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Lived Experiences of Out-of-Field Senior High School Teachers Teaching Physical Science

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ORIGINAL ARTICLE

LIVED EXPERIENCES OF OUT-OF-FIELD SENIOR HIGH SCHOOL TEACHERS TEACHING PHYSICAL SCIENCE

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ABSTRACT

This study investigated the experiences of Physical Science teachers who were not specialized in their field. Twelve out-of-field Physical Science teachers, selected via purposive sampling from the Schools Division of Baybay City, participated in the transcendental phenomenological study. For data collection and subsequent thematic analysis using Colaizzi's seven steps, in-depth semi-structured interviews were utilized. Five metaphors describe the study's findings in the form of emergent themes. The first theme is the Chameleon teacher described as an adaptable teacher, analogous to a chameleon that alters its coloration to blend into its surroundings. Developing a resilient mindset is the second aspect, symbolized by the Phoenix Within, which signifies the capacity to triumph over challenges. Thirdly, the Symphony of Knowledge symbolizes teachers' and learners' synergistic partnership and active participation throughout the educational journey. The fourth theme, the Gardener of Knowledge, compares an educator to a conscientious gardener who nurtures their development and that of their students. Crossing Unfamiliar Territory is another theme that examines Physical Science teachers' difficulties when instructing outside their field. As a result, the experiences of these teachers mitigate the issue at hand, thus positively impacting the student's academic development. Sustaining resilience in the face of adversity was inexplicably enhanced through implementing fostering strategies and cultivating a positive mindset. Similar to the adverse encounters, they must confront the obstacles posed by their lack of pedagogical expertise, content knowledge, and struggles. The favorable and unfavorable experiences of physical science teachers who did not specialize in their field provided them professional development opportunities. They underscored the value of maintaining a positive outlook.

Keywords: *out-of-field teacher, physical science, transcendental phenomenology*

INTRODUCTION

Physical Science is one of the learning areas in senior high school that specifically covers Chemistry and Physics. The subject covers explicitly the knowledge content about matter, light, motion, magnetism, and electricity as well as applications of these concepts to daily living such as cosmology, vision, medical instrumentation, drugs, sources of energy, pollution and recycling, fitness, and health" (DepEd, 2016). Learning these competencies would engage an individual in developing critical thinking skills and contribute to applying these concepts correctly for higher education. Eventually, this would add up to an excellent workforce for the betterment of the nation.

Along with the complexity of the nature of the subject, it posed challenges to the science educator's community, especially in dealing with varied kinds of learners. Physics teachers' views were that it is a teaching career that challenges and needs passion and commitment to let students understand mathematical abstracts (Anne & Migue, 2022). Therefore, it is a big concern for science teachers to emphasize the different factors that influence the teaching and learning process, especially the science content knowledge and the pedagogy in teaching (Montebon, 2015). This factor encompasses the ability of science teachers to deliver the science concepts well.

The delivery of instruction to adequate content knowledge is expected to be administered by teachers specialized in science subjects. However, the new Department of Education (DepEd) system has several changes as to its implementation. Part of it is the inclusion of Physical Science as one of the mandated subjects in the Philippines by Republic Act 10533, also known as the "Enhanced Basic Education Act of 2013," commonly known as the K-12 Curriculum. It is stipulated in Section 8 of this law that teachers who are graduates from science-related courses without Licensure Examination for Teachers (LET) are hired in Senior High School (SHS) provided that they will get and pass the LET within five years. Part of the entry in SHS is the mandatory training aligned to their specialization, also described in Section 7 of the same law described as "Teacher Education and Training."

However, it is inevitable that some teachers, in the long run, would teach learning areas beyond their specialization. With this, a phenomenon called out-of-field teaching is triggered in some schools (Goos et al., 2021). This practice arises when there is an imbalance between the demand and supply of teachers with the necessary qualifications and subject-matter expertise. Thus, it adds to the challenging task of delivering the concepts of physical science well (Co et al., 2021; Montebon, 2015). Additional implications for teaching outside of a field highlight issues with subject-specific knowledge, procedures, and abilities, as well as challenges with teaching practice (Crisan & pi, 2019).

