Continuity of Learning Through TBM: Technology-Based Modalities During and After Pandemic

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Abstract
The COVID-19 pandemic is definitely a health issue that has affected much of the sectors in the community. As a city, Santa Rosa has never been hindered by the present challenges brought by the COVID-19 pandemic, different calamities, and problems that need to be addressed appropriately. This investigated the learners' perspectives on their current capacity and its implications for learning continuity through technology-based modalities. These were investigated based on the availability of gadgets, internet connectivity, and their classroom learning experiences. As per select schools, out of the 28 public schools, select nearby senior high schools was the research locale. This study employed the convergent parallel design, which entails that the researcher concurrently conducted the quantitative and qualitative elements in the same phase of the research process, weighed the methods equally, analyzed the two components independently, and interpreted the results together. This study concluded that respondents favor modular distant learning. Most respondents who have difficulties in meeting the requirements were because of ICT limitations. Even though the majority of them have benefited from the assistance of their families and the local government, some of them are still having issues on their online capacity based on the indicated parameters. The emerging themes from the experiences and difficulties of learning amidst the pandemic were: Technology in Education; The Role and Function of Technology; Technology-based Learning Environment and Assessment; and Safety and Security. This study resulted with a proposed strategic plan - PAU, that can ensure the effective implementation of different learning modalities.

Keywords: Continuity of Learning, Technology-Based Modalities, Strategic Plan

Introduction

The COVID-19 pandemic is unquestionably a health issue that has impacted many community sectors, particularly the school sector. The epidemic has impacted Santa Rosa as a city. All families have experienced the significant disruption, which has had a negative impact on the city's educational system as a whole. The problem highlights the conflict between keeping schools open during their regularly scheduled hours as required by law while both decreasing interaction and saving lives.

Thus, the educational system was forced to act quickly to adapt to the evolving nature of learning, and schools must respond to the massive disruption caused by COVID-19. In Santa Rosa City, different schools and institutions are being urged to create a resilient learning system utilizing data that is both evidence- and need-based so that proactive and responsive measures may be put in place.

As a continuing commitment, SDO Santa Rosa City has never been hindered by the present challenges brought by the COVID-19 pandemic, different calamities, and problems that need to be addressed appropriately. As mentioned by Martin Luther King, "The function of education is to teach one to think intensively and to think critically. Intelligence plus character – that is the goal of true education," which necessitates the division to work more productively and make everyone responsible for quality education that every learner deserves. Hence, education has never stopped during and after the pandemic.

The manner in which instruction and learning take place changes in crisis situations. When crises and calamities occur (man-made and natural) occur, educational institutions must be adaptable and discover new approaches to carry on the learning and teaching processes (Chang-Richards et al., 2019). One new reality brought upon by the world is the move to online learning platforms which is a response to the health problem to reduce the danger of in-person communication.

The new realities of our world, which place a strong emphasis on social isolation for health and safety, eventually call for changes to the ways that schools educate and learn. In order to support and equip schools and learning centers in creating a conducive learning environment and in complying with the quality criteria set in this new normal time, the Division of Santa Rosa City pledges to strengthening our mandate in this regard.

In this regard, the researcher aimed to investigate the issues and challenges in technology-based learning modality in the select schools of Santa Rosa City during and after the pandemic for the development of strategic actions for learning continuity.

Aim of the Study

This study aimed to investigate the issues and challenges in teaching and learning amid the pandemic through the eyes of faculty members and students as the foundation for the development of strategic actions for teaching and learning continuity.

This study specifically sought to answer the following questions:

1. What is the profile of the learners/students in terms of:
   1.1 Preferred flexible learning modalities;
   1.2 Problems in the completion of requirements due to ICT Limitation;
   1.3 Provision of additional/alternative requirements;
   1.4 Receiving of learning feedback; and
   1.5 Learning atmosphere/environment?

2. What is the profile of faculty and students in terms of online capacity as categorized into:
   2.1 Access to e-gadgets;
   2.2 Access to Internet connectivity/Wi-fi connection; and
   2.3 Stability of Wifi/internet connection?

3. What emerging themes from the experiences and challenges of teaching and learning amidst the pandemic can be developed?

