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Challenges and strategies of secondary teachers teaching science: Some stories to tell

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Abstract

This phenomenological study aimed to explore the challenges and insights of the selected science teacher participants facing the challenges in teaching science. The participants in this study were chosen through purposive sampling technique. The instrument used in this study underwent validation both internal and external validators. Empirical data were gathered using an in-depth interview (IDI) and focused group discussions. The results of the study revealed the following themes as to the challenges faced by Science teacher were Difficulty in Applying Scientific Concepts, Virtual Classroom Management, Internet connection and Technical Problem. As to the insights shared by the informant, the following themes emerged Utilization of Online Teaching Strategies and Tools, Assessment of Online Student Performance and, Having an Enrichment Activities; Adaptability to the New Normal and Readiness of Teachers in the New Normal. Finally, the themes generated can be a strong basis for possible intervention or enhancement which will provide benefits in the academic community.

Keywords: secondary teacher, teaching science, phenomenological study, Philippines

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1. Introduction

The intercontinental spread of the Covid-19 epidemic has affected everyone, resulting in a situation that has been labeled as the new normal. According to Huang, et al. (2020), education is one of the industries that this health crisis has most impacted and teaching Science is no exception. The majority of the governments have temporarily closed educational institutions as part of their response to the pandemic, which affected 70% if the world's student population (UNESCO, 2021). Teachers felt its impact on their teaching responsibilities. The study of Carlsen et al. (2020), documented teachers' insights demonstrating that while everyone faces a hard time, educator's responsibility remains the same.

In Chico State California, United States, most science subject faculties are experiencing difficulty in delivering Science lessons with the transition to online classroom platforms such as Zoom. This transition was the major concern of the language teachers since they are forced to rethink their teaching methods and devise new strategies for engaging students online. Align with these, they are forced to conduct discussions asynchronously allowing to have ample time to create films and discussions with voiceovers and illustrations (University Wire, 2021). The same goes in Melbourne as most of the language teachers struggle with conducting proactive classes. They are overwhelmed by the amount of work that needs to be done in exchanging knowledge about concepts in Science online (New Bites- Private Companies, 2020). Changes in new teaching methods give a difficulty to teachers in Valenzuela City, Philippines, in delivering concepts in the Science subject. This is why most teachers are assisted by an information technology specialist and moderator when they are setting up a live broadcast to ensure the usefulness of the online classes. Aside from a lack of experience with computer software and gadgets, a lack of time and a low motivation to study were noticed to be a few of the additional factors for Science teachers falling behind with learning basic abilities in online teaching (Kabagani, 2020).

In Tagum City, the curriculums of the schools have never been busier in terms of realigning their systems to handle educational challenges during the pandemic. According to Limjuco (2018), teachers are continually challenged when it comes to the use of computers and other technological devices in Science online classes instruction. As a result, teachers are encouraged to study how online platforms are being used to provide high-quality instruction related to the subject matter. The researcher felt the need to conduct the study because Science teachers are increasingly concerned about supporting their students learning needs during the pandemic. Moreover, the needs for improving the teaching strategies and coping mechanisms of language educators in secondary schools should be improved. With this study, the researcher is hopeful that the results and findings will benefit teachers and educational institution by allowing them to improve and explore areas of education that are lacking, particularly given in the situation nowadays during the pandemic.

Significance of the study - The researcher believes that this phenomenological study will help to demonstrate the value and importance of preparing teachers in the new standard for teaching Science topics. The researcher will be able to collect data on teachers' daily challenges in conducting classes online, instructional strategies, and insights into teaching in a pandemic. Furthermore, the results and findings of this study will serve as a blueprint for identifying the aspects that these teachers need and how they might provide school-based opportunity for teachers to gain these skills and knowledge. Additionally, this would benefit all DepEd officials by informing and educating them about the realities that our teachers confront on a daily basis in the classroom when teaching science topics. Nonetheless, readers and other researchers may benefit from this study because it provides a summary of secondary teachers' current methods in teaching Science during the pandemic using technological pedagogies and ICT-integrated learning.