Scholarly investigations have examined the intricacies of comprehending and managing out-of-field instruction (Hobbs & Torner, 2019). Science educators encountered challenges, obstacles, uncertainties, and a need for self-assurance throughout the pedagogical and educational processes (Abadianao & Boco, 2020). In addition, science educators encountered challenges in the intricacy of scientific subjects, encountered obstacles in devising lesson plans, and held erroneous beliefs regarding implementing teaching methodologies and facilitating classroom exercises (de Pablo & Dordas, 2022).

Physical Science is one of the subjects at Baybay City Senior High School that is impacted by out-of-field instruction in light of the circumstances above. Physical science was already a complex subject to instruct for specialized science teachers when senior high school was first implemented; this difficulty would be exacerbated for an individual needing more expertise in the subject matter. A comprehensive understanding of the experiences of physical science instructors from other disciplines is crucial for informing the development of new policies and programs for the instruction of physical science lessons. Describing the lived experiences of teachers teaching Physical Science may provide feedback to the Physical Science teachers themselves to reflect and realize how such experiences may improve their abilities to handle the subject and deliver lessons to the students. Presenting the lived experiences of out-of-field Physical Science teachers to the school administrators may also provide information for a proposal to improve and modify programs and policies to benefit teachers' capacity to teach the subject. In addition, posting these lived experiences of out-of-field teachers through publications may be a guide for the upper management, such as the Division office (DO) and the regional office (RO) of DepEd, to provide training and seminars relevant to the experiences of teachers teaching Physical Science subjects.

Under RA 10533, the physical science subject of the senior high school K-12 curriculum is a relatively recent addition to the Philippine basic education curriculum. It ranges from elementary and junior high school to tertiary education, such as college and postgraduate studies. The condition leads the DepEd to hire teachers with different levels of qualification (DepEd, 2016). The law requires that teachers in basic education, including SHS, must be licensed teachers. The subject of physical science requires specialization in chemistry and physics. However, there are rare majors in those subjects. Thus, this forced DepEd to hire non-licensed teachers handling these subjects, specifically coming from colleges and universities, and they were given five years to pass the LET (DepEd, 2016).

In the Philippines, efforts have been made to improve Science Education, specifically in Physical science subjects, because it provides learning competencies such as the daily life routine of an individual and application to the relevant courses that they would take in Tertiary Education to make every learner an independent citizen to help in nation-building programs. Physical Science teachers have a significant

role in producing these students for our country. The National Academies of Sciences (2019) concluded that science educators should employ inclusive pedagogies to facilitate student learning by valuing and contextualizing differences as valuable assets, incorporating students' identities and life experiences, and capitalizing on local and dynamic perspectives of cultural life to inform scientific inquiry. This study provides a significant opportunity to gain insights into educators' practical experiences and raise awareness among higher-ranking members of the DepEd organization, including teachers, regarding the impact these experiences had on the learning and teaching process.

Baybay City Senior High School (BCSHS) is the only stand-alone school in Baybay City Division, which offers only levels of Grade 11 and Grade 12. The school offers three tracks in Senior High School. One is the Academic Track covering all four strands, which are Accountancy and Business Management (ABM), Humanities and Social Sciences (HUMSS), Science Technology, Engineering and Mathematics (STEM), and General Academic (GA). Second is the Technical-Vocational-Livelihood track, which offers several programs from four different strands, such as Agri-Fishery Arts (AFA), Home Economics (HE), Information and Communication Technology (ICT), and Industrial Arts (IA). The third one is the Arts and Design Track, which offers Media Arts, Visual Arts, Literary Arts, Dance, Music, and Theater.

Based on data from the DepEd Learners Information System (LIS), BCSHS's enrollment has steadily risen from 704 students in the 2016-2017 academic year to a current figure of 2,605 students as of the 2022-2023 academic year as a result of the highly diverse array of opportunities available to students. As a result, particularly in physical science, the number of students exceeds the availability of qualified and subject-matter experts in the academy. As a fundamental subject in senior high school, this course is required for all students, irrespective of strand or track. Collectively, these factors contribute to the scarcity of subject-matter experts in the classroom.

With this situation at Baybay City Senior High School, the school management team let non-specialized Physical Science teachers handle Physical Science subjects. This subject requires teachers who are majoring in Chemistry and Physics. However, based on the report of the subject loading by the school administrator, most of the teachers who were given the task of teaching the subject were biology-specialized teachers. Thus, these teachers are preparing lessons outside of their field of specialization. Since the commencement of the senior high school implementation in the 2016-2017 academic year, no seminars or trainings have been conducted to specifically address the knowledge content or delivery of Physical Science for the science teachers at BCSHS. With this, teachers were preparing their strategy to manage the delivery of the concepts of the subject.