4. From the salient findings of this research, what Strategic Plan for teaching and learning can be proposed?

Method

Context, Participants, and Procedures

This study used a convergent parallel design, which required the researcher to conduct both the quantitative and qualitative components at the same time, weigh the approaches equally, separately analyze the two components, then combine their interpretations of the findings (Creswell & Clark, 2011). A thorough study of the research problem was also offered by the convergent parallel design by merging or combining quantitative and qualitative data.

The use of both quantitative and qualitative methods was simultaneous. To determine the difficulties in teaching and learning, a structured online survey utilizing Google forms was conducted. Respondents had options to pick from in the Google form.

Quantitative Population/Sampling Procedure

In the quantitative section of the investigation, simple random sampling was used. A total of 288 students from the listed senior high schools were chosen at random to make up the study's population. The number of respondents per school division is shown in the Table 1.

Distribution of Respondents Per School

School	**Learners**
School A	95
School B	95
School C	98
Total	**288**

Qualitative Population/Sampling Procedure

In order to respond to study question number three, which examined learners' challenges and experiences, the qualitative method was adopted. The researcher was able to record the experiences and difficulties of the respondents by reading the narratives they provided in

response to the open-ended questions they were asked online. Themes that gave a clear description of the experiences and difficulties were used to examine the narratives.

Data Analysis

The validated and reliable-tested final instrument was converted to online Google Form. The converted instrument was sent through E-mail and Messenger of Social Networking Sites (SNS).

Since the survey was conducted online, retrieval of the data was through cloud computing using the researcher's Google Drive account, wherein it was automatically stored. Data Privacy form and Informed Consent form were given to both respondents for the signature, acknowledging their participation in the whole research process. Lastly, data analysis, interpretation, and thematic analysis were performed accordingly.

Quantitative Part

Data were analyzed to provide a clear picture of the setting and experiences of learners after obtaining the quantitative and qualitative findings. The information was utilized to create a scenario, analyze it, and then use the findings to decide on the strategic activities for teaching and learning continuity. Scenario analysis is a method for predicting outcomes under the premise that a phenomenon would continue in the future (Kishita et al., 2016).

This strategy is helpful for investigating likely future events that might or might not occur (Bekessy and Selinske, 2017). With the help of this method, which creates a theoretical scenario of the best-case (optimistic) or worst-case (pessimistic) scenario for behavior in response to an unexpected event like the pandemic, the researcher was able to develop a comprehensive strategic plan for the continuity of teaching and learning (Balaman, 2019).

Qualitative Part

In order to respond to study question three, which examines the difficulties and experiences of the learners, the qualitative method was adopted. Online open-ended questions were utilized to gather the respondents' narrative responses so they could talk about their struggles and experiences. It provided a detailed account of the experiences and challenges; the tales were then assessed thematically. The researcher then created hypothetical scenarios that served as the foundation for adaptable strategic actions that the schools could take depending on the community quarantine classification and the local health situation where the schools are located. This was done after the researcher analyzed quantitative and qualitative data.

Results

This study was conducted in select nearby senior high schools. These were used by the researcher to compare the continuity of teaching and learning in the Division of Santa Rosa City during and after the pandemic. The conduct of this study in these research locales were pursued since it will greatly help the SDO Santa Rosa City track the status and adherence of schools to the relevant policies of the said department. Moreover, it helped them determine the continuity of learning can be adapted by other divisions or nearby schools to ensure the effective continuity of education during and after the pandemic situation.

The researcher made use of both descriptive and inferential statistics in analyzing the data collected from the respondents.

1. The Profile of the Learners in Terms of:

1.1. Preferred flexible learning modalities;
1.2. Problems in the completion of requirements due to ICT Limitation;
1.3. Provision of additional/alternative requirements;
1.4. Receiving of learning feedback; and
1.5. Learning atmosphere/environment.