2. Review of Related Literature

2.1 Challenges of Teachers Teaching Filipino in Online Class

Teaching Science has to abstract notions that are difficult for children to comprehend because they primarily learn about the world through their senses. Compounded by issues of access and equity, teachers encountered numerous challenges due to COVID-19's move to online secondary Science instruction (Lee, Newton, & Glass, 2021). Despite recognized shortcomings in secondary Filipino instruction, some secondary teachers incorporate Science instruction into their daily routines and seek to improve their teaching (Bradbury & Wilson, 2020). Encouraging students to learn by doing their best defines what Science is all about. At this point, the teacher must lead the class in a hands-on exercise. However, in the new set, teachers are challenged to deliver the mastery of Science competencies because of the pandemic. Since they cannot conduct experiments online, they encourage students to do their investigations at home. In this way, the key concepts in the Science topic are recognized, and students learn the ability to test them (Kesler Science, 2021). Thus, teachers provide direct instruction in this stage and guide them toward a successful learning process (Learning Liftoff, 2018)

Best (2019) also claimed that issues hider the effective integration of online classes into teaching and learning, including generational differences in teachers, challenges managing online classrooms, poor internet connections, and a lack of fundamental computer skills. Significantly, professors' efficient operation of online courses is influenced by various factors, regardless of the environment in which this problematic issue is studied. Elliot (2021) added that engagement in learning is essential in the Science subject. This phase is defined by how teachers entice their students to pique their interest and direct their attention on the work, object, situation, problem, or event. However, this online modality results in poor communication between the instructor and students. Resulting in a lack of motivation in the virtual learning environment, students misbehave and become unruly, which most definitely leads to failure in online learning.

Also, Bhattacharya, Howard, & Ulferts (2020) stated that despite the overall adaptation of digital learning, there are some disparities in how students feel about online learning. Learners indicated that they had a deeper understanding of concepts and principles better in face-to-face than in online classes. It shows that instructor and student engagement is an essential aspect missing in an online course. Supported by Chakraborty (2017), who feels that teachers lack appropriate methods and tactics for building active social connections in the online learning environment to address these asynchronous learning behaviors. Additionally, computer-mediated learning limits instructors' ability to deal with behavioral manifestations. It resulted in unhappiness with the lack of clear communication between teachers and students, voiced discontent with the instructor's or learners' lack of interaction, and highlighted focus, motivation, and difficulty concerns in the simulated learning environment.

Stable internet has always been a problem in the online teaching platform. Yebowaah (2018) stressed that the internet can be utilized for knowledge and education and that it has benefited them tremendously in enhancing their academic achievement in online classes. The internet is a supplemental learning resource and instructional content, and its use has increased students' academic performance: hence, its availability and connectivity must increase. Moreover, developing and implementing a practical online lesson takes time, even more so for people who have never used digital teaching tools before. Teachers indicted two primary concerns; (a) a lack of time to master new digital tools; and (b) the increased time required for teacher preparation while learning digital technology (Zhang, 2020).

Teachers aim to become fluent in using digital tools in a professional setting better and navigate freely in digital culture in the digital age (Erkmann, 2015). Along with the increased availability and accessibility of online education in the early 2000s, the term "Digital Culture" developed and was subsequently applied to teaching instruction. There is scant evidence that children and teachers support integrating digital learning methods (Hendriks, 2016). According to Prensky (2015), the apparent difference between "digital natives"

technical abilities and interests and those of the older generation of teachers is limited, making modern education pedagogies ineffective. He says that the teaching environment, from the classroom to online courses, has developed to the point that teachers in our educational system, particularly the more experienced ones, are no longer qualified to educate.

Also, in his study, Kolbakova (2015) states that adding online platforms to the teaching and learning process demands additional effort and time. Distance education via online courses may not be appropriate for all learners in all circumstances, and for all purposes and hence requires practical learner training to be effective. Lastly, Babinčáková & Bernard (2020) added that transitioning to a virtual environment presented difficulties for teachers who desired to transfer real-world classroom experiences to online lessons, as science involves problems, observations, evidence, and experiments. Frequently, teachers asserted that they could be more efficient if they possessed the necessary knowledge, skills, and equipment to conduct online classes.