The study's results by Rebucas and Dizon (2020) indicated that teachers handling subjects not in the field of specialization have challenges in mastery of the lesson and subject preparation. A study by Gimba R. W. et al. (2018) presents a negative attitude and poor performance in Science and Technology because of the poor foundation of the teachers in the Science and Technology context. Teachers need help with the meaning of the non-technical words used in the science context, and many need to be proficient in the science classroom discourse; thus, the teaching and learning process is compromised. This present study discovered significant experiences of challenges and opportunities of out-of-field Physical Science teachers, which may contribute to significant innovations in teaching and learning Physical Science subjects.

A knowledge gap was identified in the prior research regarding the practical experiences of senior high school teachers who were not specialized in Physical Science. Prior research has primarily concentrated on the challenges and strategies associated with out-of-field teaching, neglecting to examine the lived experiences of out-of-field teachers who teach Physical Science in senior high school, including several uncharted facets that recently garnered scholarly interest in out-of-field instruction (Augusto, 2019). Additionally, several studies uncover obstacles and prospects associated with out-of-field instruction (Apau, 2022; Arendain & Limpot, 2022). Furthermore, existing research has examined the lived experiences of specialized teachers who teach Physical Science using inquiry-based learning (Gloria & Ramnarain, 2021; Mokiwa & Nkopodi, 2014). Although research has produced findings regarding the experiences of Physical Science specialists, additional investigation is still needed into non-specialist

Physical Science teachers' perspectives to comprehend why this does not occur with Physical Science specialists.

Research Questions

1. What are the lived experiences of out-of-field Senior High School teachers teaching Physical Science subjects within the Schools Division of Baybay City??

RESEARCH METHODOLOGY

Research Design

This research utilized a qualitative methodology, specifically Husserl's (1859-1938) Transcendental Phenomenological design, to describe the lived experiences of senior high school teachers not specialized in Physical Science. This methodology is considered to reflect an individual's "lived experience" or perception of an object, as it captures how an individual perceives the world and his or her description of reality (Merriam, 2014).

Research Respondents

The participants included in this study were 12 senior high school teachers selected through non-probability purposive sampling. This sampling method is the selection of participants who meet pre-determined criteria of importance. Each research participant was chosen based on the following criteria such as (a) an out-of-field Senior High School teacher, (b) the teacher is teaching Physical Science subjects, and (c) a teacher who gave consent to be part of the sample of the study.

The study was conducted in some schools of Baybay City Division, Baybay City Leyte, offering Senior High School, particularly Physical Science subjects. Seven schools were involved that comprised the 12 teacher participants in this study. These are the Baybay City Senior High School, Baybay City National Night High School, Pomponan National High School, Mailhi National High School, Banahao National High School, Gabas Integrated School, and Mapgap Integrated School.

Research Instrument

This study employed a semi-structured interview comprised of open-ended questions. Following Creswell's (2012) concept, this is a prevalent instrument utilized in qualitative research. Additionally, it is noted that qualitative interviews consist of researchers posing generally open-ended questions to one or more participants while documenting their responses. Therefore, a One-on-One in-depth interview utilizing open-ended questions was utilized for this study, which was advantageous because the open-ended responses allowed for investigating the participants' rationales for the closed-ended responses and identifying any comments they may have had.

Another instrument used is the smartphone, a recording device to aid the data collection process and ensure all participants' responses were recorded. In addition, this study used field notes during the interview to document the relevant information shared by the participants. Moreover, the researcher conducted the interview process.

