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TECHNOLOGICAL CHALLENGES FACED BY STUDENTS IN ONLINE CLASSES DURING THE COVID-19 PANDEMIC

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Abstract

The COVID-19 pandemic has affected all modes of our lives such as social, economic, religious, and educational. It has forced the transition of the education system to online mode and with that many challenges related to the use of technology that was hidden emerged. This study was conducted to investigate such technological challenges faced by students in online classes during the pandemic. It also aimed at exploring different online teaching apps and their effectiveness.Qualitative research approach was adopted, six students from six different departments of the University of Okara, Pakistan were selected as a sample, and semi-structured interviews were conducted. After the data analysis procedures, different themes emerged as technological challenges for students. These are a lack of awareness of technology for both teachers and students, lack of technological resources, expensive internet bundles, and load shedding. Different online teaching apps that were mostly used for teaching purposes are Zoom, Google Meet, and WhatsApp. Since the COVID-19 pandemic has led to the widespread use of online teaching methods, this study will be helpful to combat future challenges related to the use of technology in online education.

1. Introduction

The coronavirus (COVID-19) pandemic took the world by surprise in December 2019 and along with all other systems of the world economies, it fundamentally changed the landscape of the education system as well. On March 12, 2020, COVID-19 was announced as a global pandemic and the stay-at-home policy was forced in all the affected countries to contain the problem and stop its further spread. All the affected countries had to close educational institutes to prevent the spread of coronavirus and it affected the education of millions of students around the globe. Management of school lessons, provisions of effective education, and arrangement of suitable online learning activities was among the major issues faced by the system of education. Advancements in technology have been useful in tackling such issues however even technology has its drawbacks. This study aims at exploring the issues related to technology faced by students during online classes in a newly established institute in Pakistan.However, it is imperative to discuss some common challenges faced by students, teachers, and the education system during the COVID-19 pandemic in light of existing literature.

2. Literature on challenges in online education

Esra and Sevilen, (2021) conducted a study entitled "factors influencing EFL students' motivation in online learning: A qualitative case study". This study aimed at exploring the perceptions of the students regarding online learning and how it affected their motivation. The results of this demonstrated that there is a negative relationship between online learning and the motivation of students. This negative relationship exists because of certain reasons such as lack of social interaction of students with teachers and other fellow students, the difference in expectations concerning the content delivered to the student, organization and technological problems, and the organization of the learning environment.

Chakraborty, Mittal, Gupta, Yadav, and Arora (2021) conducted a study entitled "opinion of students on online education during the COVID- 19 pandemic". This study was conducted to find the opinion of students on online education during the COVID-19 pandemic. The students reported some positive and some negative aspects of online education. The positive aspects included the convenience and usefulness of the online instruction during the pandemic, the quality of the software and online teaching tools used to

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provide online education, and the increase of digital skills among teachers and students. The negative aspects included stress, negative effect on health, and social problems.

Alawamleh, Al-Twait, and Al-Saht (2020) conducted a study entitled "the effect of online learning on communication between instructors and students during Covid-19 pandemic". The study aimed at exploring the effect of online education on the communication level between students and teachers. The results of this study indicated that a communication gap existed between teachers and students which was not apparent during the traditional mode of learning. Additionally, students preferred the traditional mode of learning over online learning because of different issues they face during online classes. These issues include lack of motivation, understanding of the content and subject matter provided to them, low communication and interaction between students and teachers, and the sense of isolation getting stronger because of online instruction.

Rajab, Gazal, and Alkattan, (2020) conducted a study entitled"challenges to online medical education during the COVID-19 pandemic". This study aimed to explore challenges to online medical education during the COVID-19 pandemic and involved higher education students and faculty members as the sample of the study. The results indicated that 41.8% of the total respondents had little or no experience with online teaching or learning before the pandemic, and 62.5% gave preference to the integrated learning systems i.e., a blend of online and face-to-face instruction. The challenges reported by this study were student assessment, use of technology tools, online experience, pandemic-related anxiety, technophobia, and time management. Overall, this study reported a positive impact of COVID-19 on online education.