2.2 Strategies in Teaching Science Online

Engagement in learning and teaching is imperative. Zhang (2020) emphasized that to engage students in online education, teachers must employ various techniques, simpler technologies, and platforms for computer-assisted online classes than those available in traditional classrooms. This study discovered that a significant level of unhappiness emerges when a course is inadequately designed due to students' unfamiliarity with the software being utilized and excessive time searching for needed details. Now would be the moment for science teachers to provide quality education. It must be managed virtually from lesson planning through class management and assignment delivery. Students will feel more motivated if more technology and various platforms are used, which fundamentally suits the learners' particular demands and promotes more literature-based connections that are both intriguing and amusing (Mayol, 2020).

Apart from these aspects, research has discovered that technology in the new normal is essential for assessing performances (Leo &Puzio, 2016). It was revealed that using technology for evaluating science courses enhanced students' interest in the learning process, increased students' achievement scores, and assisted students in completing their assignments more readily than traditional teaching techniques (Nawzad, Rahim, & Said, 2018). Evaluating performances allows proving mastery using creative methods (Kesler Science, 2021). Teachers assess student learning through performance and informal and formal assessments. This challenges teachers to go over all student misunderstandings noted throughout the unit and ensure they are corrected. Educators present students with a challenging scenario to which they must apply their newly acquired knowledge. Students may demonstrate their comprehension of science subjects by written or vocal evidence (Elliot, 2021).

On the other hand, most students have infrequent study habits and are disturbed by other things, which causes them to fail subjects. Therefore, implementing and acting as a curative or remedial plan improves their productivity, creativity, and academic performance (Gargar, 2016). Wawuda (2019) also stated that using online tutorials, such as inscience, allows teachers and students to watch and research in real-time. This helps both teachers and students understand complex concepts more easily in learning various techniques and skills to teach online and, at the same time, improve performance. However, Lee, Newton, and Glass (2021) suggested that the lack of formal teacher-student interactions hampered learning. Still, it limited the emotional assistance instructions could give their kids, especially in these difficult circumstances. Teachers are unhappy with the change since it does not represent their pedagogical perspective. They think that successful education involves students participating in hands-on, mind-on interactions while acquiring concepts from diverse backgrounds. As a result, teachers must supplement activities to teach science, vast concepts that require further explanation and comprehension.

2.3 Learnings of Teaching Science Online

For schools to effectively adopt synchronous learning, a better knowledge of the function of school

education in the context of information culture and the interdependence of elements that promote improved student performance is required. Teachers must have a positive computer skills mindset and consider the relationship between teaching and learning online. For instructors to make a difference, they must utilize and understand the value of online classes and their purpose and position in the teaching and learning process (Phelps and Graham, 2015).

Based on his research, Salavati (2016) concluded that instructors must have a minimum amount of daily job experience embracing evolving technologies to adjust to the significant changes that technology has brought about in the educational setting. This necessities exposure to computer usage in the classroom and the concept of new media in the classroom. On the other hand, science teachers' self-efficacy perceptions are critical in an innovative teaching style, especially in the new normal. Teachers are essential in making science attractive. If they are self-assured, credible, interested, and enthusiastic, science becomes an engaging topic, thus resulting in improved academic achievement in elementary science education (Sen and Vekli, 2016).

In addition to this, when considering the benefits of online learning, one should also examine the importance of readiness in certain circumstances. Danver (2017) asserts that seminars and training on online courses are particularly beneficial since they enable professors and students to make the most use of the knowledge they acquire. Consequently, they will be able to utilize a variety of educational methodologies. In their study, Essein et al. (2016) said that instructors such as science lecturers could engage in and attend a series of training sessions and seminars to promote and optimize the application of newly acquired technical skills in online education. It means acclimating instructors to new and acceptable methodologies, experiences, and abilities to ascertain how to increase the competence, dependability, and effectiveness of every public school teacher's performance.

