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Virtual Teaching and Learning Activities in the Schools during COVID-19 Period: Use and Effectiveness

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Abstract

This study investigates the state of online teaching and learning in schools during the COVID-19 pandemic, exploring challenges, strengths, weaknesses, and strategies to promote participation among students and teachers. Employing a mixed research method with an embedded design, both quantitative and qualitative data were gathered to provide a comprehensive understanding of the phenomenon. The study reveals widespread familiarity with online tools among educators and learners, despite initial hurdles such as poor internet connectivity and limited technology proficiency. However, shortcomings in student engagement and participation were observed, with many students exhibiting passive behavior during online classes. Concerns were also raised regarding the reliability of online assessments, highlighting the need for robust evaluation methods. Various obstacles to effective implementation, including internet accessibility and distractions at home, were identified. Recommendations for future practice include addressing internet access issues, providing LMS training for teachers, and promoting a conducive learning environment. This study offers valuable insights into the challenges and opportunities of online education during emergencies, guiding efforts to enhance its effectiveness in the future.

Keywords: *COVID-19, Virtual Learning, Effectiveness of virtual Learning, ICT, school level, Teaching and Learning.*

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Introduction

Online teaching and learning is an educational practice conducted over the Internet. This form of distance education is commonly known as e-learning. Online teaching involves the process of instructing individuals through online platforms (Allatta & Myers, 2023). Instructors can begin teaching from any place and enroll students from diverse backgrounds and regions without needing physical interaction. Likewise, online learning involves obtaining education through the Internet without attending a

traditional classroom. The post-pandemic era necessitates that both teachers and students have at least a functional laptop, desktop computer, or mobile device with reliable internet capabilities (Lamichhane, 2021).

In recent years, online teaching and learning have emerged as significant contributors to education in Nepal. Online teaching and learning have opened up new possibilities for students and educators alike, providing access to a wide range of educational resources and opportunities that were previously unavailable (Alqahtani & Rajkhan, 2020). Furthermore, online teaching and learning have proven to be particularly advantageous in a country like Nepal, where geographical barriers and limited resources often hinder access to quality education. Online teaching and learning in Nepal has brought flexibility into the education system, allowing students to learn at their own pace and from anywhere with an internet connection. Additionally, online teaching and learning have enhanced the accessibility of education in Nepal. Students from remote areas of the country, who previously had limited access to quality education, now have the opportunity to learn from highly qualified instructors through online platforms. This has not only expanded educational opportunities for these students but has also contributed to bridging the education gap between urban and rural areas. Moreover, online teaching and learning have proven to be cost-effective for both students and educational institutions. Students can save on transportation costs and the need to purchase physical textbooks, as most learning materials are available online.

Coronavirus disease 2019 (COVID-19), caused by the novel coronavirus later named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was first reported in Wuhan, China, in December 2019. The first case in Nepal was confirmed when a 31-year-old student who had returned to Kathmandu from Wuhan tested positive. Following this, the situation worsened, leading the Nepalese government to postpone educational activities and close all schools and educational institutions for safety. This shift necessitated the adoption and growing popularity of online teaching and learning.

In Nepal's education sector, there are 993,900 children aged 3-5 years enrolled in early childhood education development centers and pre-primary classes (ECED/PPE), and 5,165,186 children aged 5-12 years enrolled in basic education (grades 1-8). Additionally, 1,554,792 students aged 13-16 years are enrolled in secondary education (grades 9-12). There are a total of 35,055 schools, including community (state), institutional (private), and traditional (religious) schools. About 26% of all students in formal education (ECED through Grade 12) attend institutional schools. The country has 226,931 public school teachers, including 30,448 ECED/PPE teachers, and 119,679 teachers in institutional schools. A total of 2,544,025 students are enrolled in boarding schools, including 69,003 children with disabilities. Nepal has achieved gender parity in school enrollment at all levels. (Nepal Education Cluster, 2020).

According to education expert Elliot Masies, "We need to bring learning to people instead of people to learning." With an internet connection, anyone can attend livestream school lectures, learn languages through video calls, or take online video courses. Students can also engage in interactive discussions through small groups using various Web 2.0 tools. Typically seen as an alternative to traditional education, internet-based learning became essential for maintaining school and university activities during the Coronavirus pandemic. This approach was the most prominent social distancing measure to slow the virus's spread, which began in Wuhan, China, in December 2019 and has since become a global pandemic. E-learning tools have been crucial during this period, assisting teachers, schools, and parents in facilitating student learning during lockdowns. Many of these online tools, such as Zoom, Microsoft Teams, Viber, and Google Meet, are free, ensuring continuous learning. Among these, Zoom has been the most widely used application for educational purposes during the lockdown. (Khan & Hasan, 2020).

The government of Nepal announced a nationwide lockdown on 18 March 2020 to control the spread of the COVID-19 pandemic (Bhatta & Gyawalli, 2021) . On 31 May 2020, the Nepal Ministry of Education, Science and Technology (MOEST) issued a Guideline named “Guidelines for facilitating students' learning through alternative systems, 2077”. This guideline helps the Nepal education system to continue learning through various online mediums giving a clear guideline about how to conduct an online class (The Ministry of Education, Science and Technology, 2020).

The COVID-19 pandemic led to lockdowns and mandated the closure of all educational institutions, including schools, regardless of public opinion. The government couldn't risk the spread of the virus, as infection remained a possibility despite strict safety measures. This challenge was addressed through the use of various information and communication technology tools. To maintain educational continuity, schools transitioned from physical classrooms to online virtual classes, utilizing technology to facilitate this shift (Dhawan, 2023) . This online environment mandates everyone to learn and use technology, regardless of their preference, as it is essential for students and teachers to continue the education system. To evaluate the effectiveness of online classes during the COVID-19 period, the researcher focused on: Teacher-Student interaction, Collaboration tools for peer and group work, Various content creation and delivery tools, Technical support, Approaches used for formative and summative student evaluations, and Hardware and software used for online classes. After Nepal experienced a devastating earthquake in 2015, which led to the closure of schools for at least a month, the closure of schools during the COVID-19 pandemic posed another significant challenge. This research aims to study and analyze the situation of teachers and students during this critical time and to examine the use and effectiveness of various online communication and collaboration tools. The online teaching and learning process has proven to be an effective method for engaging students during the COVID-19 pandemic, enabling them to continue their education during lockdowns. Quarantine measures forced schools to close again, presenting a new challenge. Conducting classes with health safety measures still

posed a risk of virus infection. Consequently, online classes emerged as a productive and effective alternative for maintaining education. To understand the issues associated with online classes, several questions need to be addressed: What was the situation of online teaching and learning in schools during the COVID-19 pandemic? What were the challenges in implementing online education programs during the pandemic? What were the strengths and weaknesses of the online teaching and learning experience? How can we encourage students and teachers to participate in online classes?

Review of Related Literature

Online Learning

A series of educational experiences that use digital networks for interaction, learning, and dialogue. Online courses do not require face-to-face meetings in physical locations for effective learning. Similar courses, such as web-centric courses (also known as hybrid or blended courses), are similar to online courses but require regularly scheduled in-person classes and meetings (Rogers, et al., 2009). E-learning or online learning refers to the usage of modern information and communication technologies to deliver educational content to students. This learning mode can overcome physical distance. The phenomenon of e-learning became popular in the early 1990s due to the rapid evolution of the Internet (Bezovski & Poorani, 2016).

Online Learning Tools.

Online learning tools encompass a variety of platforms that offer educational services such as group discussions, digital resources, and prompt feedback (Forster & Kahan, 2023). These tools emphasize communication and engagement, providing features like educational games to captivate students. Among the different types of online learning tools are Learning Management Systems (LMS), which are comprehensive platforms for monitoring student performance and delivering online courses (Bradley, 2021). Google Classroom stands as one of the most utilized LMS platforms. Communication tools facilitate discussions between students and teachers through online forums and social media platforms like Facebook, Instagram, and WhatsApp (Dhull, 2019). Additionally, digital devices like computers, laptops, smartphones, and tablets serve as essential tools for accessing online education (Laptik, 2012). Connectivity resources, including broadband connections and wireless devices, are crucial for establishing connections between students and teachers (Lathram, 2014). Finally, technical support ensures the smooth operation of online learning by addressing computer and software issues and offering assistance through various channels like email and phone.