Hussein, Daoud, Alrabaiah, and Badawi (2020) conducted a study entitled "exploring undergraduate students' attitudes towards emergency online learning during COVID-19: A case from the UAE". The results of this report on the positive aspect of online education are as follows: (a) cost and time effectiveness (b) convenience and (c) improved participation. The negative aspects as reported by study participants include (a) distraction and reduced focus (b) heavy workload (c) problems with technology and the internet and (d) insufficient support from teachers and other fellow students.

Ferri, Grifoni, and Guzzo (2020) conducted a study entitled "online learning and emergency remote teaching: Opportunities and challenges in emergency situations". This was a comprehensive study aimed at exploring the opportunities and challenges of emergency remote teaching-based experiences of the COVID-19 pandemic. The challenges emerged in three major themes namely technological, pedagogical, and social challenges. The technological challenges indicated in this study include (a) weak and unreliable internet and (b) lack of technological tools for students. The pedagogical challenges include (a) teachers' and students' awareness of technology and digital skills (b) lack of proper content matter against many different online teaching tools (c) lack of interaction and motivation of students and (d) teachers' absence in the classroom which can also be stated as lack of accountability for students. The social challenges found in this study include (a) lack of interaction between students and teachers and among students (b) lack of spaces in homes (c)family structure and environment and (d) lack of support from family

From the above discussion, we can conclude that most of the studies discussed the challenges related mostly to the health and social problems of the students while very few discussed the technical issues faced by students during online classes during the pandemic. This is the research gap of our study as we aim to explore the technological challenges faced by students at the University of Okara, Pakistan during the pandemic.

3. Significance of the study

Developed countries were well-equipped with technology-built-up systems, and the shift of education system to the web-based platform has just been an easy task, although their

teachers also took this sudden shift as a challenge or threat due to obliviousness to the online teaching system (Daumiller et al. 2021). However, many developing countries tend not to ensure fully online education mainly due to a lack of technological infrastructure and some other constraints like high rates of students from lower-income families not being able to purchase the internet and devices for online education (Ramij and Sultana, 2020).

This study is significant as it helps to deeply explore the technical challenges faced by students during online classes. It uncovers all the hurdles related to technological devices, internet connections, and the pros and cons of different online teaching apps and platforms. This study is significant as it helps the teachers and higher education institutes to understand what needs to be done to ensure the effective learning of students by overcoming different challenges related to the use of technology.

4. Research Questions:

1) What are the challenges faced by students related to the use of technology in online learning?
2) What are the pros and cons of different online teaching apps?

5. Methodology:

This study was qualitative in nature. Interpretative Phenomenological Analysis (IPA) was used as a methodology to explore the lived experiences of students attending classes online. The purpose was to highlight technological challenges as consciously experienced by students at this university during online classes for attending the first time during the COVID-19 pandemic. This area lacked information provided by students about the challenges faced by them during online classes, which guided the choice of phenomenology (Creswell and Poth 2016). The descriptive phenomenology assisted the participants in articulating their lived experiences, observations, and viewpoints that were significant to online learning (Creswell and Poth 2016; Morrow et al., 2015).

6. Participants

Data were collected from students who have attended online classes for one year or more. The sampling technique for this study was purposive. Six participants (students) were interviewed for the study. The recruitment and interviews of participants continued till data reached its point of saturation and new themes stopped emerging (Javadi and Zarea 2016).

The inclusion criteria for the participants in the study were limited to university Students engaging in online classes for the first time in their study career during the COVID-19 pandemic. Only those students were interviewed who were class representatives in their classes as they had more interaction with faculty and students as compared to any other student. Students were recruited purposefully from six different departments of the university.