2.4 Research Questions

- What are the challenges of secondary teachers teaching science concepts during pandemic?
- How do the secondary teachers strategize teaching science concepts during pandemic?
- What are the learnings gained by the secondary teachers during the pandemic?

3. Methodology

Participants - The participants of this study were the secondary teachers handling science subject in Tagum City Comprehensive High School. We used purposive sampling to select these participants. There were even (7) participants for the in-depth interviews and seven (7) for the focused group discussion. The researcher believed that the total fourteen (14) participants reflects consistent, reliable, homogeneous and objective in order to accurately identify the study population (Garg, 2017; Matamala, 2021).

Research Instruments - The researcher prepared an interview guide which is a set of questions that allows responses from the participants for the purpose of information. (Menken, Post, Gaast, Keestra, & Koenders, 2020). The three sections that serve as a guide during the IDI and FDG interviews were preliminary questions, content proper questions and concluding statements. Content proper questions were composed of the three research questions and supporting questions. Finally, three concluding questions were asked to them. During the IDI interviews, the researchers asked questions to the participants and recorded their responses using a standardized procedure. On the other hand, for the focus group discussion, selected participants were asked about their opinions or perception concerning a particular topic (Roni & Djajadikerta, 2021).

Research Design and Procedure - The study applied a qualitative method of research with a phenomenological approach that deals with the people's lived experiences. (Pathak, Jena & Kalra, 2013). The study was performed through in-depth interview (IDI) method to gather data from a small number of members of a population and a focus group discussion (FGD), which brings together individuals with comparable backgrounds or experiences. The researcher engaged in a flexible conversation on a variety of topics, facilitated

by an interviewer (Roller & Lavrakas, 2015; Gundumogula, 2020). Using this type of research approaches enable the researcher to discover the most prevalent concerns and experience by science teachers in elementary school teaching science concepts in this pandemic and how it should be handled. Using phenomenology, the researcher was able to identify the difficulties and the coping methods faced by these teachers and also to devise a strategy for resolving them.

4. Results and discussion

This section presents the experiences of the research participants, their insights as well as their ideas, concepts, and aspirations which emerged from the information gathered through the conduct of the focus group discussion and in-depth interview.

4.1 The Challenges of Secondary Teachers Teaching Science Concepts during Pandemic

The discussion focused on the relevant issues and essential points about the challenges of secondary teachers teaching science concepts during pandemic. The components of the discussion were derived from the responses of the participants where four (4) major themes emerged: *1) Difficulty in Applying Scientific Concepts, 2) Virtual Classroom Management, 3) Internet connection, and 4) Technical Problem*

Table 1

Themes and core ideas on the challenges of secondary teachers teaching science concepts during pandemic

THEMES	CORE IDEAS
Difficulty in Applying Scientific Concepts	having difficulties in teaching scientific concepts online
	struggling to conduct experiments as a requirement in some competencies in science
Virtual Classroom Management	noticing learners not engaging in class
	experiencing students turning off their cameras during class
	observing students distracted with other things instead of focusing in class
Internet connection	experiencing slow internet connection
	struggling to interact due to lack of internet
	taking no control over internet stability
	noticing no assurance of 100% attendance due to poor internet connectivity
Technical Problem	facing difficulties to learn new things due to being outdated with technology
	struggling in manipulating the internet and computer
	being not familiar with the computer shortcut commands

Difficulty in Applying Scientific Concepts - According to the participants' responses, being unfamiliar with this way of communication hindered their ability to perform at their full potential when conducting scientific concepts. Most teachers stated that discussing science concepts in the new normal is ambiguous, particularly when it comes to topics that require experiments or actual first-hand experiences. Science is best taught hands-on, and teachers struggle with various teaching modalities. Teachers worked to focus on the content they were responsible for teaching and faced numerous challenges due to the pandemic. Given Lee, Newton, & Glass (2021) statement, the fact that secondary science instruction is recognized as lacking, some secondary teachers include science instruction into their everyday routines and strive to enhance their teaching. Moreover, since they cannot conduct experiments online, they encourage students to do their investigations at home.