Table 1: Profile of learners in terms of Preferred flexible learning modalities

Learning Modalities	Frequency	Percentage
Modular Distance Learning	111	35.54
Online Distance Learning	86	29.86
TV/Radio-Based Instruction	0	0
Blended Learning	71	24.65
Homeschooling	20	6.94
Total	288	100

Table 1 shows that most of the respondents prefer Modular Distance Learning (35.54%) which can be inferred that most of them have been exposed to this modality since they had undergone modular distance modality for the past two (2) years due to the pandemic. This is also true since they have been provided with the modules that they use as their learning materials, both printed and digitized modules. They were fortunately provided by the Local Government as a way of continuing education in the city. The digitized modules were stored in the On-The-Go (OTG) flash drives and then transferred to their mobile devices. Consequently, it was followed by Online Distance Learning with 29.86% of the total responses; Blended Learning with 24.65%; and 6.94% for Homeschooling. It can also be seen that none of the participants chose TV/Radio-Based Instruction because it is not available in their communities.

Table 2: Profile of learners in terms of completion of requirements due to ICT Limitation

Statements	**WM**	**VI**
E-gadgets are too costly or expensive	3.54	Strongly Agree
Demands too much time be spent on technical problems	3.25	Agree
Effective only when extensive computer resources are available	3.57	Strongly Agree
Limits my choices of instructional materials	2.63	Agree
Requires software-skills training that is too time consuming	2.51	Disagree
Composite Mean	**3.10**	**Agree**

4 - 3.25-4.00 (Strongly Agree); 3 - 2.5-3.24 (Agree); 2 - 1.75-2.49 (Disagree); 1 - 1-1.74 (Strongly Disagree)

In Table 2, Profile of the learners in terms of completion of requirements due to ICT Limitation, it is observed that most of the respondents or 3.57 strongly agree that it can only be effective when extensive computer resources are available. It was followed by the indicator that e-gadgets are too expensive with 3.54 as weighted mean, wherein most of them strongly agree that they are being limited with the completion of their requirements due to expensive gadgets that they need. It is also observed that they agreed on the two other

indicators that it demands too much time be spent on technical problems, and limits their choices of instructional materials. On the other hand, they disagreed that it requires software-skills training that is too time consuming, which means that they can easily adapt to the ICT environment. The composite weighted mean of 3.10 shows that they agreed on the ICT limitations that they encounter in completing their requirements.

Table 3: Profile of learners in terms of additional/alternative requirements

Statements	WM	VI
Requires extra time to complete the learning activities	3.51	Strongly Agree
Makes classroom interaction becomes easier	3.37	Strongly Agree
Helps accommodate students' personal learning styles	3.16	Agree
Motivates students to get more involved in learning activities	3.29	Agree
Results in students neglecting important traditional learning resources (e.g., library books).	3.42	Strongly Agree
Composite Mean	**3.35**	**Strongly Agree**

4 - 3.25-4.00 (Strongly Agree); 3 - 2.5-3.24 (Agree); 2 - 1.75-2.49 (Disagree); 1 - 1-1.74 (Strongly Disagree)

In this table, it can be gleaned that most of them strongly agreed in the stated indicators. Among them, Indicator 1 with 3.51 weighted mean showed that they are required to spend extra time to complete learning activities. It was followed by the idea that students neglect important traditional learning resources with 3.42 weighted mean; and classroom interaction becomes easier (3.37). These indicators manifest that the respondents are aware of the pros and cons that they encounter when they are given additional or alternative requirements using the technology. Additionally, they concurred with the claims that ICT supports students' individual learning styles (3.16) and motivates them to participate more actively in educational activities (3.29). The composite mean of 3.35 means that they strongly agreed that the experiences they have with the additional/alternative requirements using ICT are taken into consideration.

Table 4: Profile of learners in terms of receiving of learning feedback

Statements	WM	VI
Improves student learning of critical concepts and ideas	3.54	Strongly Agree
Eases the pressure on the learners	3.28	Agree
Is successful only if technical staff regularly maintains computers	3.43	Strongly Agree
Is successful only if there is the support of parents	2.76	Agree
Will increase the amount of stress and anxiety students experience	2.91	Agree
Composite Mean	**3.18**	**Agree**

4 - 3.25-4.00 (Strongly Agree); 3 - 2.5-3.24 (Agree); 2 - 1.75-2.49 (Disagree); 1 - 1-1.74 (Strongly Disagree)

