaching)?		
Yes	180	21.1
No	409	47.9
Both are Equal	264	30.9
12. What type of difficulties did you encounter during online classes? (Multiple Options)		
Tower / Network Problem	712	83.2
Computer / Laptop / Mobile Phone Technical Problem	149	17.4
Low Bandwidth	47	5.5
Mental Stress	195	22.8
Health Problem	165	19.3
Power Supply Problem	140	16.4
13. What type of benefits did you acquire through online classes? (Multiple Options)		
Learned New Technologies	375	43.8
More Interactive with Teachers	88	10.3
Better Understanding and More Technical Inputs	92	10.7
Easy to Connect with Everyone	168	19.6
Learned more Practical Knowledge	65	7.6
All the above	273	31.9

4. Result and Discussion

The research work broadly discusses virtual higher education during Covid-19 period in Tamil Nadu. For experimental analyses, the following personal information has been collected from the students such as gender, course, education level, college category and district. Furthermore, in depth analyses were done about questionnaire section and the experimental result showed better evidence about online education in Tamil Nadu.

4.1 Comfortability of online education

Figure 4.1.1 shows comfortability of online education among the students' community in Covid-19 period. In this figure, while 56% of students are comfortable with online education, 21.7% of students are not comfortable. 22.3% of students are partially happy with their online education system. Even though majority of students are comfortable, still many students cannot fulfil their needs due to many reasons. The reasons can be poor network, low bandwidth, economic struggle, lack of digital devices, power supply, health issues and many more crises. In order to focus on these problems and fix them, students have to come out of these issues which will help them enhance their learning process.

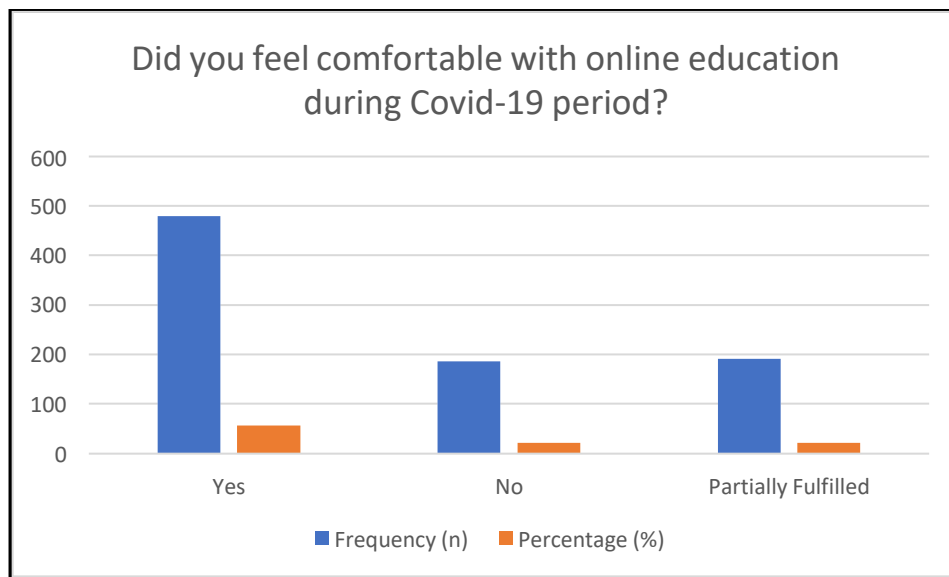


Figure 4.1.1: Comfortability of online education

4.2 Online education support

Is the Online education really supporting the student's learning ability or not? For this question, everyone says "of course, yes", but in reality, it is not true in Tamil Nadu. Figure 4.2.1 displays online education support and how it helps the students learning process. In this

figure, 44.7% of students have stated that online education has supported and improved their learning ability. However, the remaining 25.6% of students have said that they are not comfortable and cannot improve their studies through the online mode. Also, 29.7% of students are of the opinion that online mode is somewhat OK, which means they were not able to learn 100 percent. Other sources like the colleges and parents probably helped these students attend the classes and write their examinations. Online education is not simply conveying the message or completing the syllabus. It must be comfortable to students and help them create an interest on the subject. To improve the learning ability of the students, good initiatives should be taken from the government, teachers and parents. For this, first find out the problems faced by the students whether or not the students discontinued the online classes with any break, insufficient data, mobile / laptop battery drainage, eye irritation, body pain, lack of interest on subject, etc. and the successful findings can support and resolve the problems quickly and improve the online learning ability.

