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Zoom Engagement of Pre-service Teachers during Emergency Remote Classes

Ma. Shandy Quiamco, **Shaina Mae Abocado**, **Cathy Mae Toquero**

Abstract: Emergency Remote Learning presented unplanned and unexpected educational paradigms from traditional to remote classes that occur due to the COVID-19 outbreak in various countries. Zoom platform served as an emergency solution, providing a potentially safe environment for learning. Students adjusted to the new mode of teaching and learning process since the beginning of the pandemic. This study aimed to determine the pre-service teachers' perceptions of their experiences in utilizing Zoom technology to enhance their engagement (cognitive, emotional and behavioral) during emergency remote classes. Following a cross-sectional survey design, pre-service teachers enrolled in a state university (N=242) were randomly selected into strata to answer a Likert type created questionnaire with two open-ended questions. Descriptive statistics was used for the quantitative data, while content analysis was adapted in the qualitative portion of the survey. Findings revealed that Zoom Technology is an viable tool during students' engagement in emergency remote classes. However, pre-service teachers prefer face-to-face classes than online classes with the use of video conferencing tools such as Zoom. Qualitative analysis revealed the following rewards of Zoom into three categories: collaborative student interaction, online flexibility and adaptability, and performance reliability. However, some drawbacks in utilizing Zoom included: connectivity status, complexity in features, and online health struggles. Based on the results, this study serves as a basis for instructors, pre-service teachers, course designers, and academicians to provide the most suitable online learning platforms. It is recommended that instructors create various course learning activities, such as using performance-based tasks which may include online debates or other oral communication activities to foster student engagement.

Keywords: emergency online learning, emergency remote classes, engagement, online teaching strategies; Zoom technology

Highlights

What is already known about this topic:

- Zoom is a popular platform for emergency remote learning.
- Students prefer traditional format classes than classes through Zoom platform.
- Students have mental health struggles due to perplexities in emergency remote classes.

What this paper contributes:

- Rewards and Drawbacks of Zoom based from pre-service teachers' experiences.
- Application of learning activities and online strategies via Zoom in the context of the Philippines.
- Online platforms such as Zoom can moderately supplement for performance-based activities and student engagement.
- Use of cross-sectional survey and content analysis from students' experiences of Zoom.

Implications for theory, practice and/or policy:

- Maximize use of Zoom during remote classes through interactive and collaborative activities.
- Scholarships should include internet or apps subscription allowances for university students.
- Integrate apps and other technology in the use of Zoom to engage students during synchronous sessions.

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Introduction

Schools and institutions throughout the world were obliged to transition to a remote learning paradigm to contain the spread of COVID-19 (Mc Daniel et al., 2020). Whalen (2020) stated that during the COVID-19 outbreak, institutions scrambled to transition from in-person to remote teaching within days. COVID-19 unlocked the inadequacies and fragilities of the educational system (Mañero, 2020) as institutions of higher and lower learning came across the dwindling complexities of transitioning to an online learning classroom. With the integration of digital technology, teachers worldwide are attempting to mitigate the teaching and learning process. To make education possible for students amid COVID-19, teachers and students shifted to the realms of the virtual environment. The educators used the concepts behind emergency remote education, which is a temporary solution for the education sector to cope during a global health crisis (Bozkurt & Sharma, 2020; Bozkurt et al., 2020; Hodges et al., 2020; Toquero, 2020).

However, as students went online, teachers felt intense pressure to experiment with their emergency remote curriculum while dealing with student boredom, passivity, and disengagement in online learning. Currently, there are a wide range of issues concerning teaching and learning during complex emergencies that include learning technologies, teacher capacities, assessment mechanisms, and institutional preparedness (Mishra et al., 2021). Teachers' lack the necessary professional development training in technology use to manage classes in emergency remote education that propose complexities for their remote teaching delivery (Toquero & Talidong, 2020; Winter et al., 2021). Due to classes in the technology-assisted environment, students may experience boredom and lack of interest as teachers apply lectures and other teacher-controlled methods that hamper a student-centered context. Studies (Antonucci et al., 2017; Joo & Teng, 2017) mentioned that the engagement of the learners, lack of personal communication, and lack of teacher-student interaction in the virtual classroom can represent challenges for online teachers.

The experiences of the students in these online environments matter more than the curriculum (Zhao, 2020). Consequently, the strategies of the teachers should adapt to the diverse needs, learning styles, and individual differences of the students in the virtual ecosystem. During the COVID-19 period, several educators utilized Zoom technology in their web-based training, meetings, conferences, and classes (Ramadani & Xhaferi, 2020). The utilization of Zoom to sustain educational endeavors amid the pandemic can create wonderful learning opportunities for students. Teachers need to make the students' learning meaningful through creative strategies that are engaging, interactive, and enjoyable to ameliorate the students' learning retention in the virtual learning classroom.

Many educators have chosen to hold courses using web conferencing applications such as Zoom (Lederman, 2020). Zoom is a cloud-based video conferencing service that connects people virtually – either by video, audio-only, or both, all while conducting live discussions and can record such sessions for later viewing. Zoom was used by more than half of the Fortune 500 companies in 2019, and it grew even more in 2020, with a 227 percent year-on-year increase (Tillman, 2021). Zoom is also one of the most popular software-based videoconferencing tools that are used by millions of people worldwide, whether for educating, training, communicating, socializing, and doing other things on the portals of the World Wide Web. As the pandemic hit all the economic, health, legal, and educational sectors around the world, people diverted to the use of Zoom to continue doing business and educational transactions.

Zoom is the most frequently used platform among several educators from various institutions (Ramadani & Xhaferi, 2020). However, as Kebritchi et al. (2017) pointed out, teaching and learning via the online approach presents many obstacles, ranging from student difficulties to educator concerns to content concerns. The majority of the students have experienced technical problems during online learning (Yan et al., 2021), including internet lag and confusion in setting up the learning platforms.

The literature reveals a wide gap in the scientific community concerning the use of Zoom technology. There have been very limited studies done about Zoom since the rise of its popularity for utilization as

a videoconferencing tool was heightened during this pandemic. Prior to this article, studies about Zoom showcased its potential for qualitative data collection (Archibald et al., 2019), and online teaching support (Sayem et al., 2017; Guzacheva, 2020). Hence, the use of Zoom technology for enhancing strategies in the virtual environment using the technology itself has not been explored.

Few studies postulate the potential of Zoom technology for educational purposes (Archibald et al., 2019; Buheji & Ahmed, 2020; Guzacheva, 2020). Thus, this article hopes to contribute to filling in the gap relative to the most utilized video-conferencing tool during this pandemic. In the case of the Philippines, Toquero (2020) stated that the Philippines is unprepared for the implementation of emergency remote education. Nonetheless, the researchers discovered that there are limited studies available online on pre-service teachers' perceptions of using Zoom technology to increase student involvement during emergency remote classes.

Furthermore, Zoom technology has already been widely adopted in the Philippines, but no studies exist related to this current setting. Hence, this study was conducted to investigate pre-service teachers' perceptions of using Zoom technology to engage students during emergency remote classes. The researchers focused on pre-service teachers because this group has been dominantly exposed to the utilization of Zoom to mitigate instruction and since teacher education students need to learn various pedagogies as preparation for their future careers. The researchers learned about pre-service teachers' approaches and course learning exercises during emergency remote classes.

Additionally, the researchers examined whether Zoom technology is viable for student engagement (cognitive, behavioral, and emotional) during the learning process. This study is significant because it demonstrates the rewards and drawbacks associated with utilizing Zoom technology for student engagement during emergency remote classes. The study aimed to determine the pre-service teachers' perceptions on the utilization of Zoom technology for student engagement during emergency remote learning. The research questions that guided this study are:

> **RQ1.** What level of course learning activities have pre-service teachers' experienced through Zoom?
>
> **RQ2.** What extent of teaching strategies have pre-service teachers' experienced through Zoom to engage them during their course learning?
>
> **RQ3.** What are the perceived rewards and drawbacks in the utilization of Zoom among pre-service teachers' during emergency remote classes?
>
> **RQ4.** How do the pre-service teachers engage through the use of Zoom in emergency remote classes relative to cognitive engagement, emotional engagement, and behavioral engagement?

Theoretical Background

This study is anchored on the Technology Acceptance Model (TAM) of Davis (1989). TAM is one of the most influential models of technology acceptance (Riyath et al., 2022). This model, the Technology Acceptance Model (TAM), provides a traditional view of accepting new technology from the user's perspective (Thompson, 2017). Also, this model illustrates how people accept and use new technology, and experts have differing viewpoints on its theoretical assumptions and actual usefulness (Lala, 2014).

The two primary factors of TAM that influence a person's intention to use new technology include perceived ease of use and perceived usefulness (Charness & Boot, 2016). Hence, the notion of acceptance is assumed to be similar to the students' perceived satisfaction with technology use, whether they have favorable or unfavorable attitudes towards the use of Zoom for emergency learning. Likewise, the study is anchored on the Technology Acceptance Model since the pre-service teachers assessed the usefulness of Zoom technology for their course learning activities and the extent of the teaching

strategies that they experienced through Zoom. The students' perceptions of the rewards and drawbacks of Zoom technology were described through the lens of this model.