7. Interview Procedure

A semistructured interview was used to explore the technological challenges faced by students during online classes. Moreover, they were asked about the pros and cons of different online teaching apps. The study also examined the prevailing conditions of stress due to the transition to online teaching during the COVID-19 pandemic. The questions were modified according to the flow of the conversation. The participants responded to questions such as the following:

i. What is your experience of online teaching during the COVID-19 pandemic?
ii. How would you describe the technological challenges faced during online classes?
iii. How would you explain the level of technology awareness among teachers and students?
iv. How would you explain the availability of different technological resources?
v. What are the different online teaching apps that are used mostly?
vi. What are the pros and cons of different online teaching apps?

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vii. How do electricity problems in the country affect online learning processes?

After the completion of every interview, the main points related to our study were summarized. Interviewees were also asked to provide a summative conclusion of the interview, additional comments, and feedback. All of these were incorporated into existing data. After completion of the interview process, they were transcribed. Since the interviews were conducted in our native language, they were transcribed accordingly and after transcription, were converted into the English language. A pilot interview was conducted to ensure and increase data credibility (Forero et al. 2018). The data collection and data analysis processes were carried out stage-wise. The first stage comprised the recruitment of the participant and the time and mode of the interview were discussed and decided. The purpose and objectives of the study were explained to the participants in the second stage. In the third stage, the interview was conducted and the main points were summarized

8. The Procedure of Data Analysis

Thematic analysis that comprises a six-step model (Braun and Clarke, 2006) was employed to have a deeper understanding of students' experience with online classes and to interpret their behavior. In the first stage, the researcher transcribed the data in Urdu language and then translated it into English. The data obtained was read twice to develop familiarity with emerging themes. Moreover, the important lines were highlighted and the log was maintained. In the second stage, MS Word was used to code the data obtained. Each interview was coded by two researchers to enhance the credibility of the coding process.

Similar codes were grouped and the first emerging themes, and mind maps were constructed using inductive thematic analysis in the third stage (Thomas, 2006). In the fourth stage, the emerged themes were compared with the already obtained codes to check the coherence of the pattern of themes. One of the fellow researchers who had little knowledge of literature regarding this study developed a mind map independently and the final thematic map was constructed after extensive discussion and contemplation (Gani et al. 2020).

In the prefinal stage, the results were discussed with peers and they were briefed about the study's purpose. After debriefing with peers the final draft was written in the final stage. It involved logical rationalities and direct quotes from the participants. This was done to ensure the credibility of the findings of the study. These steps based on the six-step model of thematic analysis ensure the credibility, dependability, transferability, and conformability of the research (Nowell et al. 2017).

9. Ethical Considerations:

Following are the ethical considerations of the study:

i. Written informed consent of the participants was taken
ii. Participants were informed about the purpose and major objectives of the study
iii. Participants were ensured that their data i.e., name, department, etc. will be kept confidential
iv. Verbal consent was taken before recording
v. Interviews were conducted and recorded via Whatsapp calls and Zoom meetings.

10. Results

After the process of data analysis, several themes emerged related to the technological challenges faced by students during online learning. These themes include teachers' awareness of technology, students' awareness of technology, lack of technological resources, different online teaching apps, expensive internet bundles, and load shedding problems. These themes are discussed using logical rationality and direct quotations from the participants.

10.1.Technology awareness:

In the traditional mode of learning, students are not well equipped with technology or trained in utilizing technology for effective learning. They remain unaware of different

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innovative methods of learning and how technology can help them to achieve greater objectives in their education. Furthermore, teachers also don't utilize technology in the process of teaching so they also remain unaware of the utilization of technology in the teaching process.

Online education was new to both teachers and students as they were unfamiliar with this type of teaching-learning system. Not only did students face difficulties in online learning but teachers also found it difficult to teach online. Teachers who taught well in physical classes failed to actively engage their students for effective learning. They were not familiar with online teaching tools and had no experience with this type of teaching. They did not deliver their lectures effectively or could not fully utilize the available online resources for better learning.