Methodology

In this study, a mixed research method with an embedded design was employed, deemed appropriate for addressing the research problem and questions effectively in the Maddhepurthimi municipality of Nepal. To comprehensively investigate the utilization and efficacy of online classes at the School level of Maddhepurthimi

Municipality, both quantitative and qualitative data were imperative. Employing an embedded mixed methods approach allowed for a holistic examination of the phenomenon. This methodological choice was deliberate, aligning with the primary focus on quantitative data obtained through a structured questionnaire, while also acknowledging the complementary insights provided by qualitative data gathered through observation. This comprehensive approach ensured a thorough exploration of the research objectives, enhancing the credibility and validity of the study findings.

Result and Discussion

Internet Service used in Online Class.

In online classes, internet service pertains to the broadband offerings supplied by diverse ISPs (Internet Service Providers) like WorldLink, Vianet, Webserver, Subisu, Skynet, and others. These services encompass ADSL (Asymmetric Digital Subscriber Line) and 4G internet services, along with 3G, 2G, and 1G services. Notably, each internet service varies in terms of speed and cost. The evolution of wireless broadband is delineated by different generations, each representing a distinct set of telephone network standards that delineate the technological framework of the system.

Internet Facility Used by Teachers.

The researcher examines internet services across five primary categories of variables. These categories include broadband/4G service, ADSL service, 3G service, 2G service, and 1G service utilized in secondary-level online classes. The provided figure illustrates the internet services employed by teachers during the COVID-19 pandemic for online instruction.

Table 1: Internet Facility Used by Teacher

S.N	Internet Service	Percentage of Respondents	No. of Respondents
1.	Broadband	86%	17
2.	ADSL	14%	3
3.	3G	0%	0
4.	2G	0%	0
5.	1G	0%	0

In Table 1 above, the data indicates that 86% of the teachers utilized broadband service, while 14% opted for ADSL service. Notably, there were no users reported for 3G, 2G, and 1G services. Consequently, the researcher concludes that the majority of teachers preferred broadband service, with 3G, 2G, and 1G services being nonexistent among them. This preference for broadband can be attributed to its superior speed compared to other internet services, alongside the provision of free broadband fiber optics internet facilities in schools by NTA. Additionally, the popularity of 4G internet service stems from its widespread use in mobile phones, offering convenient accessibility.

Internet Services Used by Students.

The following figure shows the internet services used by students for online classes during the COVID-19 pandemic. This is also categorized into 5 types. Broadband/4G, ADSL, 3G, 2G and 1G.

Table 2: Internet Facility Used by Students

S.N	Internet Service	Percentage of Respondents	No. of Respondents
1.	Broadband	87%	81
2.	ADSL	11%	10
3.	3G	2%	2
4.	2G	0%	0
5.	1G	0%	0

Table 2 illustrates that 87% of students utilized broadband service, 11% used ADSL, and 2% utilized 3G; however, no users of 2G or 1G were identified. This indicates a prevalent reliance on broadband, likely due to its superior speed and quality compared to other services. The absence of 2G and 1G users is attributed to their inefficiency in real-time online classes. While 3G service is available, its slow speed and limited bandwidth contribute to its lesser popularity. Broadband's popularity is further explained by its fast speed and high quality, facilitated by free fiber optics internet provided by NTA to schools. Additionally, the widespread use of 4G, accessible via mobile phones, contributes to its popularity.

Digital devices used in online classes.

A digital device encompasses a versatile computing tool like a smartphone, desktop, laptop, or tablet, capable of processing digital data. These physical objects store vast amounts of media, ranging from images and music to movies, contacts, and various documents, despite their compact size.

Digital devices used by Teachers.

Here researcher analyzes digital devices with five major categories. The following figure shows the digital devices used by teachers for online classes during the COVID-19 pandemic.

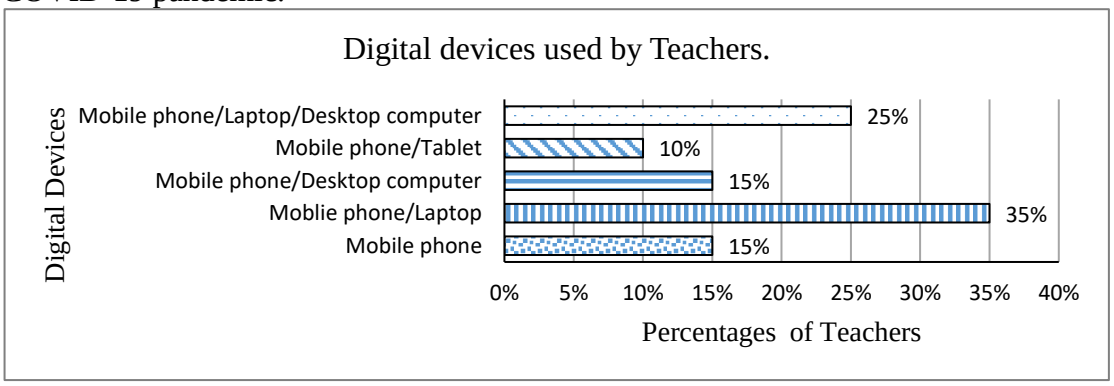


Figure1: Digital devices used by Teachers

In the above figure, 25% of teachers used mobile phones, laptops, and desktop computers as needed, while 10% used mobile phones and tablets, 15% used mobile phones with either desktop computers or tablets, and 35% used mobile phones with

laptops. Another 15% relied solely on mobile phones. The data suggests that most teachers preferred the convenience and affordability of mobile phones and laptops, with mobile phones being the favored choice due to their widespread use and lower cost compared to tablets.

Digital devices used by students.

The following figure shows the digital devices used by students for online classes

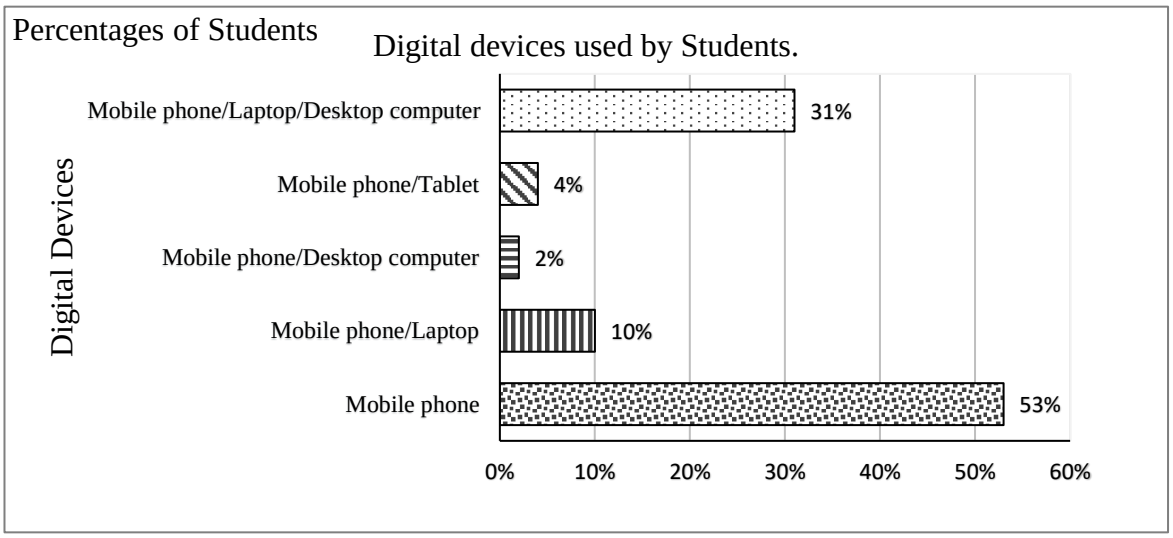


Figure 2: Digital devices used by Students

during the COVID-19 pandemic.