Moreover, the research sought to determine how the Zoom platform has been viable for student engagement during their emergency remote classes. It can be assumed that their engagement has a connection with their perceived satisfaction or acceptance of the usefulness of Zoom for learning purposes. Student engagement is crucial to student learning, particularly in the online world where students can frequently feel alienated and disconnected. As a result, teachers and researchers must be able to assess student engagement. Student engagement refers to the degree of attention, curiosity, enthusiasm, optimism, and passion that students display when learning or being taught, which extends to the level of incentive they have to learn and grow in their education (Beirnstein, 2021). There are three types of engagement, which include cognitive, emotional, and behavioral engagement.

The cognitive engagement of students is critical to the learning process. In contrast, cognitive engagement displays student involvement in learning to comprehend and master challenging subjects. Learning persistence is an essential component for efficient online learning (Yu et al., 2020). In the classroom, students can interact directly, face-to-face, with their classmates and their teacher. However, in the COVID-19 era, students cannot interact face-to-face because their interactions take place online (Hidayah et al., 2021). It takes into account mental activities aimed at reflecting and executing methods, as well as a commitment to carry out the prerequisites for the comprehension of complex thoughts and train themselves in uncompromising talents to master the material and learn new things (Nocua et al., 2021).

On the other hand, emotional engagement refers to students' favorable or unfavorable sentiments toward their instructors, colleagues, academics, and the educational institution to which they belong (Yu et al., 2020). As per Ge and Ifenthaler (2017), emotional engagement includes interest, boredom, enjoyment, worry, and other affective states. Any of these elements could influence how involved pre-service teachers are in their studies during their emergency remote learning. Their sense of belonging during the pandemic is limited to online interactions through the mediation of technology.

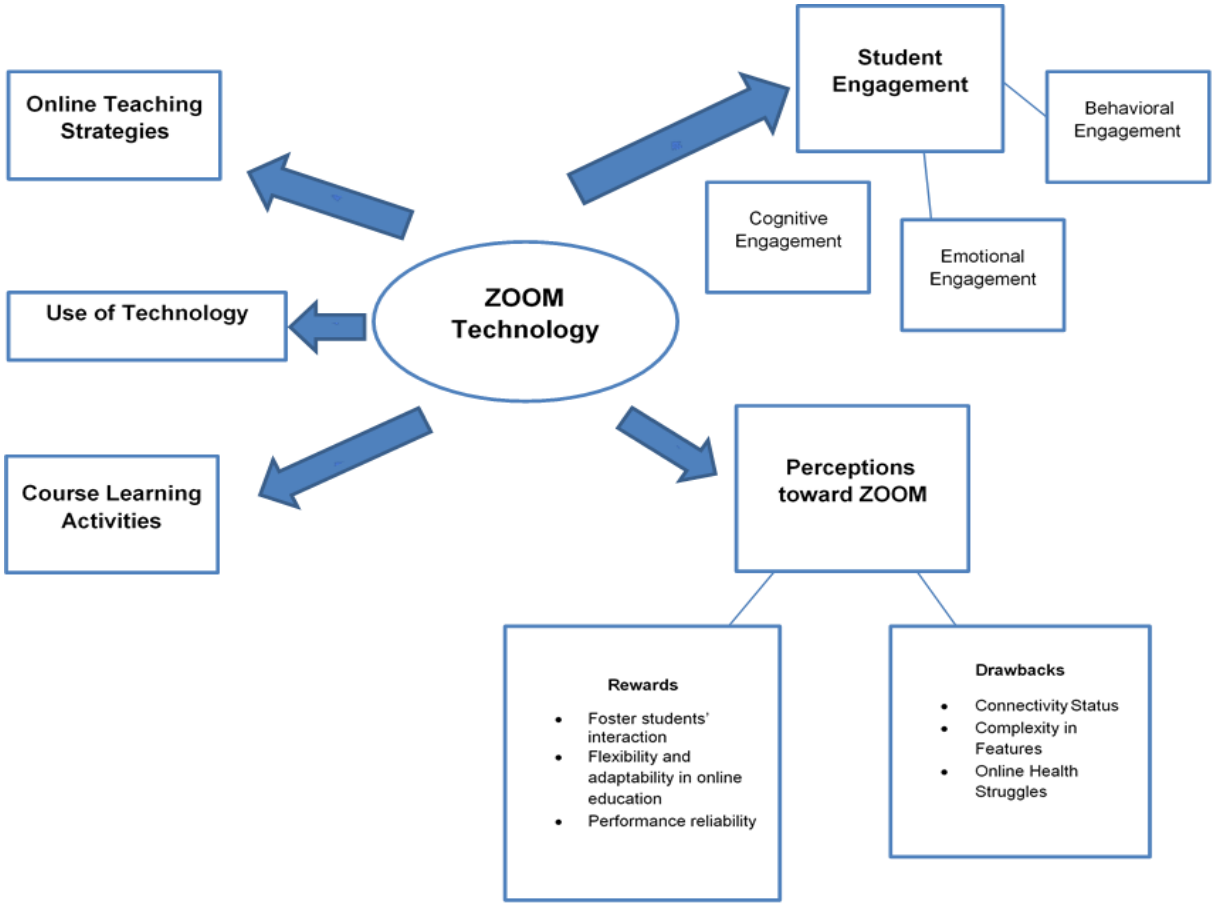
The Coalition for Psychology in Schools and Education (2020) defined behavioral engagement as on-task conduct. The behavioral engagement in the classroom is evident through norms, routines, and procedures. Teachers are challenged to make the learning process more engaging and provide activities that allow the pre-service teachers to experience the routines, rules, and procedures through online means. Selecting teaching approaches for a course's online activities must be considered to achieve the target objectives even through the use of technology such as Zoom. The employment of emerging technology as part of the teaching methods can extend students' learning while also boosting their skills and confidence.

In line with this, the conceptual framework (Figure 1) of this study focuses only on Zoom technology—the use of technology, course learning activities, and the teaching strategies. The framework shows how the pre-service teachers perceived the use of Zoom technology during emergency remote classes, which has a connection with their acceptance of the use of Zoom for learning during the pandemic. The strategies, use of Zoom, and course learning activities through Zoom have a connection with their engagement in the lessons synchronously or asynchronously, and their perception of the usefulness of Zoom technology during their emergency remote learning.

An additional variable of this study is student engagement, with three sub-variables: cognitive, emotional, and behavioral engagement. The study also examined the perceptions of the students toward the usefulness of Zoom, which is classified into rewards and drawbacks. Based on the figure, the rewards are fostering students' interaction, flexibility, and adaptability in online education, as well as performance reliability. On the other hand, the drawbacks are connectivity status, complexity in features, and online health struggles. The framework also shows the engagement and perceptions of the Bachelor

of Elementary Education (BEED) pre-service teachers of the College of Education in Mindanao State University-General Santos City.

Figure 1. Conceptual Framework of the Study



Methodology

The pandemic deterred the conduct of the study in face-to-face settings. Consequently, the researchers opted for the use of free online technologies to conduct the study within the allotted timeframe. Through an online survey and through the use of other emerging technologies, we requested the pre-service teachers for their voluntary participation in the study.

Research Model/Design

The researchers employed a cross-sectional survey design with an added qualitative data that consisted of two open-ended questions to determine the pre-service teachers' perceptions on Zoom utilization for student engagement during emergency remote classes. This research design was used to find out the connection between several different variables that were measured statistically. The researchers applied the use of written interviews which were analyzed through conceptual content analysis.

Cross-sectional survey assesses the current attitudes, opinions, practices, and beliefs of a group at a particular point in time and has the goal of comparing two or more educational groups (Creswell, 2004). The use of cross-sectional survey was suitable for this study since it aimed to determine and explore

the level of engagement among first to fourth-year levels of pre-service teachers and their perceptions, attitudes, and experiences towards the use of Zoom technology as platform for their learning during the pandemic.

Study Group

The respondents of the study involved 242 randomly selected students out of a total population of 649 first to fourth-year students from the Bachelor of Elementary Education Department (BEED) of Mindanao State University-General Santos, Philippines. The researchers used a stratified sampling technique and requested 60 respondents from 4th-year and 2nd-year pre-service teachers and 61 from 1st-year and 3rd-year pre-service teachers. The survey questionnaire was conducted through Google form surveys and distributed through a private message via Facebook and their Gmail or institutional accounts. The pandemic's social and physical restrictions hindered the researchers from conducting the survey in face-to-face settings, and since the students were in their respective locations, the researchers opted for online surveys as the only viable option at the time of the study.

The researchers focused on the said department because of the relevant knowledge we have gained through observation of the pedagogical training of the students through Zoom. And since we all came from the same department, this gives us the advantage of fully knowing the experiences of the students during their emergency remote classes. The quantitative analysis of the researchers has been bounded by this experience and first-hand knowledge, but the researchers ensured objectivity in the analysis of the results. The intended meanings of the statements of the students are also reflected in the qualitative analysis.