As R1 stated,

> *"Teachers who taught effectively in the traditional mode of learning could not teach well in online mode. Perhaps they were unfamiliar with the concept of "learning through technology". This led to a decrease in the interest of students. Teachers could also be provided training for effectively utilizing technology for better engagement of students and achievement of improved positive outcomes."*

Furthermore, teachers did not know of the major online teaching platforms. Different teachers used different platforms for teaching and all the teachers failed to be on one page regarding the use of online teaching platforms. Some teachers only used WhatsApp for teaching during online classes even though many other effective platforms such as google meet or zoom apps were there to utilize. Teachers also did not teach effectively and traditionally delivered lectures on online apps.

As respondent R4 stated,

> *"Our teachers preferred teaching on WhatsApp through voice notes instead of taking real-time classes on Zoom or Google Meet. This led to our disengagement from the class as it gets boring to simply listen to the lectures without proper visualization of the material being learned"*

Thus, teachers' lack of awareness regarding the use of technology and innovative methods ofo online teaching impeded the effective learning of students and resulted in the loss of motivation and interest.

10.2.Students' awareness of technology

Students also did not have the experience of utilizing technology for educational purposes. Many students did not even have mobile phones or laptops when they first came to university. Many of them never used a smartphone or laptop for educational or other purposes. So it was a completely novel system of learning especially for first-semester students of undergraduate programs. Moreover, students were not used to attempting question papers online on different forums such as meet, google classrooms, university LMS systems, or google forms and surfing the internet for solving open book questions so they faced difficulty in attempting papers and many students couldn't even complete their papers on time.

R4 stated,

> *"I bought android mobile during the pandemic and learned to use it. Since I was not familiar with so it felt boring to take lectures and sometimes, I failed to attend the class. Moreover, I was unaware of the online examination system and even faced connectivity issues as I live in a remote area."*

R5 said,

> *"Students unfamiliar with technology solved their papers but forgot to press the submit button and ended up getting zero in their exams. It wasn't their fault or their teachers' fault rather it can be credited to lack of awareness of technology."*

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Students and teachers didn't know the proper use of devices and tools for taking classes and online exams but many of these issues can be resolved through training and development programs for teachers.

10.3.Lack of technological resources:

Online education is not possible without having good access to technological resources. Internet accessibility is the most important component of online education. The respondents of this study reported that they had to face weak internet signals problems during an online class. Especially students of rural areas faced this difficulty at an extreme level. In those areas, sometimes internet speed was very slow and sometimes it was fast.

R1 explained,

> *"We have faced extreme difficulty in the second semester; we were on terraces of our houses trying to catch signals and send papers in the scorching heat of the sun when the temperature was high. But we had to send our papers on time no matter how difficult it was for us."*

R2 explained,

> *"I belong to a rural area where internet speed is very low. Sometimes even we lost our mobile network. Sometimes teacher's voice is not clear. I cannot download or watch the videos shared by our teacher. This is all because of poor internet signals."*

Different types of internet networks operate in Pakistan and each network has its shortcomings especially when it comes to rural areas. There is no consistency in internet signals. At the time of load shedding, the internet signals are distorted so much that the speed almost comes down to zero bytes. It gets hard to even make a phone call while using the internet gets out the option.

As R3 explained,

> *"The towers of X network in our areas shut down at the time of load shedding. They don't have any generators to provide the electricity to keep functioning. So they don't spread internet signals and we cannot attend our classes. Sometimes we even miss our exams and teachers deduct marks for late submission of the solved paper."*

Additionally, teachers send students long videos of lectures that comprise heavy storage and need a stable internet connection to be downloaded. Teachers ask the students to download these videos immediately and then provide their responses within a very short time. Many students fail to download the videos in the given time so they cannot possibly listen to them and respond to their teachers. Thus, the teachers either mark absent these students or deduct their sessional marks.

R6 explained,

> *"Teachers send links of long videos of almost 30-60 minutes duration. If there's any network issue, videos could not be downloaded. During zoom classes, because of Internet issues, we could not hear teachers properly."*

10.4. Online teaching apps

During online classes, teachers used different tools and apps for taking online classes. They selected tools and apps according to their suitability and did not consider the facilities available to students. These apps and online webs include Google Meet, Zoom, Google Classrooms, and Mircosoft Team among others. In the present study, It was found that teachers mostly used Whatsapp and Zoom apps for teaching online classes.