Virtual Classroom Management - The study's findings indicated that most teachers felt constrained when enforcing discipline and engagement in online instruction. They stated that conducting the class online rather than in-person impedes and limits the implementation of disciplinary measures because teachers have limited options for apprehending misbehaving students. Teachers struggle to keep all students on the same page because

some students prefer to take classes from home, and others disable their cameras, preventing teachers from monitoring their activities. According to Chakraborty (2017), pupils misbehave and become unruly due to insufficient contact with the teacher and a lack of encouragement in the simulated learning environment, which most likely results in online learning failure. While teachers lack adequate approaches and techniques for cultivating active social relationships in the online learning environment to combat these attitudes toward synchronous learning, she asserts that computer-mediated learning limits educators' ability to intervene with these behavioral manifestations.

Internet Connection - The study's findings indicated that participants observed and experienced various difficulties with internet connectivity, both for teachers and students. They stated that their classes are rescheduled or canceled, and they are forced to provide additional activities for students who did not enroll in an online class session. These were caused by teachers and students encountering inconsistencies in internet speed, preventing them from having a smooth online class. Additionally, these issues affect students' attendance rates, leaving teachers no choice but to devise alternate methods for their students to make up for missed lessons. In comparison to other readings, this conclusion is relevant to the research of Best (2019) which identified poor internet connectivity as one of the issues impeding the positive integration of online classes into teaching and learning. Regardless of the context in which they discussed this concerning issue, they emphasized that teachers' effectiveness in conducting online sessions is contingent on various conditions, including slow and inconsistent internet connectivity. Yebowaah (2018) also added the internet as a source of knowledge and information, claiming it helped improve their academic performance in online classes. The internet is being used in schools to supplement classroom instruction and instructional resources, and its use has improved student academic achievement. As a result, its availability in schools must increase.

Technical Problems - Teachers' struggles with the technical aspects of online teaching emerged as another common theme in their responses. Asynchronous learning software and applications were difficult to manipulate for some participants. Others stated that they are not "digital natives" or are not as familiar with these technologies in teaching as they should be. Lessons are delayed, or teachers cannot be creative due to their lack of knowledge or ability to manipulate and configure these applications**.** In this regard, Prensky (2015) supported the idea that there appears to be a gap between the technological capabilities and demands of "digital natives" and the older generation of instructors' basic technology, which can be the ineffectiveness of modern educational pedagogies. More precisely, he believes that education has evolved so dramatically away from traditional classrooms and online classrooms that our school system's instructors, even the most experienced, are no longer meant to educate.

4.2 The Strategies of Secondary Teachers Teaching Science Concepts During Pandemic

Participants revealed three instances as the most prevalent strategies that they perform to cope with the challenges they face in teaching science concepts online. Three (3) major themes emerged: *1) Utilization of Online Teaching Strategies and Tools, 2) Assessment of Online Student Performance and 3) Having an Enrichment Activities*

Utilization of Online Teaching Strategies and Tools - According to the science teachers' responses regarding how they strategize with online classes, they considered using online teaching strategies and tools to be one of the actions they took to conduct synchronous teaching via an online class. In this theme, science teachers viewed the shift to online classes as an opportunity to acquire new abilities and explore innovative tools that enable them to deliver their lessons in new and innovative ways. Additionally, it allows them to select the software and applications they are most comfortable using during online classes. Zhang (2020) backed this idea that the rise of online education has resulted in significant changes to learning situations since it enables learners and teachers to explore, access, and portray material dynamically and in multimodal formats. Additionally, the interactivity, adaptability, and convenience of internet users have created enormous potential for teachers and students to creatively acquire, expand, change, and share knowledge and ideas at their speed and in their own

time.