Table 1. Demographic Profile of the Respondents

Profile	Category	Frequency	Percentage
Year Level	1st Year	61	25%
	2nd Year	61	25%
	3rd Year	60	25%
	4th Year	60	25%
Age	Below 18 years old	0	0%
	18-20 years old	131	54%
	21-23 years old	110	46%
	24 years old and above	1	0%
Gender	Female	190	79%
	Male	48	20%
	Lesbian	0	0%
	Gay	4	2%
	Bisexual	0	0%
	Others	0	0%
Ethnicity	Cebuano	106	44%
	Ilonggo	44	18%
	Maguindanaon	26	11%
	B'laan	18	7%
	Tagalog	12	5%
	T'boli	9	4%
	Hiligaynon	7	3%
	Tagakaolo	3	1%
	Ilocano	3	1%
	Manobo	2	1%
	Maranao	2	1%
	Antiqueno	2	1%
	Others	8	3%

Data Collection Tools

The research instrument used in this study is a five-point Likert scale questionnaire which was divided into four sections. The researchers created the tool as utilized in the context of College of Education

during emergency remote classes. The first section of the instrument asked for the demographic profile. The second part assessed the perceived experiences of the students with their course learning activities delivered through Zoom. The third part of the instrument assessed the experienced pedagogical strategies of the pre-service teachers through Zoom. Lastly, the fourth section included two open-ended questions regarding the drawbacks and rewards of Zoom technology as used in emergency remote classes.

The statements on the student engagement questionnaire were adapted and modified from the study of Serhan (2020). The instrument of Serhan (2020) has the following categories: participants' attitudes toward the use of Zoom (5 items); students' perceptions of the impact of Zoom on their learning (3 items); students' perceptions of their classroom engagement (6 items); students' comparison between F2F and Zoom sessions (5 items). The modification of the said instrument was needed to categorize the statements into three types of engagement, which are cognitive, emotional, and behavioral engagement. Hence, a slight modification was made to a few statements and they were categorized according to the three stated categories to answer the research question on the use of Zoom for engagement purposes. Serhan's instrument focused on the perceptions and attitudes of the students towards Zoom, while the modified instrument focused on the perceived engagement of the pre-service towards Zoom. A few reformulations of the statements were necessary to suit the context of the study. Serhan (2020) did not discuss about the reliability and validity results.

However, the researchers of this study subjected the instruments to expert validation and pilot testing since the respondents of the study were pre-service teachers. Through Chronbach Alpha measures, the instruments of this study indicated that course learning activities obtained a reliability of 0.94; online teaching strategies obtained a reliability index of 0.90; and student engagement obtained a reliability index of 0.91. All reliability indexes are interpreted as excellent. Despite these excellent results, the instruments have limitations since rigorous validity and reliability measures were not applied. Nevertheless, the advantage of the said instruments is that they were anchored on the pedagogical and technological experiences of the pre-service teachers in the Philippines.

Research Procedures

The data collection was handled via Google form survey, as the researchers could not distribute the questionnaire physically to the target respondents due to the pandemic. A letter was requested for permission to perform the study as written to the college dean. The Likert scale questionnaire was produced by adapting and developing relevant questions from related studies.

The survey questionnaire had four sections in the google form. The Likert scale questionnaire used a five-point scale to evaluate whether respondents strongly agree or strongly disagree with the provided statements. After the validators approved the questionnaire, it was distributed to the 242 respondents who came from the Bachelor of Elementary Education (BEED) Department. The study gathered data from 1st year to 4th year pre-service teachers of the College of Education, Mindanao State University-General Santos City. The Google form survey was distributed through email or private messages on Facebook. The researchers collected the data for one month.

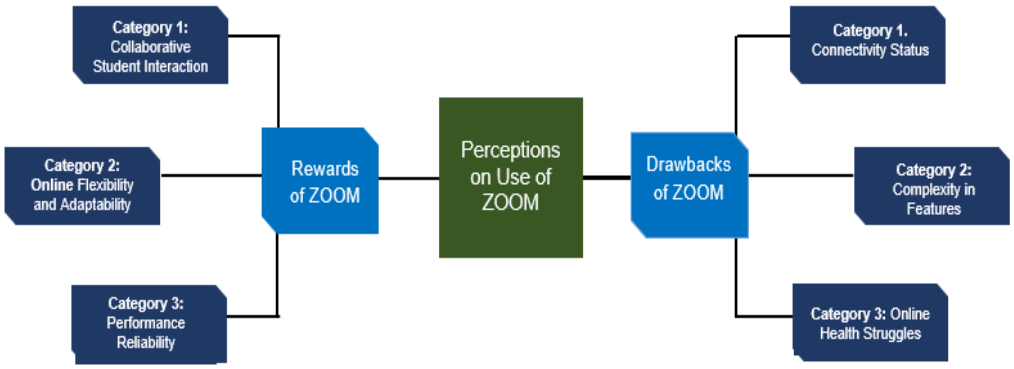
In addition, researchers obtained a signed agreement and permission letter from the Dean of the College of Education before conducting the research study to adhere to the standard procedures of conducting the study. In securing the ethical process, the researchers ensured that the information acquired was safe and appropriate for its intended purpose. The respondents' identities were kept private among the researchers to prevent intruding on their privacy. Their participation was voluntary and they were given the option to withdraw from the study anytime. Anonymity of the students' names and personal information was top priority. Their names were coded all throughout the study and only the researchers have access to their personal information.

Data Analysis

To interpret the data in the survey, the researchers applied the mean, standard deviation, frequency distribution, and percentage. We identified the level of course learning activities and assessed the teaching strategies experienced by the pre-service teachers through Zoom. The researchers also assessed the students' engagement (behavioral, emotional, and cognitive) through Zoom technology during emergency remote learning.

To analyze the transcripts of the pre-service teachers regarding the drawbacks and rewards of Zoom, the researchers used a conceptual content analysis that involves quantifying and counting its presence. Furthermore, the researchers analyzed the gathered transcripts dealing with the drawbacks and rewards of Zoom technology. They identified the codes and keywords that were formulated into three categories, with the research question as the main basis for the analysis. The frequency and percentage of the transcripts were counted and verified manually. Figure 2 depicts the summary of the categories derived from the analysis of the codes and keywords in the qualitative data. The respective data and interpretation of this figure are discussed in the qualitative section of the paper, to wit: (1) students' perceptions of the rewards of Zoom technology, and (2) students' perceptions of the drawbacks of Zoom technology.

Figure 2. Summary of Categories for the Rewards and Drawbacks of Zoom



Findings and Discussions

The researchers formulated significant statements for the questionnaires based on our observations and interactions with the students of the Bachelor of Elementary Education Department. The pre-service teachers experience various course learning activities through Zoom (Table 2). The students joined a webinar about overcoming anxieties during online classes (4.02); participated in a Zoom webinar on preparing and performing research (3.86); participated in a Zoom webinar about Media and Information Literacy (3.78); encountered oral recitation through Zoom (3.71); and took part in a group discussion through Zoom (3.71). These statements translates to an interpretation of agree. This indicates that the pre-service experienced webinars, oral recitation, and group discussion with the use of Zoom. Zoom has been widely used in the department for various curricular-related events and other course learning purposes. The students underwent several online webinar trainings to extend their learning competencies despite the complex circumstances of having to learn these competencies through emerging technologies such as Zoom.

The findings are supported by Gegenfurtner and Ebner's (2019) that webinars are associated with increased knowledge and abilities. Furthermore, webinars outperform other learning environments in terms of improving student achievement. According to Carlson and Sternberg (2017), students saw webinars as a tool that allowed them to reflect on their current knowledge while exchanging ideas and thoughts with other students.

Table 2. Zoom Technology-Related Course Learning Activities of the Pre-service Teachers

	Items	Mean	SD	Interpretatıon
1.	I experienced online debates through Zoom.	2.28	2.10	Disagree
2.	I encountered oral recitation through Zoom.	3.71	3.43	Agree
3.	I participated in a small-group discussion through Zoom.	3.84	3.5	Agree
4.	I took part in a group discussion through Zoom.	3.71	3.39	Agree
5.	I experienced reporting through Zoom.	3.45	3.24	Agree
6.	I participated in a Zoom webinar on preparing and performing research.	3.86	3.56	Agree
7.	I underwent a Zoom webinar on how to do action research.	3.53	3.27	Agree
8.	I participated in a Zoom webinar about Media and Information Literacy.	3.78	3.48	Agree
9.	I joined a webinar about Overcoming Anxieties during Online Classes	4.02	3.68	Agree
10.	I underwent a Zoom webinar about the Online Write shop on the elements of a Professional Resume.	3.37	3.15	Neutral
11.	I participated in a Zoom webinar about Scientific Writing.	3.36	3.15	Neutral
12.	I partook in a Zoom webinar about Writing a Peer Review based on the Standards of Web Science.	3.22	3.03	Neutral
13.	I joined Zoom webinars about Research writing.	3.48	3.25	Agree
14.	I participated in a Zoom webinar about the Online Write shop on the Structure of an Effective PowerPoint for Conference Presentations.	3.31	3.10	Neutral
15.	I experienced demo-teaching through Zoom.	2.58	2.51	Disagree
	Overall Mean	**3.43**	**3.19**	**Agree**

Legend: *1.00-1.80= Strongly Disagree 1.81-2.60= Disagree; 2.61-3.40= Neutral; 3.41-4.20= Agree; 4.21-5.00= Strongly Agree*

Moreover, the course learning activities of the students included a Zoom webinar about the Online Write Shop on the elements of a professional resume (3.37). they also participated in a zoom webinar about scientific writing (3.36); a Zoom webinar about writing a peer review based on the standards of Web Science (3.22); and a Zoom webinar about the online write shop on the structure of an effective PowerPoint for conference presentations (3.31). These statements have a mean score ranging from 3.22 to 3.37, which corresponds to an interpretation of neutral.