Classes conducted on zoom were worse than WhatsApp classes because the Zoom app, Google Classroom, and Google Meet apps required fast internet speed which was not possible. Teachers' voices got distorted and it was unclear to listen. So students' couldn't understand whatever teachers taught them. On the Zoom app, only a few students would attend the classes because others have problems with weak internet signals. They couldn't

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attend the class due to a bad network connection. Students had suffered in terms of academic learning and also they were not able to show good performance in many other class activities including presentations, tests, Viva, or exams due to slow internet services in their hometown areas. In this situation, teachers need to cooperate with their students but our respondents indicated that the teachers are short-tempered and don't cooperate.

R2 explained,

> *"The teachers don't cooperate with us while students try their best to do so. We have to face many issues related to the internet in online education such as sometimes internet speed becomes too slow and sometimes it gets fast. Teachers say that sit there where internet signals are good. We go outside the room but there is not much difference in internet speed inside or outside the room. Whenever a class is conducted on Zoom, the teacher's voice gets distorted after every single second which is not possible to listen to whatever is being said. We have to join and leave the meeting again and again. So, we can't understand what is being taught to us."*

R4 added,

> *"Whenever teachers deliver lectures on Zoom, we miss many lectures because of Internet issues. Due to weak signals, we cannot attend lectures properly."*

Some teachers also changed the apps according to the students' feasibility.

As R3 explained

> *"At the start of online classes, our teachers asked that we will have our classes on zoom meeting. In the beginning, we had some classes on zoom meeting but the internet speed was not good. There were very weak signals. Sometimes the speed of the internet becomes too slow so we are unable to connect to the Zoom meeting. That's why we requested our teachers that we cannot take classes on the Zoom app so please can you use some other online platform. Our teacher accepted our request and from that day out classes are conducted on WhatsApp."*

R1 also added,

> *"Our lectures are conducted on the zoom app which requires a strong internet connection. Most students are from rural areas where there is always an internet issue. So classes on WhatsApp are a good option in this case. All students attend class on WhatsApp but mostly remain absent in zoom class. While solving papers on Google meet, we have to face internet problems. Due to this problem our marks get deducted. Then many students requested teachers to conduct their exams again. Vivas was also conducted on zoom meeting but due to connectivity issues we got poor marks because we couldn't answer immediately."*

Students also faced issues while attempting exams on online apps. Some teachers had set a time limit to solve a certain question. Because of connectivity issues, many students could not submit their answers even though they had solved the questions at the given time. The teachers did not accept any excuse and deducted their marks. There were problems while delivering presentations. The voice is distorted or PowerPoint presentations are not visualized clearly. So teachers give fewer marks. Our participants also reported that their parents used to bash them for climbing the roof and sitting under the sun. But they had no option as they could only connect to the internet on the roof as there were no signals in the rooms.

R5 explained,

> *"In online classes, internet issue is the most problematic for me. In my area network connection is very poor. For this reason, I feel difficulty in taking classes. When it's my presentation, then it becomes more difficult for me to handle that issue. If I'm unable to present in a better way I get fewer marks. It is about yesterday that it was bad weather. The signals got disturbed because of rainstorms. It was my presentation then, but I couldn't present due to slow network signals. Moreover,*

classes conducted on Zoom are far more difficult for me to attend. This education system is unfair for the students who belong to rural areas."

10.5.Expensive internet bundles

During COVID-19 inflation rose to the highest levels in our country. Different internet network providers also increased the rate for internet packages and tax rate on balance sharing. Students studying at the university under study mostly belong to rural areas and belong to families with unstable financial conditions. Attending real-time online classes, downloading and watching videos, and extensive web searches required a heavy amount of internet data and the bundles were very expensive. It was difficult for students to afford these packages.