The data from the figure above shows that 31% of students utilized a combination of mobile phones, laptops, and desktop computers, while 4% used mobile phones and tablets. Additionally, 2% of students used mobile phones alongside desktop computers, and 10% used mobile phones alongside laptops. The majority, comprising 53% of students, relied solely on mobile phones. This suggests that most students preferred the convenience, affordability, and portability of mobile phones and laptops for their online activities. Mobile phones, being cost-effective and ubiquitous, were the preferred choice, with tablets being less popular due to their higher cost compared to mobile phones.

Supporting Software in the online class

Software platform used in online classes by teachers

The following figure shows the various software platforms used by teachers for online classes during the COVID-19 pandemic.

Table 3: Software Platform Used in Online Class by Teachers

S.N	Software application	Percentage of Respondents	No. of Respondents
1.	Zoom/Messenger	50%	10
2.	Zoom/Viber	20%	4
3.	Zoom/Google Meet	15%	3

4.	Zoom/Microsoft Team	5%	1
5.	Zoom/Viber/Messenger	10%	2

In the above Table, 50% of teachers used Zoom and Messenger, while 20% used Zoom and Viber. Moreover, 15% used Zoom and Google Meet, and 5% used Zoom and Microsoft Teams. Another 10% used Zoom, Viber, and Messenger. The data suggests that most teachers favored Zoom and Messenger for their ease of access, user-friendly interface, and compatibility with various smartphones, unlike Microsoft Teams, which was less popular due to its complexity and lack of compatibility with lower-end mobile phones.

A software platform used in online classes by students.

The following figure shows the various software platforms used by students for online classes during the COVID-19 pandemic

Table 4: Software Platform Used in Online Class by Students

S.N	**Software application**	**Percentage of Respondents**	**No. of Respondents**
	Zoom/Messenger	52%	48
2.	Zoom/Viber	32%	30
3.	Zoom/Google Meet	8%	7
4.	Zoom/Microsoft Team	4%	4
5.	Zoom/Viber/Messenger	4%	4

In Table 4, 52% of students used Zoom and Messenger, while 32% used Zoom and Viber. Additionally, 8% used Zoom and Google Meet, and 4% used Zoom and Microsoft Teams. Another 4% used Zoom, Viber, and Messenger. This suggests that most students preferred Zoom and Messenger due to their accessibility and compatibility with smartphones, unlike Microsoft Teams, which was less popular due to its complexity and lack of compatibility with lower-end mobile phones.

Communication Tool to communicate besides online class hours

Communication tools encompass various mediums such as email, telephones, cell phone calls or texts, web conferencing tools, social networking platforms, and online collaboration tools. During online classes, which typically run for four to six hours, these tools facilitate communication between teachers and students outside of class hours. This communication primarily pertains to interactions initiated by teachers to engage with students.

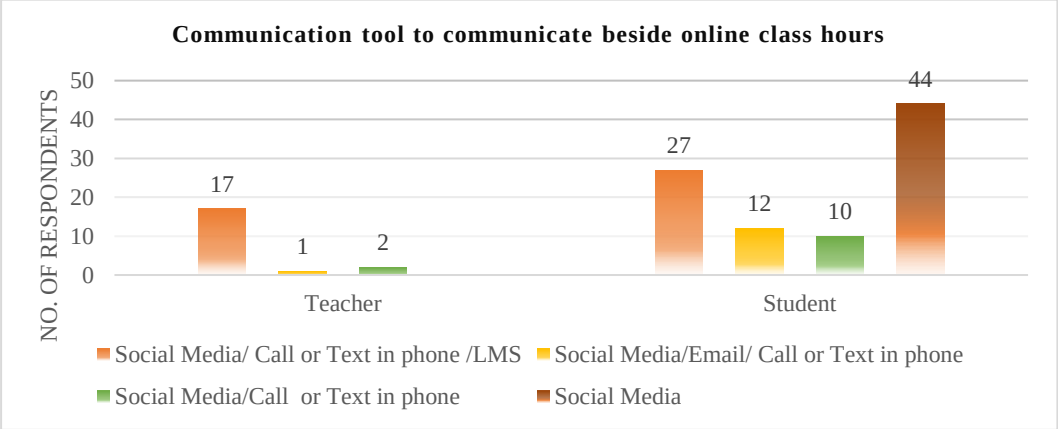


Figure 3: Communication Tool to communicate beside online class hours

In the above figure, the data reveals that 85% of teachers and 29% of students utilized a mix of social media, phone calls or texts, and Learning Management Systems (LMS). Meanwhile, 5% of teachers and 13% of students incorporated social media, email, and phone communication, while 10% of teachers and 58% of students solely relied on social media and phone-based communication. This indicates a clear preference for social media as a primary communication tool, likely due to its widespread accessibility, entertainment value, and affordability. Conversely, email usage was less prominent, with individuals often associating it with work-related correspondence and limited usage during specific hours.

Collaboration Tool used in online class

Collaboration tool refers to tools that help to collaborate and support a group of two or more individuals to accomplish a common goal or objective. With collaboration tools, students can do their work together although they are living in different physical places. Here, collaboration tools are shown in 4 categories based on collected data i.e. first, Google Docs users, second LMS tools users, third Google Doc and social media users and fourth those respondents who use all three.

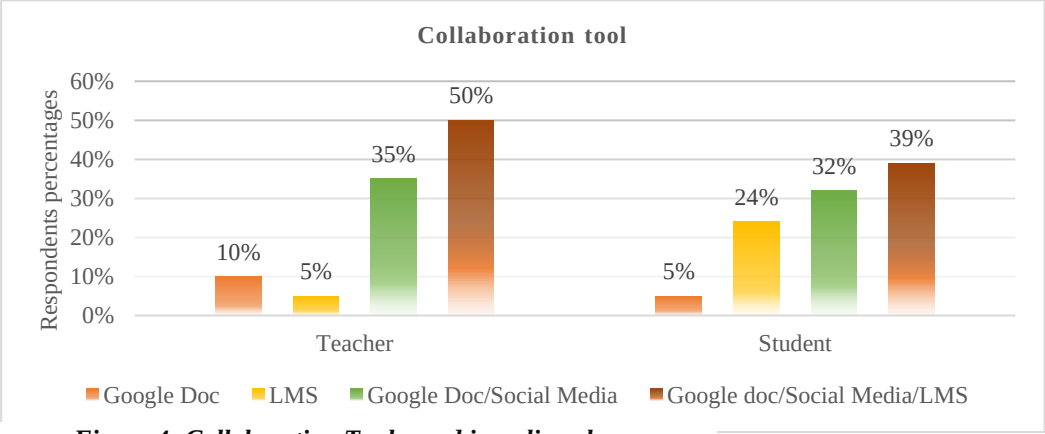


Figure 4: Collaboration Tools used in online class

In Figure 4, 10% of teachers and 5% of students utilized Google Docs, while 5% of teachers and 24% of students used Learning Management Systems (LMS).

Additionally, 35% of teachers and 32% of students employed both Google Docs and social media, and 50% of teachers and 39% of students utilized Google Docs, social media, and LMS software. This indicates that the majority of teachers and students primarily relied on Google Docs as a collaboration tool during the COVID-19 pandemic. Its popularity can be attributed to its user-friendly interface, real-time collaboration features, and similarity to familiar software like MS Word.

Dedicated Time for Online Classes

Here, dedicated hours refer to the total time students and teachers spend on online classes for teaching and learning programs. This is categorized into three categories i.e. first one to three hours, second four to six hours, and third seven to eight hours. The teacher's response and the student's response are shown in the following figure. This is the time duration teachers and students fully dedicate to online teaching and learning.