This showed that the pre-service teachers remain hopeful with regards to their experience in course learning activities, particularly in webinars about the online write shop on the elements of a professional resume, scientific writing, writing a peer review based on the standards of web science, and online write shop on the structure of an effective PowerPoint for conference presentations. According to Shin et al.'s (2022) study, webinars effectively provided just-in-time professional development for teachers worldwide, particularly in engaging students, providing feedback, developing an online presence, and creating activities specific to online learning environments.

In contrast, the students rarely experience online debates through Zoom, which obtained the lowest mean score. The students have rarely, if ever, experienced having an online debate through the use of Zoom. Debates are not used most often as a teaching strategy since it varies per course. However, the result suggests that instructors can consider applying a debate strategy to engage the students during their emergency remote classes. Nevertheless, oral communication through Zoom is a challenge during the pandemic due to the limited time for speaking activities and due to signal interruptions, among others.

Students' course learning activities obtained an overall mean score of 3.43, interpreted as agree. This implies that pre-service teachers are engaged in a high level of course learning activities using Zoom

technology. The pre-service teachers have participated in most of the course learning activities. The students have participated in webinars, oral recitation, group discussion, reporting, and small-group discussion using Zoom. Webinars through Zoom and other online platforms are some of the most popular course learning activities right now. Furthermore, the use of Zoom benefits today's learning because health crises prevent face-to-face classes. The Zoom is widely used in the current context to implement new teaching strategies and research learning because it allows students to learn research writing skills despite physical limitations. It enables students to enhance their knowledge and skills, motivates learners to learn, and makes the learning environment joyful, playful, and entertaining. Given the prevalence of online classes in the teaching and learning process, it is concluded that the use of Zoom made it possible to deliver online courses and various learning course activities and strategies to expand the learning experiences and participation of pre-service teachers. The use of Zoom has been beneficial for course learning activities through a webinar format.

Zoom offers connection among people on the web using individual smartphones, laptops, desktops, and other similar devices that can connect to the online hosts for video and audio conferencing. Zoom as a cloud-based service can make meetings and webinars possible as it can offer sharing of content and video-conferencing capability (Guzacheva, 2020). The result agrees with Toquero and Talidong (2020), that in a time of pandemic crisis where face-to-face contact is prohibited and social movements are restricted, in-service webinar training can serve as a bridge in facilitating their virtual teaching experience in preparation for their emergency remote teaching. This shows that webinar training provides new opportunities for instructors to engage students in emergency remote classes.

Participating in webinars via Zoom allows learners to improve their skills and knowledge anytime and anywhere. While schools remain temporarily closed and educators remain at home, continuous professional learning in this pandemic crisis necessitates adaptation and alternatives (Alvarez & Corcuera, 2021). Thus, the use of webinars through online platforms ensures lifelong learning for professional educators while also assisting them in adapting to the new normal in education.

Moreover, the survey result (Table 3) shows the pre-service teachers' experiences with the online teaching strategies through Zoom technology. The instructors used students' presentations (4.54); allowed the students to work in groups and help each other discuss, analyze, and solve problems (4.52); encouraged active and collaborative interaction (4.49); used objective presentations (4.43); and provided content in multiple formats such as PowerPoint presentations and Canva (4.50).

These statements have obtained a mean score ranging from 4.40 to 4.54, which translates to an interpretation of strongly agree. This indicates that the pre-service teachers have experienced students' presentations via Zoom. They also worked in groups and helped each other discuss, analyze, and solve problems; they also encouraged active and collaborative interaction. As a strategy, their instructors use objective presentations and give extra points to the students for their active participation or oral recitations during synchronous sessions.

These findings matched those of Sugeng and Suryani (2018), who found that using a presentation-based method allowed students to be more actively involved in their learning. As a result of this, students' free-ride learning behavior was eliminated. It also allowed students to practice self-regulated learning to become more independent learners and boosted their confidence in speaking and participating in class discussions. Furthermore, the findings support Suliman's (2022) assertion that oral presentations can improve students' comprehension and learning skills by allowing them to interact with one another in the classroom, which develops their personality, critical thinking, and ability to work independently in planning items for a class presentation.

Table 3. Pre-service Teachers' Experiences on the Teaching Strategies through Zoom

	Items	Mean	SD	Interpretation
1.	My instructor provides relevant guidelines on using online tools before starting online lectures.	4.12	3.70	Agree
2.	My instructor allows students' presentations.	4.54	4.07	Strongly Agree
3.	My instructor uses objective presentations.	4.43	3.97	Strongly Agree
4.	My instructor uses games and stimulation in combination with online lecturing.	4.15	3.75	Agree
5.	My instructor provides recorded video lessons that can be played anytime.	4.36	3.91	Strongly Agree
6.	My instructor gives extra points to the students for their active participation or oral recitations.	4.40	3.96	Strongly Agree
7.	My instructor provides written comments on homework assignments.	4.13	3.70	Agree
8.	My instructor uses online course projects (storytelling, reflective learning, video-driven story etc.).	4.19	3.75	Agree
9.	My instructor allows the students to work in groups and help each other discuss, analyze, and solve problems.	4.52	4.05	Strongly Agree
10.	My instructor uses open-ended questions during discussions.	4.39	3.92	Strongly Agree
11.	My instructor uses motivational stories during discussions.	4.21	3.77	Strongly Agree
12.	My instructor uses graphic organizers during discussions.	4.28	3.83	Strongly Agree
13.	My instructor uses experiential learning.	4.19	3.75	Agree
14.	My instructor provides content in multiple formats such as PowerPoint presentations and Canva.	4.5	4.04	Strongly Agree
15.	My instructor provides instructional design courses where students are expected to create a complete training module.	4.15	3.73	Agree
16.	My instructor provides small-group discussions during synchronous sessions.	4.19	3.76	Agree
17.	My instructors use virtual field trips and videos through websites that take the students to places of interest relevant to the course.	3.72	3.34	Agree
18.	My instructor encourages active and collaborative interaction.	4.49	4.02	Strongly Agree
19.	My instructor gives or disseminates the module in advance before discussing it in the class.	4.35	3.89	Strongly Agree
20.	My instructor uses flipped classrooms during online classes.	3.72	3.33	Agree
	Overall Mean	**4.25**	**3.81**	**Strongly Agree**

Legend: *1.00-1.80= Strongly Disagree 1.81-2.60= Disagree; 2.61-3.40= Neutral; 3.41-4.20= Agree; 4.21-5.00= Strongly Agree*

Moreover, the students' experience that their instructors use flipped classrooms during online classes (3.72); used virtual field trips and videos through websites that take the students to places of interest relevant to the course (3.72); *and* provided relevant guidelines on using online tools before starting online lectures (4.12). These statements have gained a mean score ranging from 3.72 to 4.12, which corresponds to an interpretation of "agree. It shows that the students have experienced the flipped classroom during online classes, virtual field trips, and videos through websites that take the students to places of interest relevant to the course, and the instructor provides relevant guidelines on using online tools before starting online lectures. In accordance with Tang et al. (2020), students' learning seemed to improve when online courses were combined with the flipped classroom. Moreover, CPS Manufacturing Co (2020) stated that students have more group work or student collaboration time to cover subject activities, discussions, and peer reviewing. Student learning can be self-paced to help them learn at their own pace and in their own time. This can be particularly effective for slower learners.

The strategies in online teaching that the students experience through Zoom obtained an overall mean of 4.25, described as strongly agree. This implies that the students experienced the strategies in online teaching via Zoom to a very great extent. Most of the instructors' teaching strategies have been