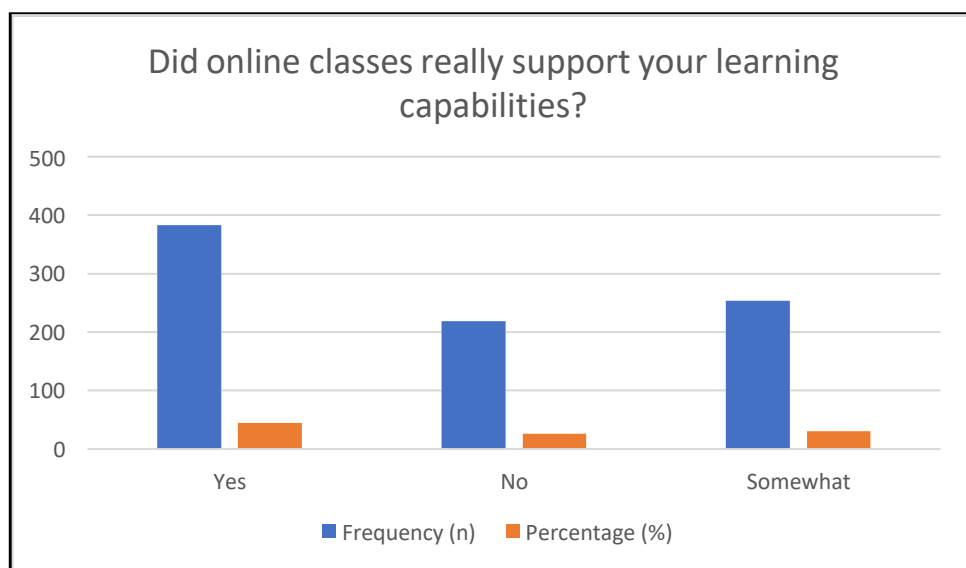


Figure 4.2.1: Online education support

4.3 Online class platform

Most of the online classes were conducted through Google meet. Figure 4.3.1 illustrates online class platforms. 97.7% of students were using google meet application to attend their classes. Some institutions were still using zoom app for the classes. The usage of zoom app is 1.1% because of limited time and restricted number of participants. 0.7% of students were using special software created by universities or colleges. The reason behind the less usage of specialized software was owing to lack of time to create new applications. Everyone was thinking about how to survive in the pandemic situation and so they concentrated on existing

applications which supported online education. WhatsApp usage for online class was 0.6% because students from rural could not attend live classes due to poor network connections. Additionally, teachers kept sending their assignments, classwork notes and materials through WhatsApp to fulfill the needs of the students. In this case, Google meet has played a vital role in conducting online classes in an efficient way. Initially, Google meet allowed unlimited participants to attend the classes. However, it restricted the participants to 100 for each session. After restricting the participants, some institutions resorted to conducting online classes. Thereafter, institutions purchased storage space and increased the number of participants depending on the need of the class strength. Subsequently, Google organization understood the need of the requirements and offered many services for online classes. It also supported multiple admission options and recording facilities to support virtual education.

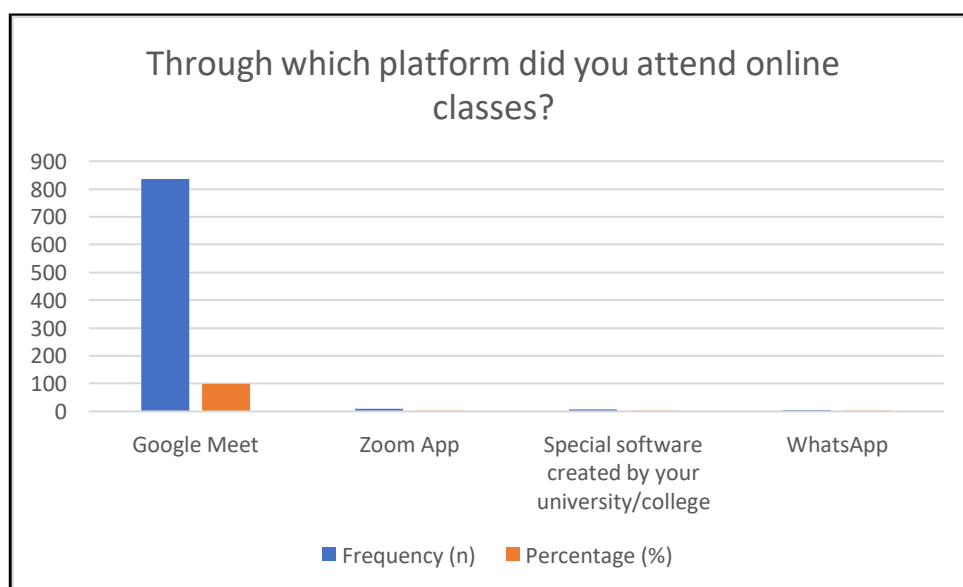


Figure 4.3.1: Online class platform

4.4 Duration of online class

Next, one of the most important aspects of online classes is the duration of time the online classes have spent. This is quite interesting because most of the institutions have allotted two hours on online classes. Figure 4.4.1 shows duration of online classes per day. 53.4% of students have attended online classes 2 hours per day. Initially, the government announced 2 hours per day which was very efficient and the students felt very comfortable to attend the online classes. Many institutions abided by the norms and held classes within the stipulated time. However, some institutions conducted online classes for more than 2 hours. While 17.2% of students attended 3 hours per day, 11.7% of students attended 4 hours per day. Besides, 17.8% of students attended the online classes more than 4 hours per day. According the