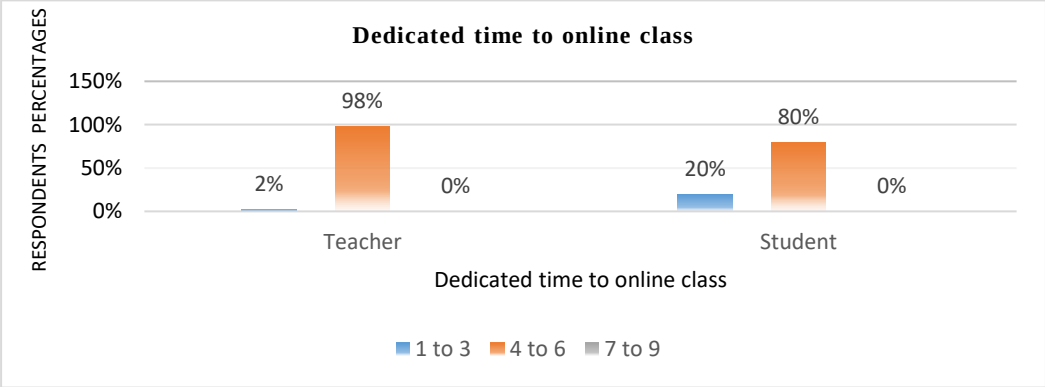


Figure 5: Dedicated time to online class

In the above figure, 2% of teachers and 20% of students allocated 1 to 3 hours, while 98% of teachers and 80% of students devoted 4 to 6 hours to online classes. No participants, neither teachers nor students, dedicated 7 to 9 hours. This suggests that the majority preferred dedicating 4 to 6 hours, mirroring the duration of traditional in-person classes. The absence of participation in 7 to 9-hour sessions indicates a reluctance to engage in such lengthy online sessions, likely due to the perceived fatigue and strain associated with prolonged screen time.

Time management in the online class.

Since online classes took place in participants' homes, they might have encountered disruptions from household chores or other factors. Consequently, this assessment of dedicated time management pertains to how effectively respondents handled their teaching and learning sessions. "Very well and peacefully" indicates that they could allocate time to online classes without significant disturbances, while "moderate" suggests they managed with minor disruptions. "Not at all" signifies they struggled to manage their time and were frequently interrupted by various tasks. To gain a clearer understanding, let us examine the following figure.

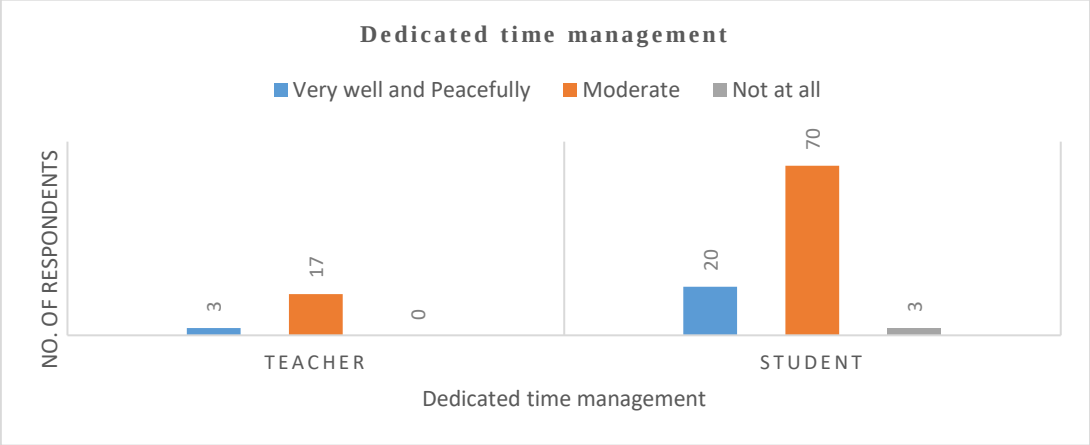


Figure 6: Dedicated time management

In Figure 6, 15% of teachers and 21.5% of students reported managing dedicated time very well and peacefully. The majority, comprising 85% of teachers and 75.27% of students, indicated moderate management. None of the teachers but 3.23% of students expressed not managing dedicated time at all. This suggests that most teachers and students handled their allocated hours moderately, while some students struggled due to factors like electricity and internet disruptions, as well as household responsibilities, during the COVID-19 pandemic.

Responsiveness and cooperation of Students in online classes.

Responsiveness and cooperation in online classes refer to how students respond to teachers' questions and react to assigned classwork or assignments. "Very responsive" indicates that students consistently and readily reply to teachers' questions. "Moderately responsive" means that students often reply, while "less responsive" signifies that students only sometimes reply. "Very less responsive" denotes that students rarely or hardly ever respond to teachers.

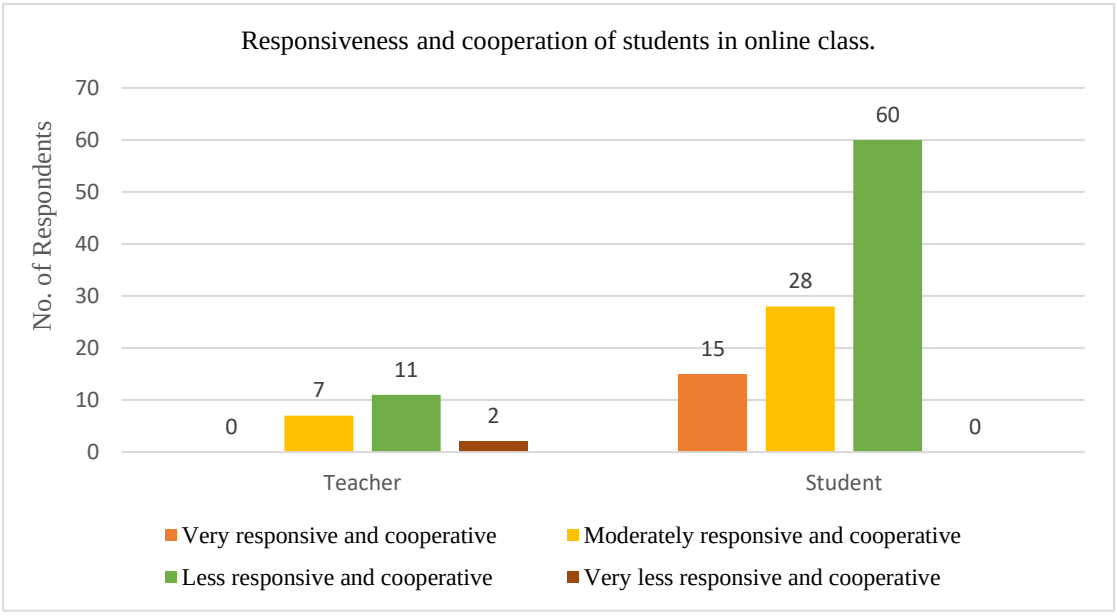


Figure 7: Responsiveness and cooperation of students in the online class

In Figure 7, the data shows that 0% of teachers and 17% of students reported being very responsive and cooperative. Meanwhile, 35% of teachers and 30% of students indicated they were moderately responsive and cooperative. The majority, 55% of teachers and 54% of students were less responsive and cooperative. Additionally, 10% of teachers and 0% of students were very less responsive and cooperative. This indicates that most teachers and students were moderately responsive and cooperative. Often, teachers' questions directed at the whole class led to student apathy, with many assuming others would respond, resulting in a lack of active discussion. Only a small number of participants were very responsive and cooperative during online classes during the COVID-19 pandemic.

Responsiveness of Teacher.

Here, the responsiveness of the teacher refers to how well teachers reply to student's questions and confusions. The teacher's responsiveness from the teacher's point of view and the teacher's responsiveness from the student's point of view are shown in the following figure in two sections. Here, very responsive refers to the teacher's reply to student's questions regularly without any hesitation, moderately refers to the teacher's reply more often, less responsive refers to the teacher's reply sometimes, and very less responsive refers to the teacher's reply to their student rarely and very hardly.