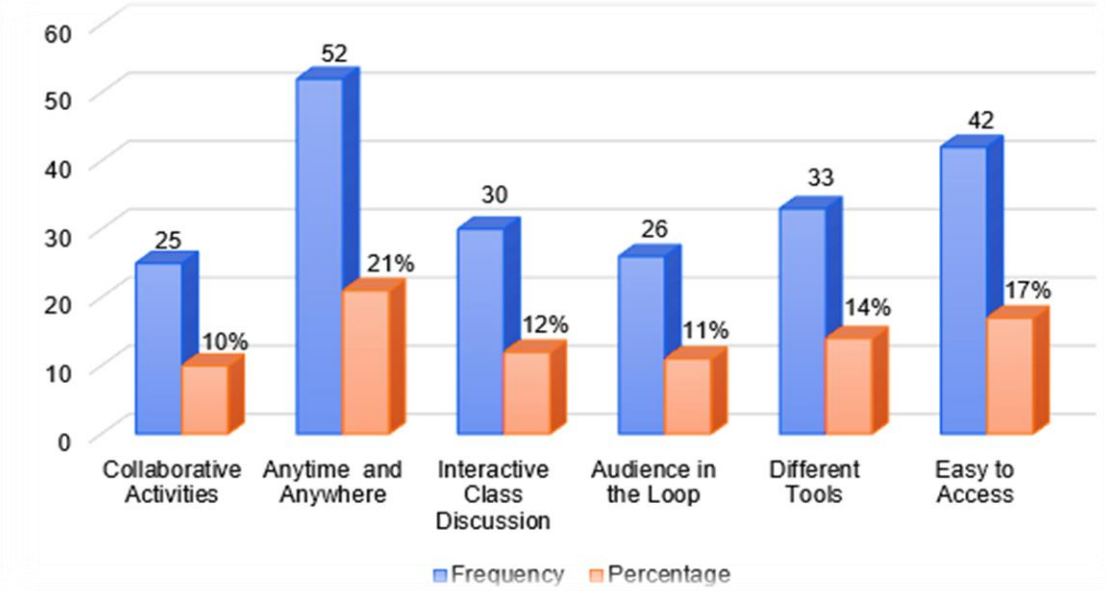
experienced by the pre-service teachers, such as using students' presentations; working in groups and helping each other discuss, analyze, and solve problems; encouraging active and collaborative interaction; using objective presentations and giving extra points to the students for their active participation or oral recitations. The stratifies also include flipped classrooms during online classes; virtual field trips and videos through websites that take the students to places of interest relevant to the course; and relevant guidelines on using online tools before starting online lectures through the use of Zoom. Using these teaching strategies, students can become more involved in online classes' teaching and learning processes. Despite the pandemic, it helps them stay motivated to learn more. Because online health struggles are experienced mainly by the students, having unique and effective teaching strategies would allow them to learn more conveniently.

The students' presentations in Zoom are effective for participating in a synchronous class. Bennette (2019) stated that using student presentations to present content to the class can be a fun and engaging method of instruction. Presentation-based learning activities are regarded as the primary method for improving students' active learning processes. This method allows students to develop, organize, and present ideas and materials on a specific topic, as Tumurkhuyag (2021) claims. Furthermore, the data from this study supports the conclusion that the instructors' strategies used during online teaching effectively engage students in course learning activities using Zoom technology.

Students' Perceptions of the Rewards of Zoom Technology

Based on the perceptions of the pre-service teachers, Figure 3 shows the results regarding the rewards of Zoom technology. The figure shows the codes from the transcripts of the pre-service teachers. Three categories resulted from the content analysis of the perceptions of the students about the strengths of the use of Zoom: collaborative student interaction, online flexibility and adaptability, and performance reliability.

Figure 3. Codes of Students' Responses on the Rewards of Zoom Technology



Category 1: Collaborative Student Interaction

The first category, with regards to the advantages of Zoom, is that it fosters student interaction. Students' attention, curiosity, interest, and passion during class are referred to as student interaction. Since the

commencement of the COVID-19 pandemic, the sudden change in knowledge acquisition has been a challenge for the students. Despite the ongoing pandemic, the school system finds various ways to provide instruction. One method is to use an online class that allows collaborative activities. Moreover, the data resulted in a frequency of twenty-nine (29) and a percentage of twelve (12%); the responses are as follows:

> *"I think the advantages of using Zoom is that it allows teachers and students interaction. It is also a helpful tool to engage students in a virtual environment to acquire learning despite of not having a traditional face to face class. In fact, using Zoom is very helpful for both teachers and students only if everyone has a good internet connection." (S#196)*

> *"Using Zoom application allows students or users to easily communicate with each other in a form of online meeting specially for the students who are learning online during this pandemic." (S#161)*

In line with this, the instructors effectively utilize Zoom technology that allows the students to participate and interact. Zoom helps the teachers to have collaborative activities which are conducted during the online classes.

> *"It helps the teachers to have collaborative activities to enhance the learnings that their students might gain. And also, students will be able to share their thoughts with their group mates for the betterment of their output." (S#16)*

> *"the advantage of using Zoom is that it allows teachers and students interaction. It is also a helpful tool to engage students in a virtual environment to acquire learning despite not having a traditional face-to-face class. Using Zoom is very helpful for both teachers and students only if everyone has a good internet connection"* (S# 4)

In delivering lessons, teacher-student interaction is a big factor in learning. Hence, the sudden shift in education affected their learning, which caused a big adjustment for both the teachers and students. The use of Zoom technology is an alternative way to deliver lessons online. Online teaching did not hinder student and teacher interaction; the students interacted with their teachers online, which allowed the students to engage themselves during online classes. Referring to Bawani and Arifani (2021), the Zoom application can also improve communication between teachers and students because it has access to do video conferencing anywhere and anytime. Organizations that have already entered the Fortune 500 includes Zoom application that is believed to be of high quality in supporting the learning process throughout the COVID-19 Pandemic (Menggo, 2021).

Category 2: Online Flexibility and Adaptability

The second category of advantages of Zoom is its flexibility and adaptability in online environments. Emergency Online Learning is a new method of delivering classes to students. Teachers were shown how to use a new educational tool online. Both teachers and students have gradually adopted Zoom technology, which is also flexible in many ways, such as it can be used anytime and anywhere, fosters collaborative activities, and promotes interactive class discussions. Teachers and students have benefited from Zoom technology since it is the tool to deliver lessons "anytime and anywhere," resulting in students' answering frequency of 52, or 21% of pre-service teachers perceiving this flexibility of Zoom. The following responses demonstrate the ease with which Zoom technology can be used:

> *"You can use it anytime and anywhere as long you have internet connection. You can travel while listening to class." (S#232)*

> *"It can be used as online platform in new normal education. With Zoom you can still attend class asynchronously. Moreover, it can accommodate 100 + participants compare to google meet." (S#69)*

> *"It is convenient tool nowadays because we are in pandemic. Zoom is useful in virtual class where students can connect with teachers." (S#223)*

Furthermore, the adaptability of using Zoom technology allowed "interactive class discussions," as the survey resulted in a frequency of thirty (30) and a percentage of twelve (12%). The data below shows the responses of how Zoom technology become an advantage to have interactive class discussions:

> *"It promotes interactive class discussions through its features like raise a hand, chat, and screen sharing. It's also free to install unlike other apps which need payment." (S#215)*

> *"The breakout rooms that students can use especially during group activities which help them easily communicate with their group members. You can also see the faces of your classmates even when you're using mobile phone." (S#23)*

> *"It was an advantage to people who has low self-confidence because they can type-in their answers in the public chat without unmuting their selves." (S#30)*

Zoom technology is an educational tool that is used in online education. The rewards of utilizing this technology are the flexibility and adaptability that enable the students to use and manipulate the technology. Using this technology allows students to use it anytime and anywhere. One of the advantages is that "*It is a convenient tool nowadays because we are in a pandemic. Zoom is useful in virtual classes where students can connect with teachers.*" This statement is supported by the study of Rahmat (2021), stating that one of the advantages of Zoom is that it is flexible and offers students the accessibility of teaching materials and the lesson anytime, anywhere, and in any way. It provides the students with the freedom to determine how they want to study. In line with this, one of the advantages includes the students' interactive class discussions, which are also considered an essential factor for the student's learning process. Having an interactive class during meetings impacts the students' knowledge, especially during these trying times. Online teaching is the only mode of learning used by pre-service teachers. Also, one of the students said that "*It promotes interactive class discussions through its features like raising a hand, chatting, and screen sharing. It's also free to install, unlike other apps which need payment."*

Aside from this statement, students with low self-esteem were also encouraged to participate in an interactive class. The information says: *"It was an advantage to people who have low self-confidence because they can type in their answers in the public chat without unmuting themselves."* This statement follows Rahmat (2021); when it is related to daily activities for speaking, 71% of students prefer using online learning platforms. He concluded that the students need extra time to think of what to say before they perform in front of them, their lecturers and friends. The study of Bawanti and Arifani (2021) shows that the Zoom application helps students develop their independent study skills and motivates them to learn.

Category 3: Performance Reliability

Based on the students' answers, the last category of Zoom's rewards is its performance reliability. According to the students, Zoom supports a large audience, you can use various tools to participate in class, and it is simple to use. Communication is essential in education, and having high-quality technology features will make it easier for teachers to deliver lessons. The Zoom technology features allowed the online class discussions to be more engaging and smoother. Moreover, Zoom technology can be a reliable tool in online education that improves and also allows students to perform an academic

task. The performance reliability included "audience in the loop" with a frequency of 26 or 11% of students mentioned. The following responses below summarize the similar answers:

> *"Supports Large Audiences one of the advantage is the ability to host very large online conferences." (S#48)*

> *"A large number of people can get in and it doesn't load or lag as much as in Google meet." (S#145)*

Moreover, the performance of the students in using Zoom technology also relies on the different tools which resulted in a frequency of thirty-three (33) and a percentage of fourteen (14). The following responses summarize the similar answers:

> *"You can use different tools like pencil to participate in class." (S#12)*

> *"It has lot of tools and of course it can help us in our online class as one of our medium." (S#43)*

> *"It has a lot features like, private messaging, emojis and easier recording a conference." (S#99)*

Lastly, the performance reliability of the students including "easy to access" resulted in a frequency of forty-two (42) and a percentage of seventeen (17%). The following responses summarize the similar answers:

> *"It was a huge help when it comes to online sessions, easy to access, flexible, and has a wide range to gather more people during meetings." (S#121)*

> *"It can be used easily, there were no other complex things to do before accessing to it." (S#64)*

> *"Easy to access, Makes teaching & learning process more attainable amidst pandemic times, great tool for communication & interaction, great tool for presenting lessons." (S#192)*

Features of one's technology affect the students' engagement and interaction during class discussions. Hence, the features of Zoom technology in terms of communication are an advantage that is perceived by the pre-service teachers. One of the features is the "audience in the loop". As it caters to more than a hundred participants, it supports large audiences as one of the rewards since it can host very large online conferences. Zoom has the capability of hosting 100 participants at a time, including audio and video. The platform is designed so that it works well even with limited bandwidth. Guzacheva (2020) mentioned that Zoom has become an indispensable technology for the way people work, teach, and learn together.