students' point of view, this was unfair and they felt demotivated. Since the Institutions were focusing on completing the syllabus such as practical sessions and many curricular activities, 2 hours per day was not sufficient for them. On the other hand, more than 4 hours per day was not comfortable from students' perspective owing to their facing many health complications because of non-stop online classes such as eye irritation, increasing body temperature, neck pain, tiredness etc. While students did not suffer much with 2 hours per day, 4 hours per day was too much for them and it also consumed more data and as a result students were not able to attend the classes.

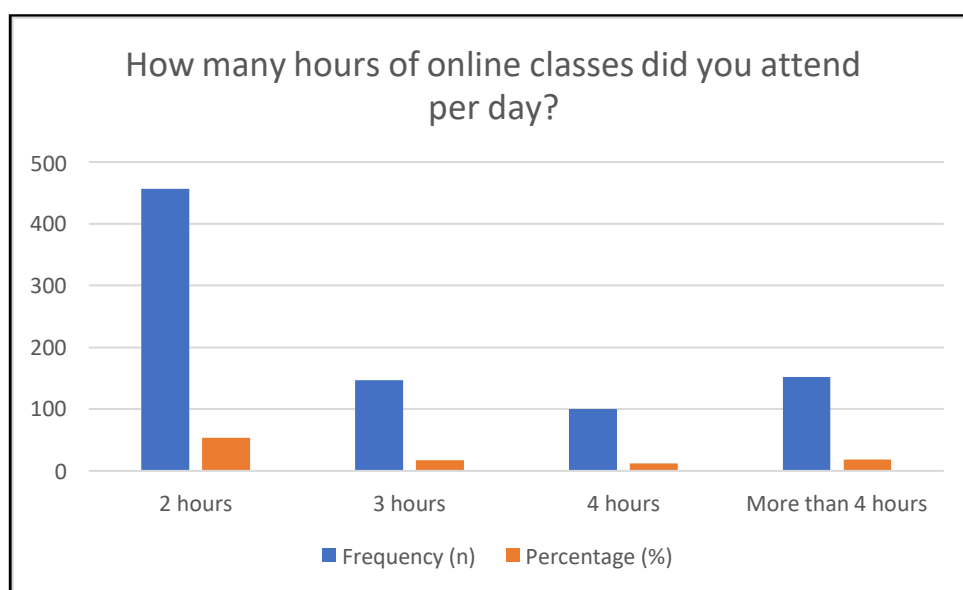


Figure 4.4.1: Duration of online class

4.5 Electronic device

The students are attending online classes via personal computer, laptop and mobile phone. Figure 4.5.1 demonstrates a device being used by students attending online classes. In this figure, 91.8% of students are using mobile phones for their online classes. It shows a massive usage of mobile phones among younger generation that is easy to use. Mobile phones have played an important role during this pandemic situation. It consumed less energy. It is easy to use, portable and it is low priced compared to computers or laptops. Even though mobile phone usage is more, small screen is a major disadvantage. Because of visualizing content, images and size of texts are very small in mobile phones, students found them to be very straining and it barred them from attending the classes without any interruption. While 7.4% of students were using laptops, 0.6% of students were using personal computers for their online classes. 0.2% of students were using browsing centres. Still, many students did not have any

electronic gadgets to attend online classes and they were using browsing centres for submitting important assignments, internal tests and online exams. Many students from rural areas dropped their studies due to COVID-19 because they did not have any devices to attend the classes and even struggled for their daily bread. Most of the parents were losing their jobs and their economic conditions began to tumble down due to joblessness. In this situation, students were starting to discontinue their studies and going for daily wages.