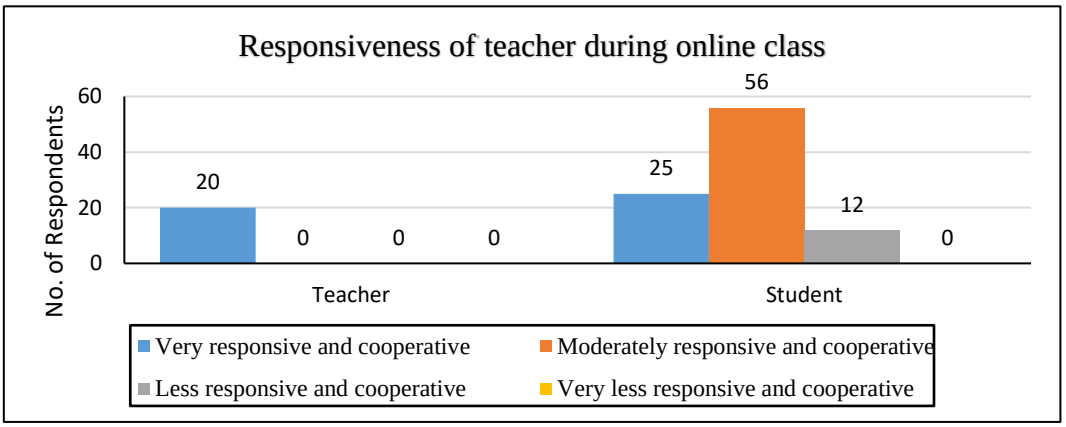


Figure 8: Responsiveness and cooperation of teacher during online class

In Figure 8, the data reflects how well students answered their teachers from both the teachers' and students' perspectives during online classes amid the COVID-19 pandemic. All teachers (100%) and 26.89% of students rated the students as very responsive and cooperative. Meanwhile, 60.22% of students viewed themselves as moderately responsive and cooperative, and 12.9% considered themselves less responsive and cooperative. None rated themselves as very less responsive and cooperative.

Thus, we can conclude that all teachers perceived themselves as very responsive and cooperative, while most students viewed themselves as moderately responsive and cooperative. This is likely because teachers, being responsible for the overall conduct of the online class, needed to be consistently responsive and cooperative. On the other hand, students might have expected others to answer questions, leading to less active

participation. This suggests that teachers were generally more active and responsive compared to students.

Disturbance in online class experience

Online classes are held in the respondent's own house. Since respondents are in their place various aspects may create hindrances while taking online classes. Here, disturbance refers to disturbance created by their friends, family members, neighbors, and roommates. The following figures show disturbance into 3 categories i.e. disturbance by their friends, roommate, and neighbor constantly, sometimes, and never.

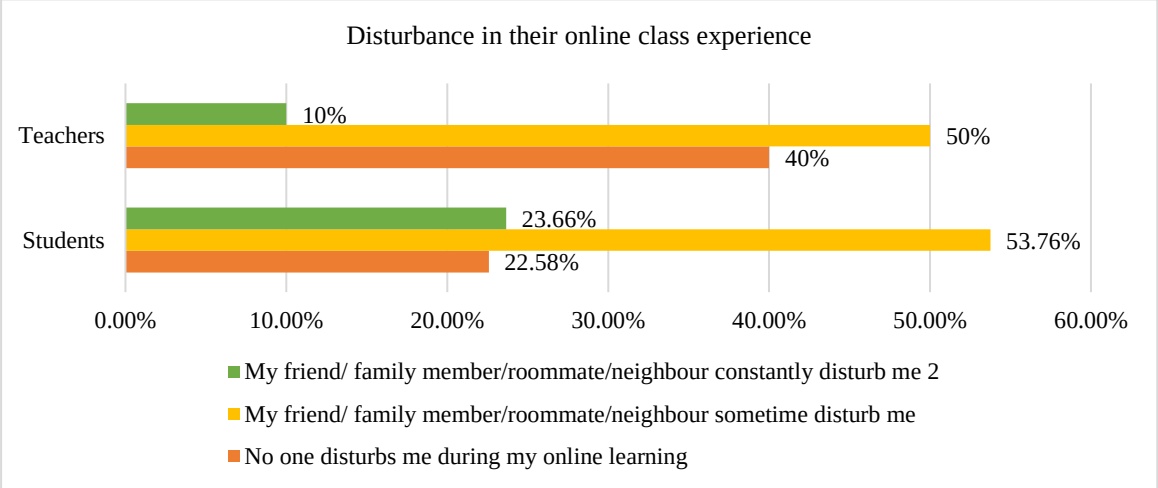


Figure 9: Disturbance in Online Class Experience

In Figure 9, the data shows that 10% of teachers and 23.66% of students reported being constantly disturbed by friends, family members, roommates, and neighbors during online classes. Additionally, 50% of teachers and 53.76% of students experienced occasional disturbances from these groups, while 40% of teachers and 22.58% of students reported no disturbances at all. Thus, we can conclude that the majority of teachers and students faced occasional disturbances from friends, family, roommates, and neighbors, likely due to household responsibilities or the forgetfulness of those around them about the ongoing online classes. Only a few reported no disturbances, indicating that their friends, family, neighbors, and roommates were particularly understanding and cooperative.

Teaching Learning Method

Teaching and learning can occur in different formats, but here it pertains to online and physical classes. Online classes involve virtual instruction using the internet, digital devices, and various collaborative and communication software. In contrast, physical classes involve attending school, sitting in a classroom with other students, and meeting teachers in person. The following figures illustrate the respondents' preferences between online and physical classes.

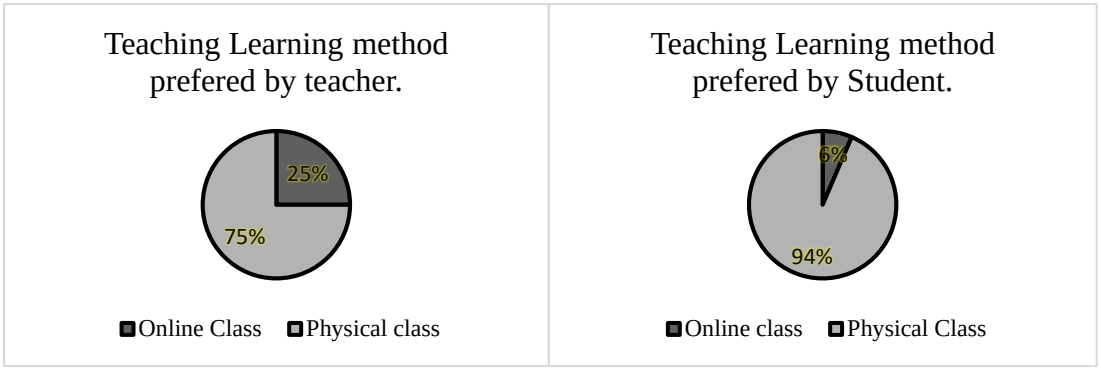


Figure 10: Teaching Learning method used in online class

In Figure 10, 75% of teachers and 94% of students preferred physical classes, while 25% of teachers and 6% of students preferred online classes.

Thus, we can conclude that the majority of teachers and students favored physical classes over online ones. This preference is likely due to the ease of face-to-face interaction, reduced distractions, and absence of household interruptions. Additionally, physical classes avoid issues related to internet connectivity, electricity, and technical problems with digital devices and software. In physical settings, students and teachers benefit from direct company and do not have to attend classes alone.

Satisfaction of online class and outcomes.

Satisfaction refers to the gratification of a student's final examinations. Here researchers categorize data into two figures. The first pie chart represents the satisfaction of student outcomes by teachers and the second pie chart represents satisfaction of outcomes by students.