The indicator for improving student understanding of important concepts and ideas received the highest weighted mean (3.54), as shown in Table 4, while the belief that learning

feedback can only be successful if the technical staff regularly maintains the computers or e-gadgets that they use received a weighted mean of 3.43. This demonstrates that the respondents concur that learning feedback must be properly given with the assistance of specialists. As a result, the majority of them agreed on the following three additional indicators: Reduces pressure on students (3.28); Will raise the amount of stress and anxiety students suffer (2.91); and Is only successful with parental support (2.76). It manifests that feedback mechanism in the technology-based learning modality is crucial for them and must be done with proper guidance and technical skills. Its composite mean of 3.18 also shows that most of them agree in all the indicated parameters when receiving of learning feedback is concerned.

Table 5: Profile of learners in terms of learning atmosphere/environment

Statements	**WM**	**VI**
Is only successful if computer technology is part of the students' home environment.	3.36	Strongly Agree
Is a valuable instructional tool	3.31	Agree
Is successful only if there is the support of parents	3.37	Strongly Agree
Is difficult because some students know more about computers than many parents do	3.42	Strongly Agree
Is only successful if traditional approaches are part of the students' environment.	3.25	Agree
Composite Mean	**3.34**	**Strongly Agree**

4 - 3.25-4.00 (Strongly Agree); 3 - 2.5-3.24 (Agree); 2 - 1.75-2.49 (Disagree); 1 - 1-1.74 (Strongly Disagree)

The majority of respondents, as shown in the table, strongly concur with the following statements: is difficult because some students are more computer literate than many parents (3.42); is only successful with parental support (3.37); and is only successful if computer technology is available in the students' homes (3.36). This determines their stance on the ICT learning environment for technology-based modality for the continuity of education during and after the pandemic. They believe that the enumerated considerations must be taken into account when ICT is applied in the learning atmosphere. If the e-gadgets and equipment are not available at home, it will not be successful, especially during online classes. Technical divide can also hinder their learning when parents do not seem to understand their needs in ICT gadgets and learning materials. Their parents must give the full support to the demands of technology. However, some parents do not have the capacity and the skills to support the learners and provide for all its demands.

Technovation has been identified by the Division to be its foremost goal through its banner program B2B-SRC (Be Efficient, Be Empowered, Be Excellent in Santa Rosa) by ensuring the provision of e-learning gadgets and equipment to the learners. Technological innovation has been the trend in this new normal learning environment to which LGUs and external stakeholders give their utmost support to all the needs and demands of the educational system (Mangubos, 2021). This makes the City becomes a good venue in providing technology-based learning environment for its learners.

2. The Profile of Learners in Terms of Online Capacity as Categorized Into:

2.1 Access to e-gadgets;
2.2 Access to Internet connectivity/Wi-fi connection; and
2.3 Stability of Wifi/internet connection?

Figure 1: Profile of the learners in terms of online capacity as categorized into access to e-gadgets