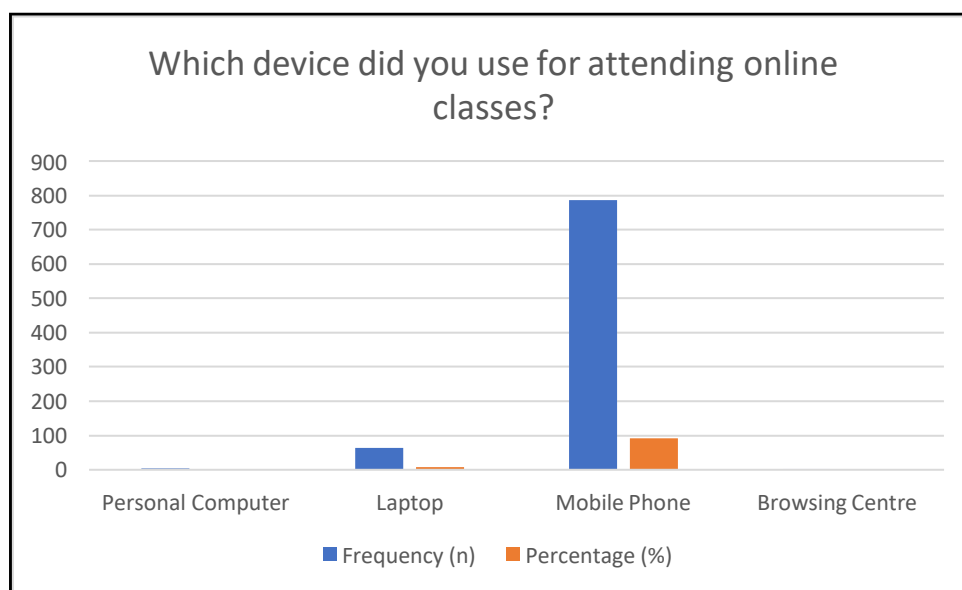


Figure 4.5.1: Electronic device

4.6 Recharge amount

Next most important category of this work is the recharging amount that was spent for a month. Figure 4.6.1 shows the amount spent by the students for recharging their mobile phones for online classes per month. In this category, 49.3% of students have spent above Rs. 300 for the recharge, 38.8% have put in Rs. 200 to Rs. 300 while 11.9% of students have expended Rs. 100 to Rs. 200. This report shows that most of the students have used up more amount in the online classes for the uninterrupted speed of data. Still, many students were not able to spend that much amount for the recharge and it resulted in skipping their classes. To overcome this problem, Tamil Nadu Government initiated the 2GB free data for SC/ST students. This scheme improved and regularized the online classes and helped many students attend the classes without any financial constraints.

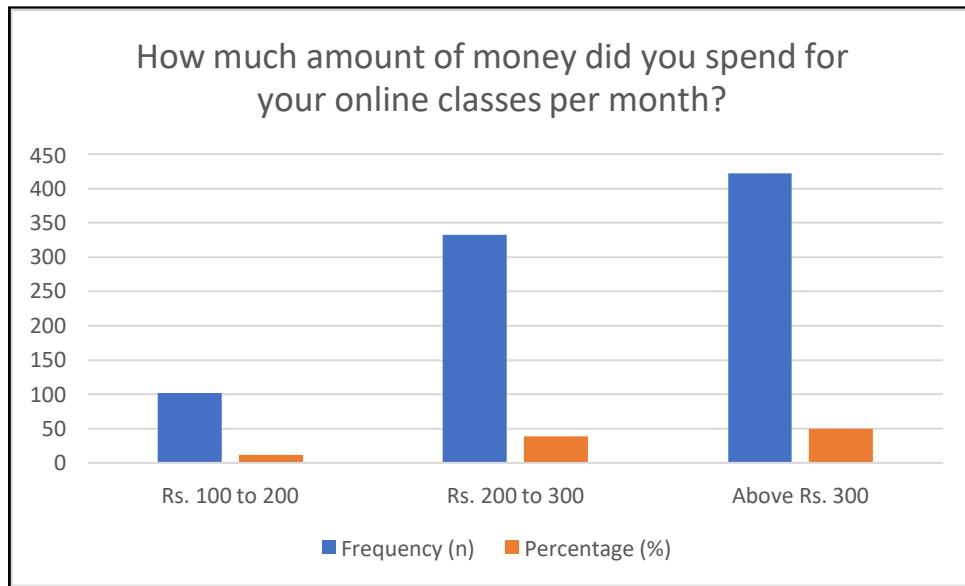


Figure 4.6.1: Recharge amount

4.7 Online class interaction

Whether Online classes or traditional class, a student’s interaction with the teaching staff is very much important for the benefit of the students. It will develop the learning ability and create an interest in the subject. Figure 4.7.1 presents online class interaction. In this figure, 59.2% of students regularly interacted with their teachers and 8.9% of students were not interested in talking with teachers. They were not involved in any communicational activity but simply attended the classes. 31.9% of students partially interacted with teachers and asked questions.