Most of the students had weak packages or some had monthly internet data bundles. When teachers didn't send lectures according to schedule then sometimes their data bundles got expired. So they couldn't attend the lecture at that time. Videos of the lectures were too long that their MBs were all used while listening to the videos. For those long videos, heavy Packages were required. Moreover, the Zoom app, Google Classroom, and Google Meet the required fast and good internet connection. That's why students had to buy expensive internet packages to attend the class.

R2 explained,

"As students, we all have limited pocket money and every student has data package according to his/her needs, there is no appropriate schedule for the classes and teachers schedule their classes according to their availability but some of us don't even have data left at that time which is not a good practice for teachers. Moreover, some videos shared are so large that they require heavy and expensive data packages to watch, I'm a victim of this type of scenario where I sat to watch a shared video, and only after 10 to 15 minutes, my MBs were all used."

R6 explained,

"Some of our lectures are conducted on Google class meet which requires strong internet signals and its package is also expensive."

Learning through technology was much more difficult for different reasons related to technology. Video lectures sent by the teachers were too much heavy that no space would be left for some more lectures. Videos of the lectures consumed heavy storage. For downloading or storing new data, students had to delete all the previous data. In this way, much of their important material would be lost.

R4 explained,

"There is a teacher who sends ten videos at a time of almost 25 minutes duration each. We cannot watch the whole video because of a network issue. When we download videos there remains no storage on mobile. We have to delete the data for midterm to generate storage for files for the final term. In this way many times we lost the whole data, and then we have to backup all data. Sometimes it's not possible to have the backup of all of the lost data."

10.6.Electricity problems

Load shedding is a major problem in Pakistan and some other developing countries. Since when the trend of online education began, load shading became more problematic for students because all the technological devices require electricity for their proper functioning. In online classes, students faced load shading issues and it became more difficult when they had to take exams. In many areas network signal connections were lost along with the loss of power supply. Students had to submit their papers after the submission time which affected their grades. They were given fewer marks due to the late submission of the paper.

R3 explained,

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"There are signal issues in our area. We cannot submit our paper on time which leads to the late submission of paper because there are some villages where there is a severe problem with load shading. The power supply goes off from 9 a.m. to 3 p.m. which is the time to attempt the paper. Signals connection is lost as the power supply goes off. So, we have to submit our paper at 3 p.m. I had to tell my teacher that there was such type of issue that's why I couldn't submit my paper on time. Some teachers accept my paper but it affects my grades."

11. Summary of the results

This section described our results in the light of the quotations of our respondents. The major themes discussed were teachers' awareness of technology, students' awareness of technology, lack of technological resources, different online teaching apps, expensive internet bundles, and load shedding problems. It was explained that teachers were not properly aware of the proper use of technological resources. They adopted traditional techniques of teaching during online classes. Students were not familiar with this form of learning and many students did not even have android phones before the pandemic. In the next theme, the lack of technological resources and the absence of laptops and mobile phones from our participants have been discussed. The pros and cons of different apps and why teachers converted from one app to another, from one platform to another have been discussed in the light of our respondents' opinions. Expensive internet bundles and electricity problems were also the major challenges that impeded the effective learning of the students during the pandemic.

12. Discussion

The major aims of this study were to investigate the technological challenges faced by students in online classes during the pandemic. Moreover, this study sought to uncover the effectiveness and use of different online teaching apps.

The results of our study indicated that major technological challenges were awareness of technology, lack of technological resources, expensive internet bundles, and load shedding. Our respondents reported several apps that were used for online teachings such as Zoom, Google Meet, Google Classroom, and WhatsApp. However, they had to adopt WhatsApp as the final app for teaching because of the fast internet required for other apps.

Awareness of technology has been a major issue identified in previous research as well.Ferri, Grifoni, and Guzzo (2020) conducted a study entitled "online learning and emergency remote teaching: Opportunities and challenges in emergency situations". They highlighted a lack of awareness of technology as a major challenge for students as well as teachers. Moreover, the lack of digital skills of students and teachers impeded the effectiveness of online classes. Hussein, Daoud, Alrabaiah, and Badawi (2020) also reported similar results stating that problems with technology and technology awareness are among the major issues of online education. Our results show coherence with the results of the above-given studies. Students expressed concerns about the teachers' knowledge of technology and the use of different online teaching tools. Furthermore, we found out that students also had little or no knowledge of online learning.