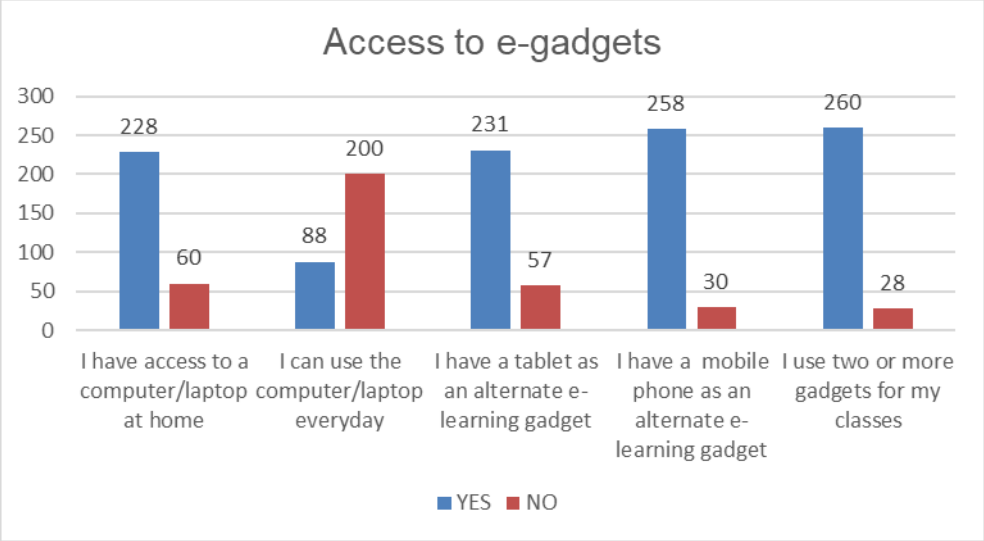
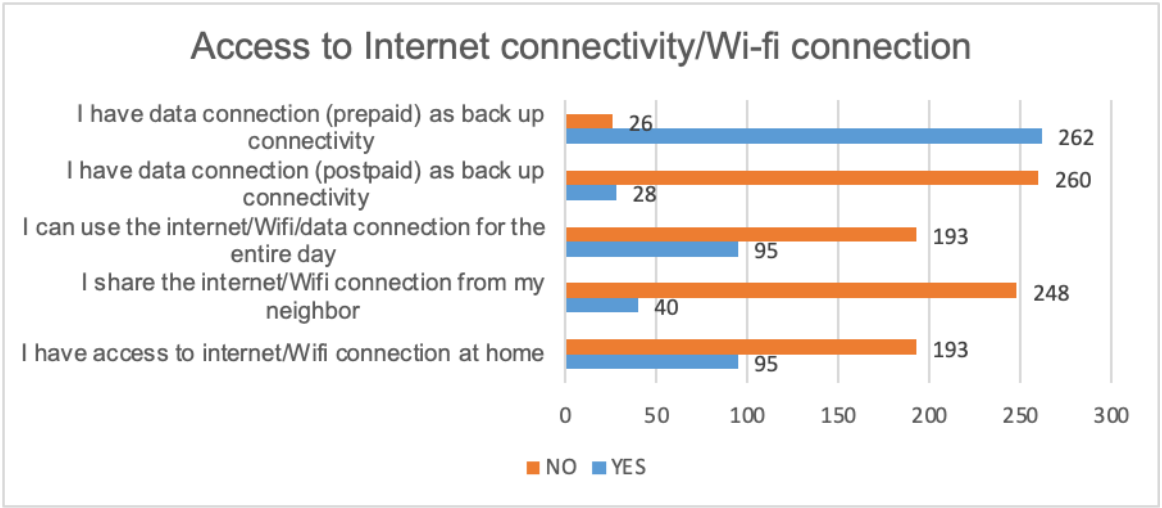


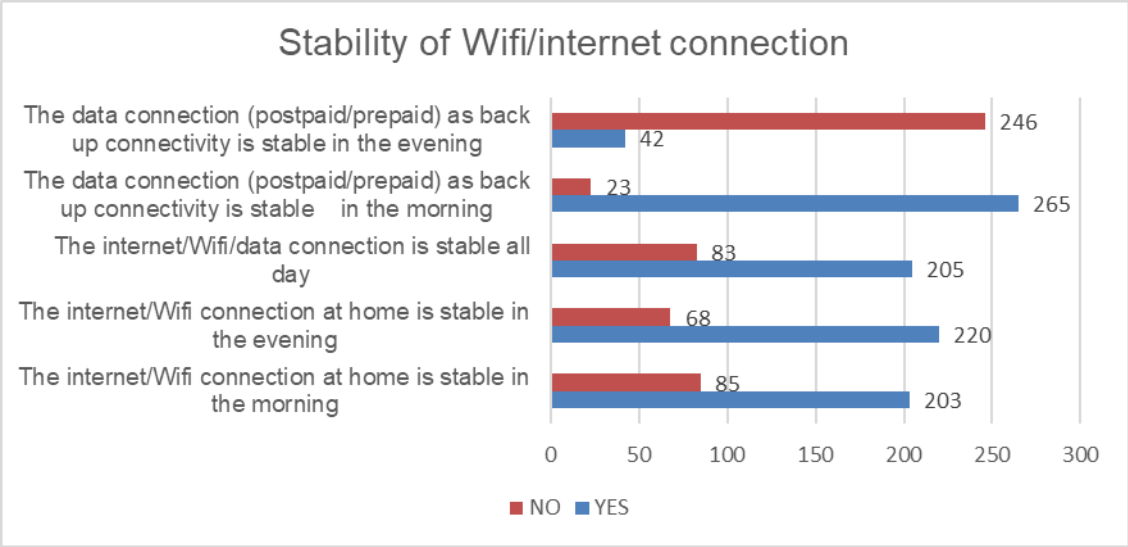
Figure 1 shows that most of the learners (228 or 79.17%) of the learners have access to computer/laptop at home; while only 88 or 30.56% of the total respondents said that they can use the computer/laptop every day. This means that most of them do not own the computer/laptops available at home and share it with the other members of the household. However, 231 or 80.21% of them said that they have an e-tablet that they can use. This is because of the provided e-tablets for the Rosenian learners from the Local Government. It is under the goal of Technovation in the city. Likewise, 258 of the total respondents or 89.58% of them also said that they have mobile phones as an alternate gadget for technology-based learning modality. Thus, 260 or 90.28% of them answered that they use more than one (1) e-gadget in their preferred learning modality.