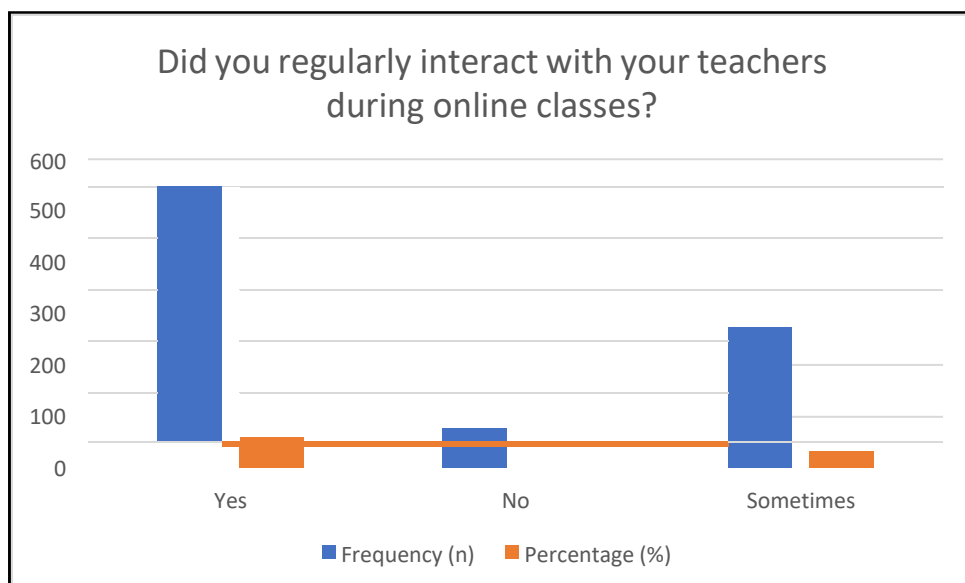


Figure 4.7.1: Online class interaction

4.8 Online class attendance

Online class attendance played a major role and showed the learning interest of the students. Figure 4.8.1 shows online class attendance. 79.8% of students regularly attended their online classes. This report shows that majority of the students were interested in learning and maintained a full attendance during the semester. Even though many students faced many problems due to COVID-19, an increasing percentage of attendance exhibited students' knowledge and this backed up their final examination. Regular students were able to get good grades and learn many things during the online classes. In contrast, 18.6% of students missed the attendance due to some valid reasons. These reasons could be owing to poor health issues, cell phones being not recharged, mobile phones, and other network issues etc. Moreover, 1.6% of students did not attend their online classes due to lack of mobile phones /laptops/desktops, being economically weak, belonging to rural areas etc.

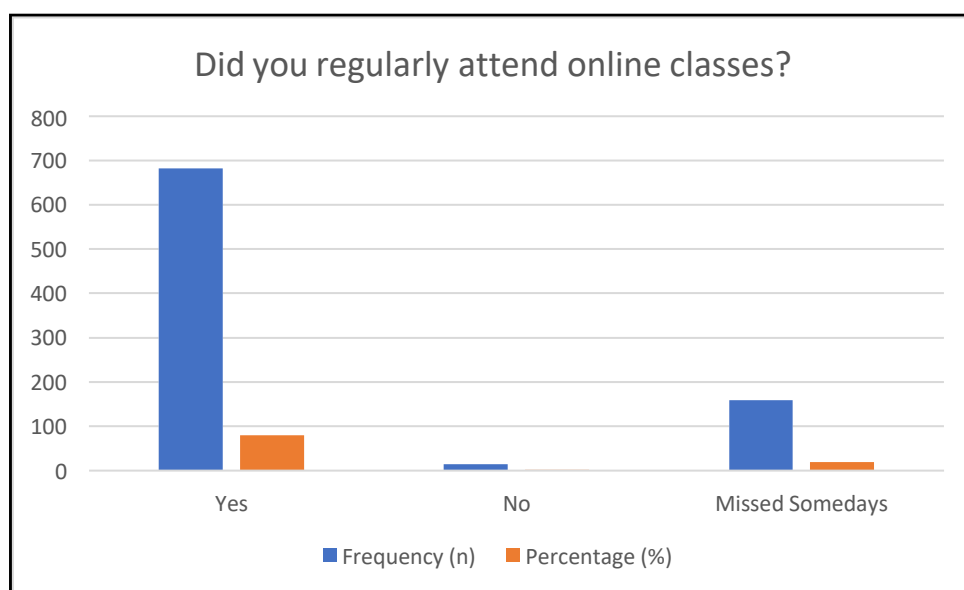


Figure 4.8.1: Online class attendance

4.9 Online practical

Figure 4.9.1 illustrates understanding level of online practical. Majority of the students i.e. 36.7 did not have any practical subjects. Maybe, these students belonged to arts background and so they were not worried about online practicals. 33.6% of students understood the online practicals since these students had a solid science background. Today, there are a lot of online stimulation tools which support online practical sessions and help students to improve understand the level in a better way. Additionally, many students are more interested in learning online practical sessions than traditional methods and create their own programs in an

interesting way. 19% of students are still having some doubts but they are attending the classes regularly. 10.6% of students do not understand online practical sessions because online practical is new to students and they are so confused that they cannot execute the programs. Sometimes, free online practical tools do not support and they are not user friendly in mobile phones. Moreover, students who had their mobile phones hanging up, found it troublesome to load and execute the programs. Security concern is also challenging for the online practical sessions.