Our second major theme was the lack of technological resources that students faced. Many of the students did not have android phones or laptops when they first entered university and some did not even use these devices. Proper internet services were unavailable and students couldn't attempt their papers or attend classes because of weak connectivity issues. This theme correlates with other major issues reported by our participants i.e., load shedding and expensive internet bundles. Our participants indicated that most of the students studying at their university belong to rural areas and middle-class families. Internet bundles are too expensive for them and they have to buy a lot of data to attend real-time classes or download the lectures sent by their teachers. Load shedding also disturbs their routine activities. Many times, the teachers conducted exams during load shedding hours. Internet

services are shut down during these hours and students cannot attempt or submit their papers. All of these issues are related to the scarcity and effectiveness of technological resources, however, these challenges are described under different themes in data analysis.

These findings correlate with the findings of many studies conducted regarding the challenges in online education. Ferri, Grifoni, and Guzzo (2020) reported weak and unreliable internet as a major technological challenge encountered by students.Hussein, Daoud, Alrabaiah, and Badawi (2020) reported problems with technology and the internet as a challenge for students during their online classes. Further studies such as Esra and Sevilen, (2021), Chakraborty, Mittal, Gupta, Yadav, and Arora (2021), Alawamleh, Al-Twait, and Al-Saht (2020), and Rajab, Gazal, and Alkattan, (2020), report weak and unstable internet, lack of technological resources, and unreliable technology instruments as a hurdle for effective online education.

13. Findings

Following are the major findings of this study.

1. Teachers who taught well in physical classes failed to actively engage their students for effective learning. They were not familiar with online teaching tools and had no experience with this type of teaching. They did not deliver their lectures effectively or could not fully utilize the available online resources for better learning.

2. Students also did not have the experience of utilizing technology for educational purposes. Many students did not even have mobile phones or laptops when they first came to university. Many of them never used a smartphone or laptop for educational or other purposes. Moreover, students were not used to attempting question papers online on different forums such as Google Meet, Google Classrooms, university LMS systems, or google forms and surfing the internet for solving open book questions so they faced difficulty in attempting papers and many students couldn't even complete their papers on time.

3. There was a lack of technological resources. Several students did not have access to android phones or laptops. Moreover, weak internet connections or no internet service at the time of load shedding turned out to be a major hurdle for students that affected their education negatively.

4. Because of weak internet connection, students could not attempt their papers on LMS systems or they failed to submit their papers in time. They could not properly listen to their teachers and could not present their topics effectively which resulted in the deduction of marks.

5. Online teaching apps such as Zoom, Google Meet, and Microsoft Team require heavy internet for real-time online classes. Because of connectivity issues, these apps were not effective. Eventhough these apps were good for online learning but weak internet disturbed their normal functioning thus, students and teachers had to move to WhatsApp for online classes.

6. Different internet network providers also increased the rate for internet packages and tax rate on balance sharing. Students studying at the university under study mostly belong to rural areas and belong to families with unstable financial conditions. Attending real-time online classes, downloading and watching videos, and extensive web searches required a heavy amount of internet data and the bundles were very expensive. It was difficult for students to afford these packages.

7. All technological devices require electricity for proper functioning. Load shedding proved to be a major challenge for students as the internet connection was lost when the electrical power supply goes out.

14. Conclusion

Conclusively, this study aimed at investigating the challenges related to technology faced by students during online classes. Additionally, the effectiveness of different online

teaching apps and the availability of different technological resources were also explored as per the experiences of students. This study adopted a qualitative research approach and semi-structured interviews were conducted to obtain data from study participants. The results obtained from data show that teachers and students were unfamiliar with the online mode of learning. Teachers had little knowledge of different online teaching tools and their effectiveness. Students were unaware of the world of the internet. The students face a shortage of technological resources i.e., a lack of mobile phones and internet services. Students and teachers both preferred WhatsApp over other online teaching apps such as Zoom or Google Meet because it did not require a fast internet connection. Load shedding problems in the country also deterred the proper learning of students in online settings. Overall, this study is significant in determining the major technological challenges and helps devise ways to overcome these challenges to improve the system of online education.