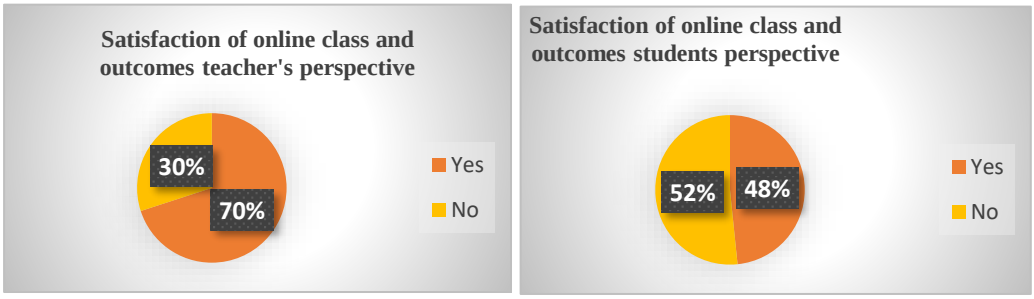


Figure 11: Satisfaction of online class and outcomes

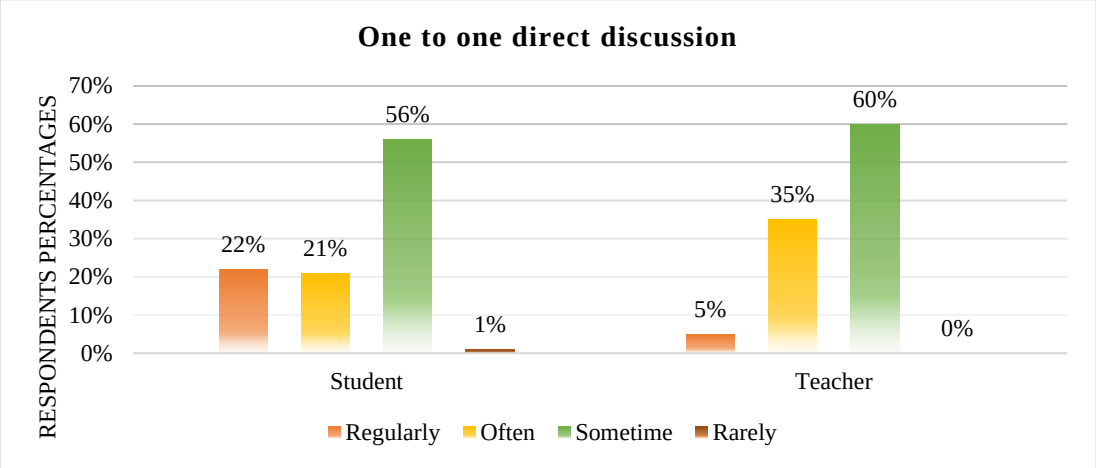
In Figure 11, 70% of teachers and 52% of students were satisfied with their online class experience and outcomes, while 30% of teachers and 48% of students were not satisfied. Thus, we can conclude that most teachers were satisfied with online classes and their students' outcomes, as there were no failing students. However, the majority of students were not satisfied with their online class experience and outcomes, believing they could have performed better if evaluated in a physical setting.

One to One direct discussion between teacher and student.

In online classes, discussion between teachers and students is very necessary. The one-to-one discussion refers to teachers having conversations with individual students during class.

Here, the researcher divided data into two categories i.e. how teachers responded to one-to-one discussions with students and how students responded to one-to-one discussions with teachers.

Figure 12: One to One direct discussion between teachers and students



In Figure 12, 22% of students and 5% of teachers reported having one-on-one discussions regularly. Additionally, 21% of students and 35% of teachers said they often had one-on-one discussions. A majority, 56% of students and 60% of teachers indicated they sometimes had one-on-one discussions, while only 1% of students reported rarely having such discussions, with no teachers indicating they rarely did. Thus, we can conclude that most teachers and students sometimes engage in one-on-one discussions during online classes. This is likely because students were often distracted by games, or web series, or opted to sleep, leading to less attention to the teacher and the online class. Consequently, it was challenging to have direct conversations, as students were not fully aware of the importance of online classes

Difficultness while using Online Teaching Learning Technology.

Difficultness while using online teaching learning Technology refers to how difficult or easy to use teaching learning technology such as computers, video audio tools, LMS software, digital devices, and other collaboration and communication tools during online classes during the COVID-19 pandemic time for teachers and students.

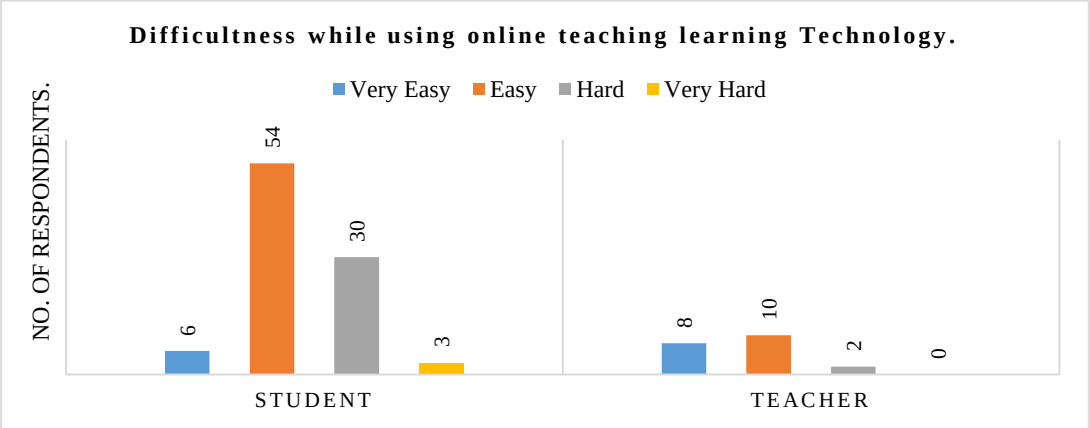


Figure 13: Difficultness while using online teaching learning technology

In Figure 13, the data shows how teachers and students found the use of teaching and learning technologies, such as computers, audio-video tools, and LMS software,

during the COVID-19 pandemic. Among the respondents, 7% (6) of students and 40% (8) of teachers found it very easy to use new technology. Additionally, 58% (54) of students and 50% (10) of teachers found it easy to use. Conversely, 32% (30) of students and 10% (2) of teachers found it hard to use new technology, and 3% (3) of students found it very hard, while no teachers reported it being very hard.

Hence, we can conclude that most teachers and students found teaching and learning tools easy to use, with only a few students finding it very hard. No teachers reported significant difficulty. This is likely because most people were already familiar with mobile phones, so integrating education with technology did not present a major challenge.

Disconnection in Online Class due to electricity/ internet/ other technical problems.

For Online classes electricity, the internet, and electronic devices are very necessary. Here, the researcher shows the disc connection in online classes for teachers in a left bar graph and the disc connection in online classes for teachers in a right bar graph. Here, regularly refers to respondents who got disconnected almost daily, often refers to respondents who got disconnected time and again, sometimes refers to occasionally rather than all the time, and rarely refers to very seldom disconnected during online classes.

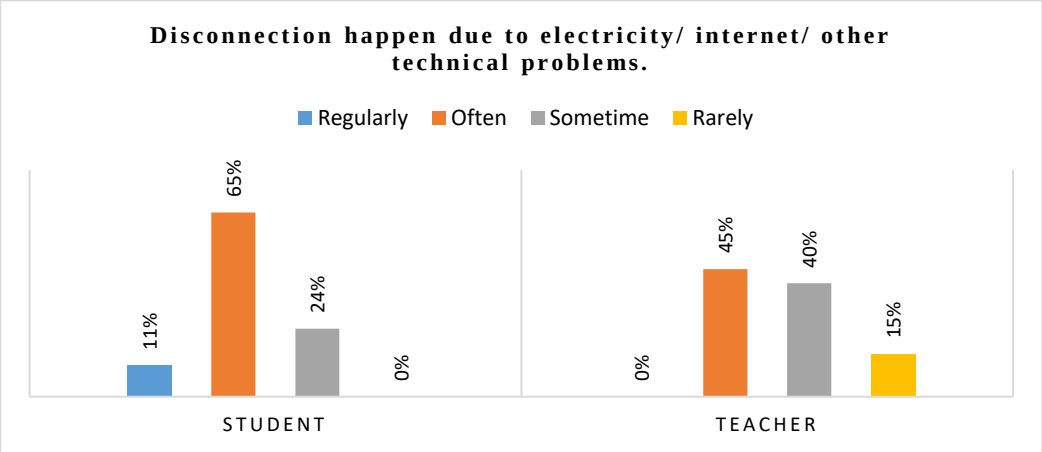


Figure 14: Disconnection in online class

In the above figure 14, the figure shows that there was 11% (6) of students and 0% of the teachers responded that they were facing disconnection problems regularly. 65% (60) of students and 45% (9) of teachers responded that they were facing disconnection problems often. 24% (23) of students and 40% (8) of teachers responded that they were facing disconnection problems some time and 0% (0) of students and 15%(3) of teachers responded that they were facing disconnection problems.