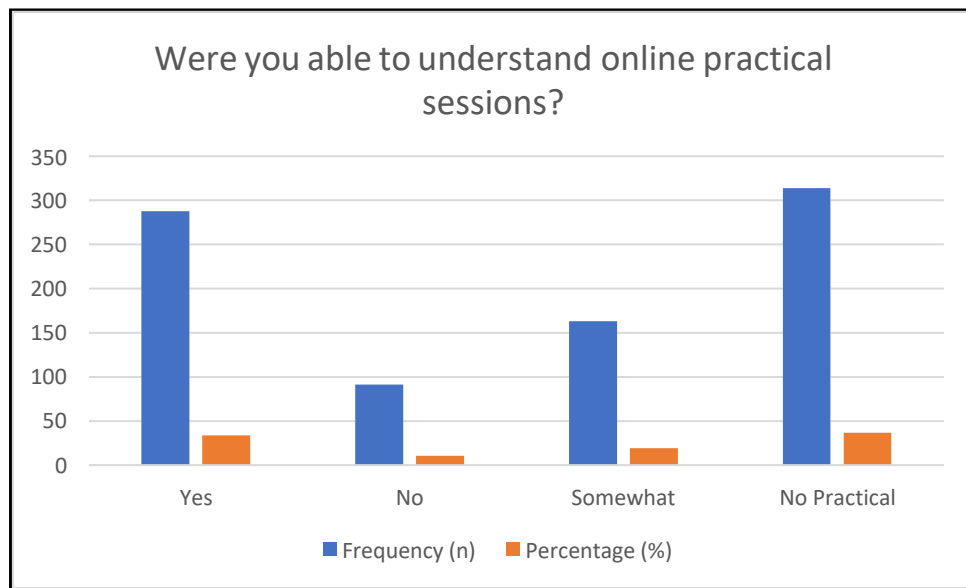


Figure 4.9.1: Online practical

4.10 Online exam

Figure 4.10.1 discusses comfortability of online exam. This COVID-19 has transformed everything in an alternative way. Online examination is also not an exceptional case. 83.4% of students are comfortable with online examinations and 16.6% of students are uncomfortable. In fact, online examination improves students' confident level and continues to get them prepared for their upcoming semesters in an uninterpreted way. The way the online examination is handled is different from each university and it targets the comfortability of the students. One of the drawbacks of online examination is technical problem due to device discomforts, time constraints, network problem, etc.

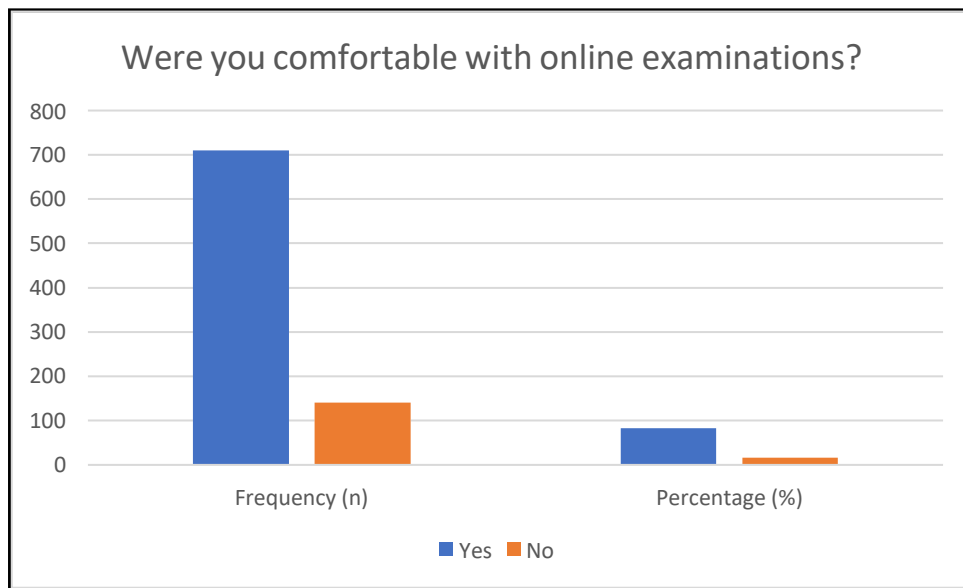
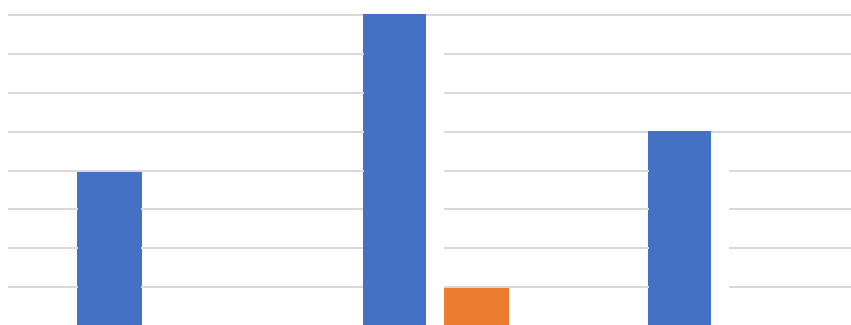