15. Recommendations

Following are the major recommendations of the present study.

1. In this study, only students were selected as participants and their experiences regarding the technological challenges have been described. However, on the other side of the coin, teachers could also have several challenges in this system. The researchers are recommended to consider teachers as research participants as well and explore their side of the story, their challenges, and their experiences.

2. This study had limited scope and involved one university that was a newly established institute. However, researchers are recommended to expand the scope of the study and conduct a study over a wide range of institutions. Furthermore, this study was only conducted in higher education settings but the mode of teaching was online for secondary and higher secondary schools as well. Researchers are recommended to study the issues of students and teachers in secondary and higher secondary school settings as well and may compare them with issues in higher education.

3. It is recommended to the higher education authorities initiate training programs for technological development among students and teachers. They should be made aware of the uses of technology in education.

4. The system of online education is a good initiative for the universalization of education in our country. This system should be blended with the traditional mode of learning. The challenges and issues should be eliminated with time to make them more effective and approachable for all societies.

16. References

Alawamleh, M., Al-Twait, L. M., & Al-Saht, G. R. (2020). The effect of online learning on communication between instructors and students during Covid-19 pandemic. *Asian Education and Development Studies*.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, *3*(2), 77-101.

Chakraborty, P., Mittal, P., Gupta, M. S., Yadav, S., & Arora, A. (2021). Opinion of students on online education during the COVID- 19 pandemic. *Human Behavior and Emerging Technologies*, *3*(3), 357-365.

Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.

Daumiller, M., Rinas, R., Hein, J., Janke, S., Dickhäuser, O., & Dresel, M. (2021). Shifting from face-to-face to online teaching during COVID-19: The role of university faculty achievement goals for attitudes towards this sudden change, and their relevance for burnout/engagement and student evaluations of teaching quality. *Computers in Human Behavior*, *118*, 106677.

Esra, M. E. Ş. E., & Sevilen, Ç. (2021). Factors influencing EFL students' motivation in online learning: A qualitative case study. *Journal of Educational Technology and Online Learning*, *4*(1), 11-22.

Ferri, F., Grifoni, P., & Guzzo, T. (2020). Online learning and emergency remote teaching: Opportunities and challenges in emergency situations. *Societies*, *10*(4), 86.

Hussein, E., Daoud, S., Alrabaiah, H., & Badawi, R. (2020). Exploring undergraduate students' attitudes towards emergency online learning during COVID-19: A case from the UAE. *Children and youth services review*, *119*, 105699.

Hussein, E., Daoud, S., Alrabaiah, H., & Badawi, R. (2020). Exploring undergraduate students' attitudes towards emergency online learning during COVID-19: A case from the UAE. *Children and youth services review*, *119*, 105699.

Javadi, M., & Zarea, K. (2016). Understanding thematic analysis and its pitfall. *Demo*, *1*(1), 33-39.

Morrow, R., Rodriguez, A., & King, N. (2015). Colaizzi's descriptive phenomenological method. *The psychologist*, *28*(8), 643-644.

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International journal of qualitative methods*, *16*(1), 1609406917733847.

Rajab, M. H., Gazal, A. M., & Alkattan, K. (2020). Challenges to online medical education during the COVID-19 pandemic. *Cureus*, *12*(7).

Ramij, M., & Sultana, A. (2020). Preparedness of online classes in developing countries amid COVID-19 Outbreak: A Perspective from Bangladesh. *Afrin, Preparedness of Online Classes in Developing Countries amid COVID-19 Outbreak: A Perspective from Bangladesh (June 29, 2020)*.

Thomas, D. R. (2006). A general inductive approach for analyzing qualitative evaluation data. *American journal of evaluation*, *27*(2), 237-246.