Therefore, we can conclude from the above chart the majority of the teachers and students expressed that they were facing disconnection problems often during their online classes because of power cuts, poor internet other technical problems disconnection happened more often.

Homework/project work and another assignment submission.

In online classes, students were mainly assessed through their homework, project work, and other curriculum-related assignments. To gauge students' participation and interest, the evaluation focused on their assignment submissions. In the chart, "regularly" indicates daily submissions, "often" refers to periodic submissions, "sometimes" means occasional submissions, and "rarely" signifies infrequent to no submissions.

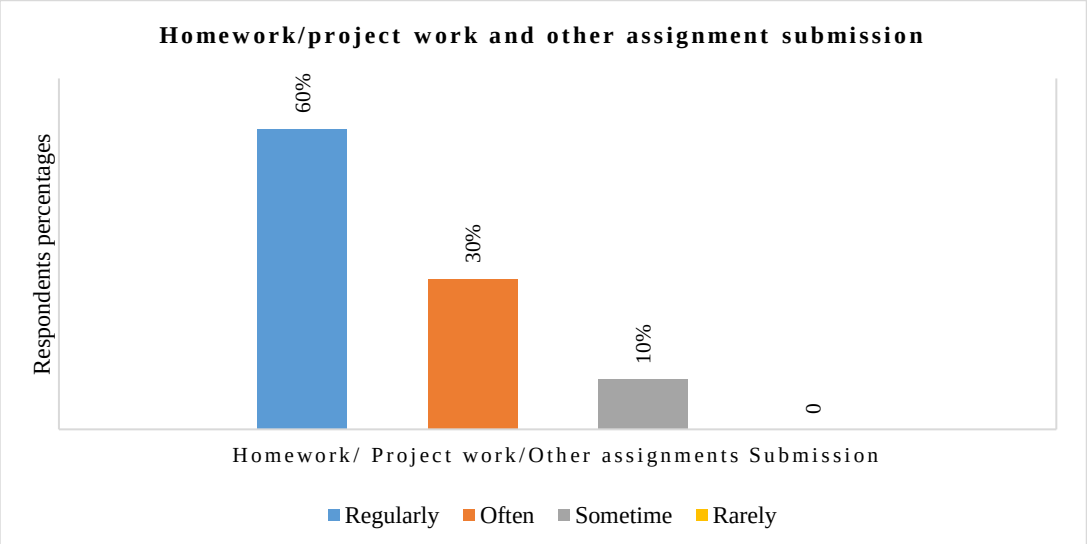


Figure 15: Student homework, project work, and other assignment submission

In Figure 15, 60% of teachers reported that their students submitted their work regularly, 30% said students submitted their work often, and 10% indicated that students submitted their work sometimes. No teachers chose the "rarely" option. Therefore, we can conclude that most students submitted their online class homework, project work, and other assignments regularly. Only a few students were negligent towards online class assignments. This is likely because every task in an online class was recorded and tracked, making students mindful of their work. Additionally, with access to mobile phones and computers, students could easily complete and submit their assignments, and some genuinely enjoyed online classes and put in their best efforts.

Analysis of Observation

The qualitative technique was employed to enhance the findings and address any gaps in the questionnaire. Observations were conducted to gain insights into student and teacher behavior during online classes, including attendance, participation in class activities, and interactions with teachers and peers. This was achieved by examining SEE examination results and reviewing recorded videos of online classes provided by school principals during the COVID-19 pandemic. Additionally, the researcher conducted live observations at one sampled school and reviewed recorded online class videos from other sampled schools. The observation data were analyzed descriptively. To illustrate the findings, let's examine the following data.

SEE Examination Result Analysis

Due to the pandemic, it was not feasible to conduct the SEE examination with all students physically present. The SEE 2077 evaluation comprised 25 percent from subject teachers and 75 percent from various terminal exams. Conducting a 100% final exam-based SEE examination was impractical because of unreliable internet and electricity. The results of the 2077 SEE examination were very good, with most students receiving A grades, some even achieving A+, and only a few getting B+ and B. This raises the possibility that the school administration may have been biased in awarding high marks, or the students genuinely performed well in the virtual exams administered by their schools. However, after reviewing the entire online class process and its outcomes, the examination results did not demonstrate reliability and validity.

Students Dropouts

While observing student attendance and reviewing recorded online class videos from various schools, the researcher found that most dropout students were from government schools, with only a few from private schools. In private schools, nearly all students were residents who didn't need to move to their villages, giving them easy access to educational facilities. Conversely, most students in government schools were from rural areas and had to return home due to the pandemic, which was the primary reason for the high dropout rate. Additional reasons included a lack of ICT tools and internet service.

Students Participations

Upon observing student performance, researchers concluded that students were very passive and rarely responded to their teachers' questions unless called by name. Sometimes, even when called by name, students did not respond. When teachers asked them to solve questions and post answers in Zoom or Veda applications, only three or four students participated. Initially, students were active, but over time their interest waned significantly.

The primary reason for this lack of participation was student disengagement. Most of the time, students had their cameras and microphones turned off, and they were distracted by games, anime, and other activities. Instead of focusing on their teachers, students were often eating, sleeping, playing games, or watching anime cartoons.

Positive and Negative effect of Online Class

Through observation, researchers identified both strengths and weaknesses in online classes. The use of ICT tools proved beneficial in facilitating an effective understanding of subjects, eliminating the need for travel or uniforms, allowing flexibility in eating and seating arrangements, and reducing noise disturbances. Teachers also had the opportunity to utilize various effective teaching ICT tools, enabling both teachers and students to learn new technologies and become digital citizens. The challenges arose due to class disconnections caused by internet and electricity issues, leading to feelings of loneliness and hindering social interactions with friends and teachers. Furthermore, lack of discipline resulted in students

engaging in activities such as sleeping, eating, playing games, and using social media during class, while insufficient student participation and response affected the learning environment. Students' easy access to mobile phones led to distractions from games and social media, fostering passive behavior among students and active teaching from teachers. Online classes also contributed to negative behaviors, such as copying work from the internet and fostering laziness among students, who have become reliant on copying assignments. Additionally, students have become addicted to their phones, even those previously unfamiliar with them, spending time playing games and watching different types of cartoons. Teachers and principals have expressed concern over these negative effects on the education system. Overall, this discussion highlights predominantly negative outcomes stemming from online classes.

Conclusion

The COVID-19 pandemic has significantly altered the landscape of education, prompting a shift towards online learning methods. This article has delved into the impact of the pandemic on school education, highlighting the challenges posed by school closures and offering insights into managing these impacts. Through a comprehensive analysis, various factors influencing the effectiveness of online learning programs have been identified, including hardware and software tools, internet connectivity, student participation, and evaluation techniques.