Figure 2: Profile of learners in terms of online capacity as categorized into access to Internet connectivity/Wi-Fi connection



In the figure above, it shows the online capacity of the respondents based on their access to Internet connectivity/Wi-fi connection. It shows that most of them (262 or 90.97%) utilize prepaid connectivity as back up for their online classes. Only a few, 28 respondents or 9.72%, have postpaid connection that they use when Wifi connection is not available. When it comes to their Wifi/data connection usage, only 32.99% or 95 respondents said that they can use their connection all day long. With regard to sharing Wifi connection from their neighbors, only 40 or 13.89% have that situation, while 95 respondents or 32.99% have their own Wifi/data connection at home.

Figure 3: Profile of the learners in terms of online capacity as categorized into Stability of Wifi/internet connection



For Figure 3 on the Profile of the learners in terms of online capacity as categorized into Stability of Wifi/internet connection, 93.01% or a total of 265 respondents said that data connection (postpaid/prepaid) as back up connectivity is stable in the morning, while 14.58% or 42 respondents have poor data connection at evening. On the other hand, there are 203 respondents or 70.49% with stable internet/Wifi connection at home is stable in the morning, close enough with the 220 of them or 76.39% experience strong internet/Wifi connection at home in the evening. While 205 or 71.18% of the total respondents said that they have stable internet/Wifi connection at home for the entire day.

The results of the survey proved that Santa Rosa City can take advantage of the good internet/Wifi connection of the learners. It is also one of the reasons why technology-based learning modality became possible in the city. Fabella (2021) mentioned in his narratives SDO BE-LCP that the Schools Division of Santa Rosa City boosts its effort to expand the role and importance of ICT in improving the quality and delivery of education and support the teachers in the integration of ICT in the teaching-learning process. Guided by different programs and projects implemented in central and regional level, the ICT Unit implemented different programs and projects that support technology-based learning modalities.

3. What Emerging Themes From the Scenarios Based on the Experiences and Challenges of Learners Amidst the Pandemic Can Be Developed?

Theme 1: Technology in Education

Theme 1, based on the narratives and best scenarios of the learners imply that there is a strong need for the development of technology in education. Learning with technology is only possible if students are technologically literate, which implies a two-step process in which students first learn about the technologies before they can really utilize them to study. However, there have been initiatives to combine the two strategies. Learning about computers and the Internet is combined in this method. It entails teaching the technology skills "just-in-time," or when the student needs to learn them while participating in an activity.

Theme 2: The Role and Function of Technology

The learners have repeatedly brought up the importance of technology, particularly an internet connection, in the overarching narratives about how learning is delivered and assessed, it implies that if everyone was aware of this issue in the crisis situation, learners may eventually return to the regular learning activities outside of the classrooms. According to survey findings, the majority of students and some faculty members live within the city and have internet access.

The technology required for students to interact with each other effectively is another important component to take into account in addition to the internet. In the absence of these, it is necessary to assess the strategy employed during the learner interaction. The problem would be how to create an inclusive IT infrastructure to deliver top-notch instruction to all students given the current health crisis and the change in how education is delivered.