Table 2

Themes and core ideas on the strategies of secondary teachers teaching science concepts during pandemic

THEMES	CORE IDEAS
Utilization of Online Teaching Strategies and Tools	having to learn creative strategies for the online class in conducting an online class
	showing videos and PowerPoint presentation during online classes
	using Zoom, Google Meet and Messenger as an easier application to use in teaching online
Assessment of Online Student Performance	submission of outputs through online
	video requirement for students for certain performance tasks
Having an Enrichment Activities	created more learning exercises to monitor students' progress
	sent offline links and PPT slides through group chats for student's self-learning
	conducted another session for remedial class and intervention.

Assessment of Online Student Performance - Science teachers indicated that the assessment component of the online classroom is critical. They provide digitization of learning and submission of outputs to inform students about their progress via a course, ascertain their specific strengths and limitations and their progress in a course, identify individual strengths and weaknesses, and serve as a measure of whether students meet the course's learning objectives. It is critical in the online process because it allows for timely feedback for all participants, enhancing learning and teaching experiences. Nawzad, Rahim, and Said (2018) discovered the idea that employing technology in conducting assessments boosted students' learning process, raised students' accomplishment scores, and supported students in completing their tasks more quickly. Moreover, students may demonstrate their comprehension of the subject when being monitored frequently.

Having an Enrichment Activities - When online classes are disrupted or delayed, most teacher-participants agreed that they learned about providing additional offline activities and supplemental materials to provide remedial lessons to students who missed classes. This additional material provision entails sending offline links, recorded videos, and PowerPoint slides to students failing in a specific lesson. On the other hand, teachers maintain follow-up schedules for individual students, calling them via messenger or Zoom. The study's findings supported Wawuda (2019) statement that not all students can manage learning processes, resulting in a range of outcomes. With this in mind, teachers must devise a strategy for ensuring that these additional pupils do not fall behind while still finishing the subjects at hand. He discussed how teachers initiate remediation exercises with students based on their academic progress, utilizing techniques and strategized methods to boost student information retention. Additionally, Gargar (2016) stated that the majority of students have inconsistent study habits and are distracted by other activities, which results in them failing subjects. Thus, implementing supplemental activities helps alleviate students' depleting performance and acts as a curative or remedial plan to develop students' productivity, creativity, and academic performance.

4.3 The Learning Gained by the Secondary Teachers during the Pandemic

The teacher-participants shared different ways when asked on their learnings as to how should a teacher act and what should be their attitude towards the changes in the educational system particularly in teaching online classes. Two (2) major themes emerged: *1)* Adaptability to the New Normal*, 2)* Readiness of Teachers in the New Normal

Adaptability to the New Normal - The teacher-participants shared their thoughts and ideas on how experienced teacher can significantly improve their online teaching abilities despite a lack of technology skills. They all agreed that with the right attitude toward technology and all experienced teachers who are struggling

with online technicalities could quickly adapt to changes in teaching. Particularly in applying technology-driven skills to conduct online classes, as long as they understand and appreciate the function and utility of this modality in general. Teachers' manifestations correlate to the findings of Phelps and Graham (2015). They indicated that teachers must develop a positive attitude toward computer skills and consider the link between teaching and learning online. Many instructors originally reviewed their work units to see how they might utilize online courses to promote innovation and engagement, such as using ICT to solve an issue or for essential online study. To effect change, teachers must acknowledge the benefits of online courses and their purpose and role in the teaching and learning process.

Table 3

Themes and core ideas on the learning gained by the secondary teachers during the pandemic

THEMES	CORE IDEAS
Adaptability to the New Normal	be innovative to transformations in the system be open-minded in learning relevant skills have resiliency in adapting to new trends in teaching
Readiness of Teachers in the New Normal	providing with seminar-workshops in teaching online attending training for preparation in an online class giving technical skills training for the regular classes.