Furthermore, another performance of Zoom technology is very helpful for the pre-service teachers as they stated that it has a lot of features like private messaging, emojis, and easier recording of a conference. One of the students added that *"It has a lot of tools and, of course, it can help us in our online class as one of our mediums".* The performance of Zoom technology builds the interest of the students to participate and engage themselves during online discussions, which is consistent with the study of Hazairin (2020). Even with almost similar features, the observation shows that Zoom is considered to be more helpful in the teaching learning process.

In line with the identified features, "easy access" is also the reward of using Zoom technology. This allows the students to easily manipulate and explore the tool in education since everyone and anyone can easily access the tool and there is learning interaction during classes. The students claimed that it is easy to access and makes the teaching and learning process more attainable amidst pandemic times. They stated that it is also a great tool for communication and interaction, as well as a great tool for

presenting lessons. The study by Kim (2020) concluded that learners are satisfied with using Zoom video lectures for the following reasons: increased interest in and motivation towards learning; self-directed learning; active interaction; ease of access; ease of information retrieval.

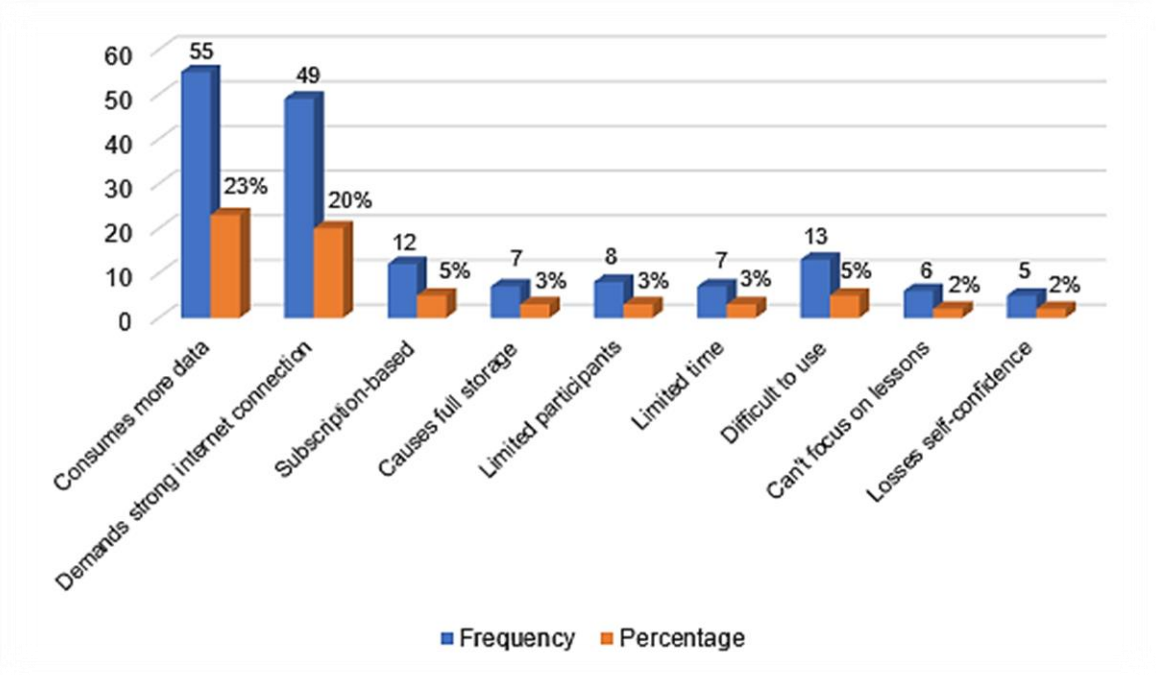
To conclude, the rewards of Zoom technology have been categorized as follows: increased student involvement, flexibility and adaptability in online education, and performance reliability that makes teaching and learning viable throughout the COVID-19 pandemic. Despite the pandemic, Zoom permits interaction and facilitates learning between students and teachers. Students can also learn at anytime and anywhere using this online tool. Additionally, Zoom provides a number of features that enable students to study and interact in their online classes. As a result, pre-service teachers recognized that Zoom technology is an effective tool that enables them to participate in and learn from various online course activities and online teaching strategies encountered via Zoom technology.

According to Guzacheva (2020), Zoom technology's innovative approach improves positive learning outcomes for diverse groups of students while also encouraging higher education in remote areas and potentially reducing teacher workloads. In addition, Zoom technology is an excellent collaboration tool. Furthermore, Suardi (2020) stated that the use of Zoom is effective because prospective teachers can learn a new skill in teaching as well as new knowledge in using each android productively. As a result, it is possible to conclude that using the Zoom Cloud Meetings application is very effective in the learning process and has positively affected the learning process.

Students' Perceptions of the Drawbacks of Zoom Technology

Students answered about their perceptions regarding the drawbacks of Zoom (Figure 4). Their statements reflect their experience on course learning via Zoom. The researchers scrutinized their written statements to formulate keywords and codes. We reviewed these codes, identified similarities, and eventually assigned them into categories. The answers are based on groups of codes that are similar. The figure is presented by the following categories based from the transcripts of the pre-service teachers with regards to the drawbacks of Zoom.

Figure 4. Codes of Students' Response on the Drawbacks of Zoom Technology



Category 1. Connectivity Status

The first theme concerning Zoom's disadvantages is its connectivity status. One of the most common problems encountered by remote learning students is unstable internet access. Because most students only use mobile data, they have had issues with their internet connection. Typical technical difficulties include insufficient Internet bandwidth. Zoom technology cannot be used without the presence of an internet connection. However, not all students can afford to have a WIFI plan, so they are using cellular data networks. As perceived by the pre-service teachers, one of the disadvantages of Zoom technology when it comes to connectivity is that it consumes more data, with a frequency of fifty-five (55) and a percentage of 23%.

> *"Based on my answers above, the main big disadvantage of this online platform is that it consumes more cellular data than the "others" since most of us are only using cellular data". (S# 25)*

> *"It is consuming greater amount of MB unlike any other applications. Some students are using mobile data and using Zoom consumes a greater amount of data that is considered a struggle to other students". (S# 124)*

> *"Based on my experience, the Zoom app requires a big amount of data that's why some of the student refused to use Zoom as the main tool in conducting synchronous class". (S180)*

According to the pre-service teachers, Zoom technology requires a strong internet connection. The internet in the Philippines is not as strong as the connections in other countries (Toquero et al., 2021), so students clamor of the intermittent connections. Likewise, some of the students of this study are located in remote areas. Furthermore, when compared to other online platforms, Zoom technology requires a strong and stable internet connection to function properly, which is costly for pre-service teachers.

> *"As a student living in far flung area, I really have a hard time in using Zoom in our classes. It requires strong signal that is why sometimes I cannot attend to my classes even though I want to. But there are times when I am able to enter in the Zoom meeting, yet I have difficulties in understanding the flow of the lesson because it automatically dismissed or lag due to my slow internet connection. Also, one of my problems as a data user is that Zoom consumes much data. I always spend money buying load for data just to attend my classes". (S#195)*

> *"The disadvantages of Zoom are primarily the internet connectivity since it is an online platform. Considering that not everyone has a stable connection to constantly be connected in the meeting. Moreover, it is costly since it needs data or WIFI connection to function. Knowing some of the students are not financially stable to afford this matter". (S# 29)*

> *"The disadvantages of Zoom are it requires a strong and stable internet connection rather than the other application just like Google Meet". (S # 6)*

One of the most common problems students encounter during emergency remote learning is an inability to connect to the internet. Because of financial constraints, most students cannot afford a WIFI plan capable of supporting their online learning through the use of various platforms, particularly Zoom Technology, considering that some instructors use Zoom in their synchronous classes. Even though some pre-service teachers have a WIFI plan, they still experience network issues when accessing the internet, such as connection breaks and inconsistent speed, all of which impact the students' learning process. As a result, the researchers concluded that one of the main disadvantages of Zoom technology is its reliance on a stable internet connection and that it consumes a lot of data

when using cellular networks. In line with this, one of the pre-service teachers perceived one of the drawbacks of Zoom as *"It demands a strong internet connection and it consumes more MB for those who are using mobile data."*

This finding corroborates with the study of Alibudbud (2021), where unstable internet connectivity is one of the main difficulties of remote learning. Students, particularly those in remote areas, cannot attend their online sessions and have difficulty understanding their lessons due to an unstable internet connection, which causes Zoom to encounter technical problems.