Figure 4.10.1: Online exam

4.11 Online Vs. Traditional Teaching

Figure 4.12.1 displays online education vs traditional education. This is quite interesting because online education tilted a support to this pandemic situation and it was instrumental in students learning process. However, simultaneously, students always preferred traditional teaching to online teaching. 47.9% of students did not prefer online classes due to many reasons and they felt that they had missed their real-time classroom learning experience. Contrastingly, 30.9% of students felt better and they were comfortable with online learning. However, 21.1% of students felt that both were similar and they did not find any differences between online vs traditional teaching methodology.



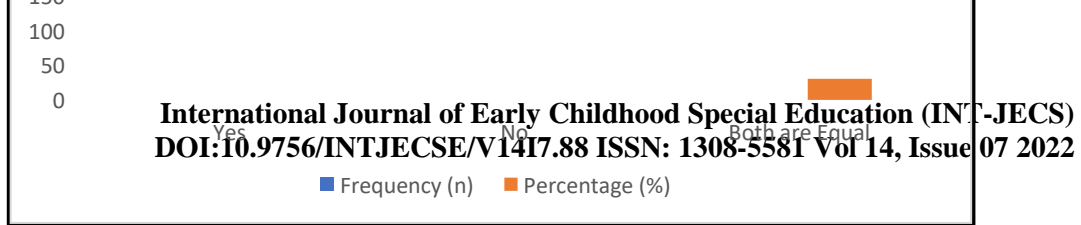


Figure 4.11.1: Online Vs. Traditional Teaching

4.12 Difficulties faced

During this Covid-19 period, students were indirectly forced to concentrate on their studies. Figure 4.13.1 reports difficulties faced by the students. This work list out major problems faced by the students during their online classes such as tower/network, computer/laptop/mobile phone technical, low bandwidth, mental stress, health and power supply problems. 83.2% of students had tower/network problem. Due to lack of network connection, many students were unable to attend their online classes properly. Establishing more tower was a crucial part of all the future needs in order to avoid interruption over the network. 17.4% of students encountered technical and 5.5% pupils battled with low bandwidth issues. 22.8% of students battled with mental stress. Whereas 19.3% faced health complexities, 16.4% suffered power supply problem.