Readiness of Teachers in the New Normal - Additionally, participants indicate that they should entail a series of webinars, training sessions, and hands-on application of the new skills to prepare for the task associated with conducting online classes. As a result, they can develop an affinity for and familiarity with the applications, software, and devices necessary to teach synchronous learning. Numerous educators have expressed their hope that the DepEd's technology-driven training will significantly increase their knowledge and ability to manipulate the necessary tools to be effective online educators. Seminars and training on online courses are particularly valuable since they enable teachers and students to manage the knowledge they acquire most efficiently (Danver, 2017). Consequently, they will be able to employ a range of instructional methodologies, ensuring that teachers and students no longer restricted to traditional ways of storing and delivering knowledge and that they may grow their teaching abilities through online classes. Furthermore, this is supported by Essein, Akpan, and Obot (2016), instructors should participate in training and workshops to maximize their application of newly acquired skills when teaching online. They claim this will help instructors learn new abilities and keep up with new information. It aimed to acclimate instructors to modern and contemporary accepted methodologies, knowledge, and abilities.

5. Conclusion and implications

As time passes, the educational system and teachers gradually become more reliant on technology, particularly during the pandemic. These science teachers considered ways to conduct classes efficiently and safely without jeopardizing the children's health; as a result, they adapted and progress into online teaching. As they gradually adapt to it, they encountered difficulties primarily in technical manipulation and conducting a proper class online due to the lack of an internet connection. Most teachers face these obstacles and dilemmas due to their limited knowledge of the technical aspects of online education and the internet connection, which is out of their control. This study, which examined the challenges, strategies, and learnings of science teachers in online education, emphasized the study's significance and necessity. The findings indicated that the experiences encountered by teachers had a significant impact on the teaching-learning process. Teachers encountered a variety of trials, difficulties, and struggles during their transition periods from Face-to-face instruction to online instruction. However, these difficulties did not discourage them from the job; instead, they sought to overcome them by strengthening their commitment to teaching through various coping mechanisms, including seeking assistance from experts, providing supplemental activities, and utilizing online tutorials. The researcher viewed this study as a test and a significant exploration. The findings of this study enabled me to gain insight into the perspectives of secondary science teachers regarding online classes. I also had the opportunity to learn about the various challenges and difficulties and the teachers' perspectives on the participants' teaching science in online classes. As a result, the solutions that must be implemented apply to everyone in the field. The contribution of

this study is entirely dependent on the revelations made by participants during the interviews, their current perceptions of discipline, their challenges, difficulties encountered, their coping mechanisms and strategies, and their insights and learning's into their experiences as a science educator in the new normal.

5.1 Implications for Teachers

This study will help science instructors who have been exposed to the reality of public secondary school challenges with delivering online classes and integrating ICT into scientific lessons and teaching experiences. The findings may assist them in developing the appropriate motivation and attitude toward learning how to conduct online classes, as well as in coping with the necessary application throughout the sessions.

5.2 Implications for Education Students

The result of this study broadens the knowledge of the education students as to what is happening in the world of teaching. It serves as an overview of what might happen in the future when they continue to pursue teaching with the use of ICT. The students would know the possible actions and strategies that can be taken in the same situation would be encountered.

5.3 Implication for Future Readers and Researchers

Nonetheless, this study may benefit readers and other researchers by providing information about the current state of science teachers' proficiency in providing a more modern education to today's generation of students through the use of technological pedagogies and ICT-integrated learning via online classes.

5.4 Concluding Remarks

As I first conceptualized my qualitative research, I felt reluctant about it. I thought of the contention that it would give me. At first, I just formulated a simple title for my study. Being in the field of education, I have known the sentiments of teachers facing challenges in their instruction. I felt motivated to conduct this study because this is very timely issue that confronts the education system at present. In our world today, it is very evident that teachers experience the same sentiments in facing different challenges in giving instruction during online class especially the science teachers. Many teachers complain about the different problems that they faced specifically in in delivering their instructions in doing experiments. Even students have difficulty in doing the said tasks. How they are going to perform and meet the expected results. Appropriate strategies should be implemented for learning is of utmost importance and impacts largely the performance of the learners. Education experts have confirmed through their worldwide research that young learners who are motivated with the different strategies used by the teachers are more apt to develop their understanding, motivation and learning. Determination, interest and motivation established a strong foundation for improved learning and performance.

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