In the findings of Suadi et al. (2021), most students agreed that internet bandwidth is the main problem in using Zoom. It is really because their campus is located in a remote area, which makes it difficult to succeed in implementing online learning. They mentioned that the internet connection was terrible and that they had limited internet data due to low economic class conditions. Those problems caused Zoom to be ineffective, and the students could not listen well to the lecturers. The difficulties in internet connection sometimes lead to unproductive and delayed learning.

Aside from that, some of them are opposed to using this platform as the primary tool for conducting online sessions because it requires a high and consistent bandwidth speed. Furthermore, compared to other online platforms, Zoom technology needs a solid and stable internet connection to work correctly, which is expensive for pre-service teachers.

Category 2: Complexity in Features

Another category that repeatedly appears in pre-service teachers' responses to Zoom's drawbacks is the complexity of its features. Most students have reported technical difficulties with using Zoom technology during their online classes, such as consuming phone storage, and some students have difficulty using it. Furthermore, if it is not premium, it restricts who can enter and sets a time limit for usage. There are 12 students, or 5%, who stated that Zoom technology is a subscription-based application which means that they cannot access all its features unless they opt for a premium account, which they cannot afford in an individual capacity due to financial constraints. Moreover, Zoom is required to download and causes full storage in phones as the pre-service teachers.

> *"Zoom is a subscription-based service that is reasonably priced at starter levels". (S# 47)*

> *"With its handful feature, the app is not made for everyone because most of its features are premium so it requires any user to pay a substantial amount of money to be able to maximize its potential". (S# 66)*

> *"One of my bad experienced in using Zoom is when I'm with my private class, the Zoom we are using is not premium so our class is not continuous so we need to rejoin again after we disconnect unlike to any other conferences applications its free and convenient". (S# 15)*

> *"Zoom is required to download the app and might cause full storage capacity of the phone considering it has a huge file size. Also, Zoom is a subscription-based service and matters on multiple tiers based on the number of attendees, thus is obliged to subscribe first to meet the expected participants, however, the high price can make it difficult". (S# 242)*

> *"It's heavy to the phone storage honestly. During webinars, I am only watching Facebook live". (S# 185)*

> *"I can't really tell because as what I've said, in our class we usually use GMEET but as per experienced, in Zoom it only caters a hundred of participants and I think that's the disadvantage of using Zoom". (S# 69)*

Besides that, according to the pre-service teachers, Zoom technology has only limited participants and can only cater a hundred of them if it is not a premium account. In addition, pre-service teachers answered that Zoom has also a limitation in time so it requires the user to pay to use it for more than an hour. Also, some of the students prefer to use Google Meet rather than Zoom.

> *"I prefer Google Meet than Zoom it has limited time and it consumes bigger GB for data users also I don't like it's quality and the persons to get in are limited". (S# 142)*

> *"There's a time limit for the meeting and sometimes you won't notice that your microphone is on". (S# 33)*

> *"Zoom requires payment for you to access certain settings such as being able to use it for more than an hour. If you are an unpaid user like me, you are only given 40 minutes to use it". (S# 40)*

Lastly, some of the pre-service teachers expressed their thoughts about the complexity of the utilization of Zoom. They said that Zoom technology is difficult to use and hard to learn, especially for those who are not experts in using technology. Others students claimed that Zoom technology is not class-friendly because they find it hard to manage.

> *"Zoom has a lot of special features, because of this, people will be perplexed and it will be difficult to use for those who are not tech-savvy. They will have to learn all of the buttons and functions, but after they have mastered the app, it will be very convenient to use". (S# 178)*

> *"The disadvantage of Zoom is the way of using this as I come to inter a meet and I don't know to use the symbols or sign in the Zoom. At the same time, the Zoom platform is not usually usable in the online meet. Only the Google meeting is certainly the best for me". (S# 120)*

> *"We usually don't use Zoom but for me I am having a hard-time to familiarize it". (S# 131)*

Zoom Technology is an online platform that offers meetings, webinars, content sharing, and video conferencing. The communication technology features allow the pre-service teachers to interact with their instructors. However, there are also issues regarding features, and it is one of the drawbacks of Zoom technology. Following the pre-service teachers' statements, the Zoom application is not made for everyone since it is a subscription-based application where the user needs to pay to access all the Zoom features. In line with this, some of the pre-service teachers experience problems. Their online class is not continuous, so they need to rejoin again since their Zoom is not premium. They perceive "*if the network is terrible, the meeting would end up being glitchy or not be understandable by the viewers."* This agrees with Gray et al.'s (2020) study, stating that the disadvantages to consider when using any video conferencing platform are extra costs and possible technical difficulties. Similarly, as Rahman (2020) reported, poor internet connectivity, lack of compatible devices, and expensive data plans are some of the challenges students face during online learning.

Another drawback of the Zoom application in its features is that it is limited in terms of participants and time if it is not a premium subscription. If the user is not a premium member, the Zoom can only accommodate 100 participants. Correspondingly, there is a time limit for the meeting; if one is an unpaid user, one is limited to using Zoom within 40 minutes. According to the study of Tsarapkina (2020), the disadvantage of Zoom is the duration of the free conference which is only 40 minutes. Similarly, Zoom Technology needs to be downloaded on phones, which causes whole storage. Pre-service teachers believe that Zoom requires more storage space, which can lead to unexpected app and internet connection failures.

Furthermore, pre-service teachers remarked that the features in Zoom are difficult to use. Since not all students use Zoom as their platform in their online classes, some of the pre-service teachers are having a hard time familiarizing with the different features of the Zoom application. Given the fact that not all students are good when it comes to using technology, they find it difficult to familiarize themselves with the functions of a platform as beginners. According to Tsarapkina (2020), a user needs extra time to learn all the features and subtleties of using the app.

Category 3: Online Health Struggles

Most of the pre-service teachers experienced online health struggles, which is the third category of the drawbacks of Zoom. The online health struggles experienced by pre-service teachers include not being able to focus on their learning, feeling shy during their online class, and losing self-confidence. They stated that they cannot focus on their learning because it is conducted online and they have experienced emergency remote classes for two years. They remarked that learning through technology is not easy. Furthermore, according to the pre-service teachers, using Zoom technology is hard for those students who are reserved shy because they feel more shy in the online classes and make them unresponsive.

> *"I can't focus on the focus especially if connection is unstable and something on SNS got my attention". (S# 9)*

> *"It is hard for us students who are reserved type to participate because we feel more shy here than face to face classes and this makes us more unresponsive". (S# 100)*

> *"It [Zoom] made me lose my self-confidence and my interest in learning." (S# 204)*

Students' learning processes have changed dramatically as a result of online education. Researchers discovered that using Zoom technology has a negative impact on pre-service teachers' mental health. This result is in consonance to the so-called Zoom fatigue (Nadler, 2020; Sklar, 2020). Some pre-service teachers are experiencing mental struggles due to the demands of remote learning. Since online classes have a complex learning environment at home, pre-service teachers frequently lose focus during their online sessions due to various issues, such as internet connectivity. Based on Rahmat and Fachrunnisa's (2021) study, most of the participants in their research complain that the network is not good, especially in rural areas. Moreover, due to the weak internet connection, students may not be able to pay attention to the lesson. The teaching and learning parts became ineffective because of the challenges faced by the students. Pre-service teachers, particularly those who have an introverted personality, struggle with how they interact during their online sessions. Loss of confidence and interest in learning can impact students' academic performance and other aspects of their lives. The pre-service teacher said they became more nervous about talking in the class. According to Belgica et al. (2020), teachers' and parents' concerns are students' lack of motivation and participation in online courses. Because there is no face-to-face interaction, more and more students are losing interest in taking online classes.

Furthermore, some pre-service teachers are embarrassed during their online courses, and as a result, they become unresponsive. As per Astuti (2021), the students experienced a lack of interest from other students during an online classroom activity. Further, Williams (2021) states that using a video platform is generally more psychologically demanding than face-to-face contact, including a greater need to concentrate and the new experience of the proximity of facial images and sometimes a bank of faces. In addition, it has been reported that individuals have a reduced ability to interpret body language and cues, difficulty detecting humor and irony, and difficulty relaxing into a natural conversation.

The pre-service teachers had difficulty using Zoom during the learning process. According to their opinions, Zoom Technology has a problem with connectivity status, features' intricacy, and online health issues. Most pre-service teachers reported that the Zoom technology consumes more data, hindering

their learning. In addition, it is a subscription-based program for which students must pay to access most of its features. Pre-service instructors have also reported that using Zoom has a detrimental impact on their learning process due to online health issues. This result is corroborated by Serhan (2020), who indicated that certain Zoom application users had technical and unanticipated challenges when utilizing the new platform, such as internet access problems and Zoom bombings. Moreover, according to Archibald's (2020) study, the majority of participants in their research had some difficulty joining the session. Low Internet bandwidth, obsolete technology, and limited webcam and microphone functionality were typical technical issues.

Moreover, the survey questionnaire elicited responses regarding pre-service teachers' engagement through Zoom technology use. It was classified into three types of engagement: cognitive, behavioral, and emotional. Table 4 summarizes the results of a study on how pre-service teachers engage in Zoom during emergency remote classes.