Theme 3: Technology-Based Learning Environment and Assessment

In the gathered narratives, this theme focused on the learning environment and the assessment of learning. When schools instantly turn to online learning as the most practical method of delivery of learning and to alleviate the disruption of classrooms and support continuity of learning. Under this new educational structure, students must stay at home and relocate their classrooms to the same location. However, it is somewhat disregarded that students have various home environments and living circumstances that may affect their learning environment and assessment process through submission of their outputs.

Most of the time, families regularly involved their kids in educational activities. However diverse patterns were seen across various social categories. Low socioeconomic position families and residents of underprivileged areas offered fewer learning opportunities. The reason for this may be in part due to the fact that it can be challenging for families that are economically and socially disadvantaged to obtain the financial and social resources necessary to create an engaging technologically-based learning environment at home.

Theme 4: Security and Safety

Concern for their safety and security is a typical emotion among the parents of the learners in the situations that have been identified based on the provided narratives. According to

Maslow's Hierarchy of Needs, the administration and personnel at the school give priority to students' fundamental needs. Students and professionals have stated that safety and the psychological signs of infection worry are their top concerns (Smith, 2020). It was found in another study that due to job loss, family member loss, and the uncertainty of traveling to the school, the concerns on focused on security and the prospect of continuing education.

The schools must give students access to significant support in order to deal with the hardships, obstacles, and even trauma caused by the pandemic in light of the issues mentioned by the study's respondents. Programs for mental health must be available in formal educational contexts. The tremendous difficulties that students and teachers faced during the epidemic made it less likely that they would be able to successfully complete formal education if their general well-being was weakened.

4. Proposed Strategic Plan for Students' Learning

Proposed Strategic Plan	Technology in Education	The Role and Function of Technology	Technology-based Learning Environment and Assessment	Security and Safety
Prime	Innovative programs in learning modality through technology	Alternative e-services delivery of learning resources	Online and technology-based sites for students' activities and engagement	The arrangement of the classroom with physical distance by student desks for blended learning
Amplify	Upskilling in new normal learning methodologies	Online system for services with some physical transactions when needed	Flexible and adaptive online learning outcome-based assessment	Virtual classrooms for all learning modalities
Utilize	Learning management system to address issues during and after the pandemic	Fully operational learning management system for classes in different modalities	Alternative home-based activities with modified assessment policy"	Support from the LGU, stakeholders, and the community for safety and security

From the generated themes on the salient findings of this study, this Strategic Plan P.A.U. (Plan, Amplify, and Utilize) was designed. This plan can be used as a guide to make school plans in technology-based learning modality for the continuity of education.

Conclusion

1. Respondents favor modular distant learning, according to the learner profile in terms of preferred flexible learning modes. Most respondents who have difficulties in meeting the requirements were because of ICT limitations. While, they firmly agree in the indicators based on their experiences in the supply of additional/alternative criteria. They also strongly agree with the stated indicators based on their personal experiences obtaining feedback on their learning and the learning environment.

2. It was concluded that there are learners who still struggle with using technology when their online capability was categorized into access to e-gadgets, access to Internet connectivity/Wi-fi connection, and stability of Wi-Fi/internet connection. Even though the majority of them have benefited from the assistance of their families and the local government, some of them are still having issues on their online capacity for their studies based on the indicated parameters.

3. The following were identified as the emerging themes from the experiences and difficulties of learning amidst the pandemic: Theme 1: Technology in Education – Students can only learn about technology if they are technologically literate; Theme 2: The Role and Function of Technology – The use of technology is essential when creating materials for online or remote learning in order to maximize their class participation; Theme 3: Technology-based Learning Environment and Environment - necessitates a platform that involves cooperation among educational institutions, parents, and other stakeholders that gives students a quality technologically- based learning environment; and Theme 4: Technology-based Learning Environment – a place where school staff and administration prioritize the basic needs of the learners in safety and security.

4. A strategic plan is needed in order for a technology-based learning modality to become possible. This study resulted with a proposed strategic plan - P.A.U. (Prime, Amplify, and Utilize), that can ensure the effective implementation of different learning modalities.

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