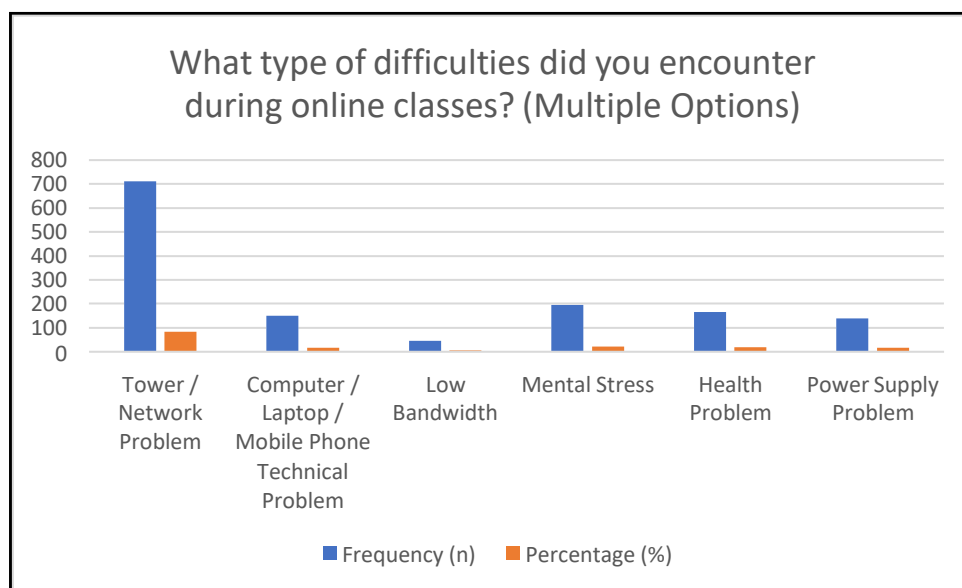


Figure 4.12.1: Difficulties faced

4.13 Benefits of online class

The benefits of online classes and examinations are discussed in figure 4.14.1. In this report, 43.8% of students learned a new technology through these online classes thanks to some colleges which are using ICT (Information and Communication Technology) tools to teach. Despite the fact that ICT tools helped student's community, they did not use their own devices to teach the classes. These online classes increased the usage of the devices and created an excitement for the students to learn a new technology from the hands of the colleges. 10.3% of students interacted with teachers regularly and asked questions. Since the reciprocal action or communication between the teachers and the students is more important for the learning

process, percentage wise, this interaction of 10.3% is very low. Nonetheless, 10.7% of students have understood the subject in a better way and received more technical inputs through these online classes. Additionally, younger generations were enthusiastic in learning new technologies and anticipated more technical inputs from the faculty. For these technical inputs, faculty members had to update and refresh themselves with the impending or upcoming technologies to fulfil their students’ needs in an effective way. Faculty members who were astute, brainy and inventive and who had a technically sound knowledge were able to easily impress the students to attend online classes. 19.6% of students were easy to connect with everyone because virtual technology connects most of the people in social media such as facebook, twitter, instagram and etc. Unlike 7.6% of students who learned more practical knowledge via online teaching, 31.9% of students accepted all the benefits mentioned above.

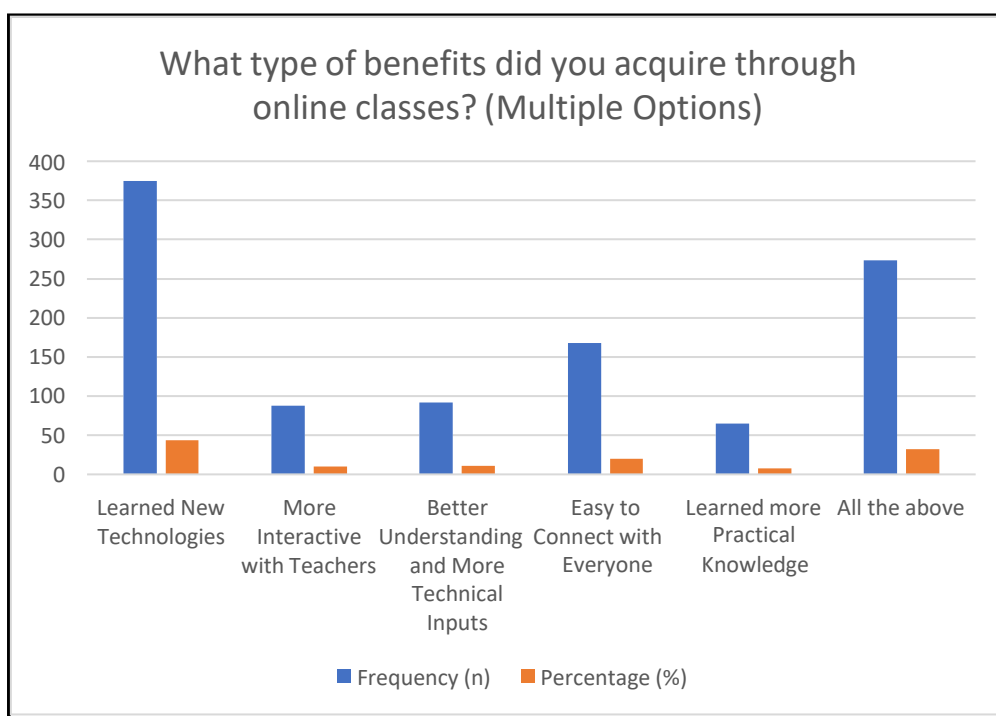


Figure 4.13.1: Benefits of online class

5. Conclusion


This research work focuses on real time systematic analysis of virtual education by ICT convergence technology during Covid-19 among students’ community especially, in higher education. For this work, quantitative research has been done based on online survey and qualitative research work has been obtained through responses received from various districts of Tamil Nadu, India. A large amount of input samples has been collected for this work and the input samples have helped analyze each category in an impeccable way that culminated in

optimal results. The statistical data obtained from the real time analysis clearly proves that the online classes have been an enormous successful teaching platform during this pandemic scenario. 79.8% of students have attended online classes effectively and the rest of the 21.2% have tried their best to attend the online classes. Nonetheless, they struggled hard due to technical, health and economical constraints. Even though this research work emphasizes that online education is not an alternative for traditional education, an innovative teaching platform is being continued throughout the year for the benefits of future generation.

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