One of the key findings of the study is the widespread familiarity and acceptance of online teaching and learning tools among both teachers and students. Despite initial challenges, such as poor internet connectivity and limited familiarity with technology, the majority of respondents adapted quickly to online learning platforms. This adaptability underscores the resilience of educators and learners in embracing digital education solutions, the study also sheds light on several shortcomings of online education during the pandemic. While students demonstrated proficiency in using technology, their engagement and participation in online classes were found to be lacking. Many students admitted to joining classes only to switch off their cameras and engage in activities unrelated to learning, such as gaming or sleeping. This passive behavior indicates a disconnect between student motivation and the online learning environment.

Moreover, concerns were raised regarding the reliability and validity of online assessments, particularly in the context of final examinations. The ease of cheating and the absence of proper invigilation mechanisms cast doubt on the integrity of online evaluation methods. Despite favorable outcomes in terms of grades, the satisfaction levels among teachers regarding student engagement and responsiveness were notably low.

The article also uncovered various obstacles hindering the effective implementation of online classes during the pandemic. These include challenges related to internet accessibility, teacher proficiency in using learning management systems (LMS), and student distractions at home and concerns were raised about the detrimental effects of

lengthy screen time on both teachers and students, leading to physical discomfort and reduced productivity.

In light of these findings, several implications for the future of online education during emergencies like the COVID-19 pandemic have been outlined. Addressing issues related to internet access, providing adequate training for teachers in LMS usage, and implementing strategies to enhance student engagement are paramount. Furthermore, measures to mitigate distractions and promote a conducive learning environment at home should be prioritized.

References

Dhull, I. (2019, May). Online Learning. 32-34.

Zhao, L., Ao, Y., & Wang, Y. (2022). *Impact of Home-Based Learning Experience During COVID-19 on Future Intentions to Study Online: A Chinese University Perspective.* Chengdu.

Allatta, J., & Myers, P. (2023, May 13). *You Shouldn't Be the Only One Talking in Your Digital Classroom*. Retrieved from hardvard.edu: https://hbsp.harvard.edu/inspiring-minds/you-shouldnt-be-the-only-one-talking-in-your-digital-classroom

Berg, G. A., & Simonson, M. (2022). Distance Learning. In *Encyclopaedia.* Encyclopædia Britannica.

Bezovski, Z., & Poorani, S. (2016, January). The Evolution of E-Learning and New Trends. Information and Knowledge Management. 50-57.

Bhatta, P., & Gyawalli, S. (2021). Can Online Learning in Nepal Outlive the COVID-19 Pandemic? *Online Learning in Nepal*, 2.

Bluestone, Z. (2022, November 16). 7 Characteristics of a Virtual Classroom.

Bradley, V. M. (2021). *Learning Management System (LMS) Use.* United States: IJTE.

Chaudhary, G. P., & Lamichhane, A. (2022). *Impact of COVID-19 Pandemic on learning status of student in Nepal.* Wolters Kluwer Medknow Publications.

Creswell, C. (2010). *Research design: Qualitative, quantitative, and mixed methods approaches (3rd ed.).* Sage Publication.

Creswell, J. W. (2014). *Research Design (3rd ed.).* SAGE Publications.

Dawati, S., & Shimkhada, P. (2020). *Impact of COVID-19 on the Education Sector Sector: Challenges and Coping Strategies.*

Dhawan, S. (2023, April 2). *Sage Journals.* Retrieved from Sagepub.com: https://journals.sagepub.com/doi/full/10.1177/0047239520934018

Dictionary. (2023, April 2). *Boarding School*. Retrieved from Dictionary.com: https://www.merriam-webster.com/dictionary/BoardingSchool

Dictionary. (2023, April 2). *Effectiveness*. Retrieved from dictionary.com: https://www.dictionary.com/browse/effectiveness

Dictionary. (2023, April 2). *Pandemic*. Retrieved from dictionary.com: https://www.dictionary.com/

Dictionary. (2023, April 2). *Quarantine*. Retrieved from Merriam-webster.com: https://www.merriam-webster.com/dictionary/quarantine

Dictionary. (n.d.). *Online adjective*. Retrieved from Merriam webster: https://www.merriam-webster.com/dictionary/online

Digital device definition. (2023, June 13). Retrieved from Law Insider: https://www.lawinsider.com/dictionary/digital-device

Drane, C., Vernon, L., Shea, S. O., Mate, T. V., Hidth, T., & Thin, M. (2020). *The impact of 'learning at home' on the educational outcomes of vulnerable children in Australia during the COVID-19 pandemic.* School of Education – Edith Cowan University.

Forster, P., & Kahan, R. (2023, July 9). *Online Learning Tools*. Retrieved from career development advice: https://au.indeed.com/career-advice/career-development/online-learning-tools

Global, I. (2023). *Information Science & Technology*. Retrieved from Digi-global.com: https://www.igi-global.com/dictionary/using-ict-in-the-classroom-for-acquiring-digital-competences/49250

Kenned, T. D., & Edmonds, W. (2017). *Embedded Approach.* SAGE Publication.

Khadka, P. B., Basnet, B. B., Panta, R. R., Dhami, N., Kafle, K., Bishwakarma, K., & Bhatta, Y. (2021). Education system of Nepal: impacts and future perspectives of COVID-19 pandemic. *Science Direct*.

Khan, D. H., & Hasan, D. (2020). *ONLINE TEACHING-LEARNING DURING COVID-19 PANDEMIC: STUDENT'S PERSPECTIVE.* Murshidabad: TOJDEL.

Khatri , S., & Dangi, N. (2021). Online Learning during the Covid-19 Pandemic: A Web-Based Survey of Undergraduate Students of Pokhara University, Nepal. *Quest Journal of Management and Social Sciences*.

Lamichhane, R. (2021, April 6). *Making Online Education Effective*. Retrieved from The Kathmandu Post: https://kathmandupost.com/columns/2021/07/14/making-online-education-effective

Laptik, R. (2012). *DIGITAL DEVICES.* Vilnius technika.

Lathram, B. (2014, June 16). Why Connectivity Matters. Retrieved from Getting Smart: https://www.gettingsmart.com/2014/06/16/connectivity-matters

Marshall, R. (1999).

Mohammad, M. (2020). *Challenges of e-Learning during the COVID-19 Pandemic Experienced by EFL Learners.* Saudi Arabia: Taibah University.

Muilenburg, L. Y., & Berge, Z. L. (2005, may). Student Barriers to Online Learning: A Factor Analytic Study. Distance Education. pp. 29-48.

municipality, Madhyapur Thimi. (2023, July 9). *COVID-19 UPDATE*. Retrieved from Madhyapurthimi: https://www.madhyapurthimi.com/covid19

Nepal Education Cluster. (2020). *COVID-19 Education Cluster Contingency Plan.* Nepal: Nepal Goverment.

Picciano, A. G. (2017). *Theories and Frameworks for Online Education: Seeking an Integrated Model.* New York.

Rogers, L. P., Berg, G. A., Boettcher, J. V., Howard, C., Lorraine, L., & Schenk, K. D. (2009). *Distance Learning.* Encyclopaedia.

The Ministry of Education, S. a. (2020). *Guidelines for facilitating students' learning through alternative systems, 2077.* Nepal: Nepal Goverment.

The Ministry of Education, Science and Technology. (2020). *Guidelines for facilitating students' learning through alternative systems, 2077.* Nepal: Nepal Goverment.

WHO. (2021, march 4). *WHO Coronavirus (COVID-19)*. Retrieved from World Health Organization.

Worldometer. (2023, July 9). *Coronavirus cases*. Retrieved from Worldometer: https://www.worldometers.info/coronavirus/country/nepal/

Xu, H., & Ebojoh, O. (2007). *EFFECTIVENESS OF ONLINE LEARNING PROGRAM: A CASE STUDY OF A HIGHER EDUCATION INSTITUTION.* Digital commons.

Zheng, M., & Lyon, C. (2021). *Online learning during COVID-19 produced equivalent or better student course performance as compared with pre-pandemic: empirical evidence from a school-wide comparative study.* BMC Medical Education.

Zippia Team. (2022, May 6). *Example of Technical Support*. Retrieved from zippia.com: https://www.zippia.com/answers/what-are-examples-of-technical-support/