Table 4. Student Engagement towards the use of Zoom Technology

*Statements	Mean	SD	Interpretation
Cognitive Engagement			
1. The use of Zoom improved my learning in the class.	3.58	3.18	Agree
2. The use of Zoom helped me in learning the class content.	3.70	3.30	Agree
3. The use of Zoom helped me in developing confidence in the subject.	3.45	3.05	Agree
4. The use of Zoom helped me participate in the class in ways that enhanced my learning.	3.52	3.12	Agree
5. The use of Zoom motivated me to participate actively in various class activities.	3.51	3.12	Agree
6. The use of Zoom made it easier for me to be more engaged in the class discussions.	3.51	3.13	Agree
Emotional Engagement			
7. I enjoyed using Zoom during the class.	3.56	3.18	Agree
8. I felt comfortable using Zoom in the class.	3.50	3.13	Agree
9. I would like to use Zoom in other classes.	3.37	3.04	Agree
10. I feel confident with my learning experience/s using Zoom in the class.	3.47	3.09	Agree
11. Overall, I enjoyed using Zoom in the class.	3.55	3.18	Agree
Behavioral Engagement			
12. The use of Zoom increased my interaction with my instructor.	3.50	3.13	Agree
13. The use of Zoom increased my interaction with my classmates.	3.54	3.16	Agree
14. The use of Zoom motivated me to seek help from tutors, classmates, and the instructor.	3.42	3.03	Agree
15. The use of Zoom in online sessions made me learn the class content more than the ones in the face-to-face traditional class meetings.	2.97	2.68	Neutral
16. I participated more in the Zoom sessions in comparison to the traditional face-to-face class meetings.	2.76	2.46	Neutral
17. My attention to the class tasks during the Zoom sessions was greater in comparison to the traditional face-to-face class meetings.	2.69	2.42	Neutral
18. It was easier to participate in group activities in the Zoom sessions in comparison to the traditional face-to-face class meetings.	2.58	2.34	Disagree
19. I would do better in the class if it was taught in the traditional face-to-face class format without using Zoom.	3.95	3.58	Agree
Overall Mean	**3.38**	**3.02**	**Neutral**

Legend: *1.00-1.80= Strongly Disagree 1.81-2.60= Disagree; 2.61-3.40= Neutral; 3.41-4.20= Agree; 4.21-5.00= Strongly Agree*

The students enjoyed using Zoom during class (3.56), and they enjoyed using Zoom overall (3.55). The pre-service teachers agree that they enjoyed utilizing Zoom technology during their online class. These

findings corroborate Sayem et al.'s (2017) analysis, in which students reported an interest in adopting Zoom as an interactive tool to accomplish course objectives efficiently. As a result of their findings, Sayem et al. (2017) found that Zoom technology had a beneficial effect on the learning process.

However, the pre-service teachers are undecided about whether to incorporate Zoom into their classrooms. Serhan (2020) backs up this finding by stating that students were dissatisfied with their learning experiences during this transition period because many factors have contributed to their learning process. The instructors were unprepared for this abrupt change, which necessitated the use of a new platform as well as the development of alternate activities and delivery methods. While using the new platform, some users encountered technical and unexpected difficulties, such as internet access issues and Zoom bombings. Added to that, the issue of equity and access

Moreover, results about the pre-service teachers' perception of the use of Zoom relative to their cognitive engagement show that the use of Zoom improved students' learning in the class, and helped students learn the class content. The perceived ease of use of Zoom also assisted pre-service teachers in developing subject confidence. This finding was supported by Kim (2020), who found that Zoom video lectures boosted learners' interest and excitement for learning and assisted in the development of self-directed learning. Additionally, as Kim stated, Zoom was intriguing because it represented an innovative way of learning. Thus, the researchers found that using Zoom in online classes helps students acquire class content such as assigned readings, video recordings, quizzes, and other learning resources.

Zoom encourages pre-service teachers to improve their confidence in their subject because it is an advantage for those with low self-confidence. Without unmuting themselves, they can type their responses in the public chat, one of the Zoom's features. Thus, according to Astuti (2021), 41.9% of students admit to being more confident when speaking online than when speaking in person. The reasons include the increased time allotted for thought and the absence of eye contact, which helps them avoid feeling intimidated. It enables individuals to talk freely without fear of their classmates reacting negatively to their speaking ability.

With regards to the results of pre-service teachers' behavioral engagement, the use of Zoom increased the students' interaction with their classmates. However, they believed that they would do better in class if it was taught in the traditional face-to-face format without using Zoom. This indicates that the pre-service teachers prefer and believe that they can perform better in the traditional class format. They stated that it is not easy to participate in group activities using Zoom technology.

Overall results show that the pre-service teachers' engagement relative to emotional, cognitive, and behavioral measures has obtained a mean score of 3.38, described as neutral. This implies that the students have a moderate level of engagement towards the use of Zoom. The pre-service teachers can use Zoom during emergency remote classes, and they express favorable opinions on the use of Zoom in online sessions to learn the class content. They actively participated in the Zoom sessions, and they believed that their attention to the class tasks during the Zoom sessions was greater than in the face-to-face traditional class meetings. However, they find it challenging to participate in the group activities in the Zoom sessions. They also believed that they would do better in the class if it was taught in the traditional face-to-face format without using Zoom. Thus, students still prefer face-to-face classes rather than online classes using video-conferencing tools such as Zoom. The Technology Acceptance Model partly supports this result since students concur with the usefulness of Zoom technology during emergency remote classes. Zoom has made it easier to learn lessons during emergency remote classes and has facilitated their cognitive and emotional engagement. Despite this positive feedback on the perceived usefulness of Zoom, students would prefer to do academic tasks in conventional classroom settings.

This result agrees with Serhan's (2020) conclusion, which indicated that students favored traditional FTF classroom instruction compared to the Zoom sessions. Also, according to Makarova (2021), 28.9%

of the participants in his study answered that they preferred traditional learning and teaching. Furthermore, the findings are consistent with Spencer and Temple's (2021) findings that students performed better in and preferred traditional face-to-face formats.

Conclusion and Suggestions

COVID-19 presents a tremendous challenge to the emergency e-learning ecosystems of the education sector. However, the innovative approach of the teachers through Zoom technology can increase the participation of the students and retention of their lessons in emergency online education amid the pandemic. The teachers can maximize the features of Zoom for accessibility to all the learners as it offers promising potential to fulfill the learning needs of the students in a time of global crisis. The purpose of this study was to examine the pre-service teachers' experiences and perceptions of the utilization of Zoom technology during emergency remote classes. Their engagement during emergency remote classes was also identified through cognitive, emotional, and behavioral engagement. Different student perceptions about the rewards and drawbacks were also determined using open-ended questions. The following are the conclusions of the study:

1. The pre-service teachers have a high level of course learning activities through the utilization of Zoom. They experienced various course learning activities to expand their emergency response skills through Zoom. The Zoom webinar was the most practical way to engage them in remote learning while also allowing for some form of authentic assessment.

2. Pre-service teachers have encountered diverse online teaching strategies to engage them during their course learning activities through Zoom. The pre-service teachers have experienced presentations, stories, and apps integrated through Zoom to engage them during their course learning.

3. Zoom utilization in emergency remote classes presents rewards and drawbacks. The rewards revealed three categories: collaborative student interaction, online flexibility and adaptability, and performance reliability. Zoom's drawbacks include its lack of connectivity, feature complexity, and online mental health issues.

4. The pre-service teachers are moderately engaged cognitively, emotionally, and behaviorally during their emergency through Zoom. Zoom has emotionally aided pre-service teachers' confidence and interaction, and it has aided their cognitive engagement in class content. However, pre-service teachers prefer face-to-face classes over Zoom classes when it comes to their behavioral engagement since their motivation for learning is reinforced in the traditional format.

Institutions and organizations worldwide have gained the rewards of Zoom videoconferencing as they are able to use this platform for diverse purposes. Through Zoom technology, teachers can utilize the strategies in this article to complement their pedagogical instruction and create an interactive, engaging, and fun class. The teachers should create various course learning activities, such as using performance-based tasks and authentic assessments. This may include online debates or other oral communication activities to foster student engagement. Teachers may employ the pedagogy of care and a trauma-informed pedagogy to support students in dealing with the psychological issues during emergency remote learning (Bozkurt et al., 2022).

In addition, university officials should develop programs and train the faculty through workshops and seminars focusing on the strategies used in online teaching, including mental health strategies to foster students' engagement during emergency remote classes. In collaboration with the Commission on Higher Education and information and communications technology providers, higher education

institutions should obtain adequate support for internet connectivity and build accessible WIFI areas for students to reduce their purchasing load expenses. Course designers and implementers can integrate the use of Zoom and its best features as part of pedagogical and technological app interventions to improve practice. Scholarships can be considered, including internet or app subscription allowances for the students. Future researchers should examine the use of other existing online technology platforms as an intervention to improve students' engagement and motivation during emergency remote classes. Researchers can also employ Zoom as a means for gathering data through online communication with the research participants. Likewise, limited research exists on the use of Zoom for educational purposes, so researchers can investigate the experiences of teachers and learners in utilizing Zoom technology for their emergency remote education or emergency e-learning.

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Conflict of Interest

The authors do not declare any conflict of interest.

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