Data Analysis

This study used Colaizzi's seven steps of data analysis, commonly used in analyzing qualitative data from transcendental phenomenological studies. This approach described the lived experience of out-of-field Senior High School teachers teaching Physical Science. The first step involved is familiarization with the data through a series of readings and re-readings of all the data, which immersed and made the researcher familiar with the content. The second step was the identification of significant

statements and phrases from the data that seemed particularly relevant and significant to the lived experiences of out-of-field teachers teaching Physical Science.
The third step was the formulation of meanings, which was further summarized into codes that still describe the meaning of the statements extracted from the data. During the process, a developed matrix was used to present a duplicate copy of the significant statements with their corresponding meanings and codes to help look for patterns, similarities, and differences among the codes to identify common themes or concepts. The fourth step was the clustering of themes. Along the way to this step, the steps from one to three were repeated to analyze the data from other interviews with other participants involved in this study.
The fifth step was creating a comprehensive and exhaustive description of the lived experiences of out-of-field teachers teaching Physical Science based on the clusters of themes identified in the previous step. The sixth step was the development of fundamental structures of themes and sub-themes, which involved discussion of the results in a narrative format to describe more the underlying structures that constitute the out-of-field teaching phenomenon of the subject of physical science.
Finally, the seventh step involved validation of the description from the previous steps, which includes validation of the developed descriptions and fundamental structures of the themes and sub-themes by returning to the participants and presenting to them the full results of this study to ensure that the results were valid, and to help establish the trustworthiness of this study.

RESULTS AND DISCUSSION

This transcendental phenomenological study described the lived experiences, using metaphors, of the out-of-field teachers teaching the subject of physical science. Based on the gathered and analyzed data, five emergent themes reflect teachers' experiences. First is The Chameleon Teacher, which has four sub-themes: Changing the Chameleon's Cloak, Morphing into the Future, Basking in a Thermal Embrace, and Painting the Chameleon's Canvas. Second is The Phoenix Within, which has four sub-themes: Nurturing the Phoenix's Wings, Igniting the Phoenix's Flame, Tending to the Phoenix's Feathers, and Creating the Phoenix's Nest.
Third is The Symphony of Knowledge, which has four sub-themes: Harmonizing the Symphony, Orchestrating the Ensemble, Conducting Captivating Melodies, and Striking Chords of Connection. Fourth is The Gardener of Knowledge, which has three sub-themes: Nurturing Time's Garden, Cultivating the Garden of Lifelong Learning, and Exploring the Garden of Experience and Optimism. The fifth theme is Crossing Unfamiliar Territory, which has three sub-themes: Navigating the Rapids of Knowledge, Climbing the Mountain of Adversity, and Walls of Bridge.

1. The Chameleon Teacher

The chameleon teacher symbolizes the non-specialized teachers' adaptive teaching practices in Physical Science. Just as a chameleon changes its colors to blend into its environment, an adaptive teacher adjusts their teaching methods to respond to the diverse needs of their students. They effortlessly switch between different instructional approaches, strategies, and resources, ensuring every student can thrive and learn.

Changing the Chameleon's Cloak

The first sub-theme from the theme, The Chameleon Teacher, is changing the chameleon's cloak. This metaphor reflects the graceful movements of a chameleon as it adjusts its body and color to blend with the environment. Just as a chameleon effortlessly adapts to the changing winds, an out-of-field teacher teaching Physical Science can be adaptive, which further involves being flexible, preparedness, acceptance, coping ability, and perseverance in response to the novel condition they have in the

phenomenon of out-of-field teaching. Here are some shared experiences of these teachers that manifest in changing the chameleon's cloak.

> We need to be flexible teachers, so you need to accept every subject you will have, so I accept the Physical Science.
> Lines 1-4- 001

> We have to accept. That is our duty, being a teacher. So, whatever we are tasked to do. We have to work for it.
> Lines 1-4- 007

The results indicate that one of the adaptive abilities of out-of-field teachers is flexibility, denoting the ease with which their circumstances can be altered. Since they taught a subject outside their expertise, they generally accommodated the novel circumstances they encountered as senior high school educators. Consistent with Buenacosa and Petalla's (2022) research, their adaptability enables out-of-field teachers to overcome challenges in the field. They willingly adapted to the changes, which assisted them in enduring the difficulties they encountered as out-of-field teachers. Furthermore, this assertion supports the research conducted by Lagria (2021), which examined how educators outside their designated field utilized various coping mechanisms to manage their predicament. Additionally, it demonstrates the teachers' ability to adjust to their circumstances. Additionally, it aligns with the findings of Bayani and Guhao (2017), which suggest that instructors develop adaptability when required to instruct subjects beyond their expertise, as this requires them to manage the lesson and circumstances effectively.

Furthermore, this adaptive and flexible ability agrees with the study of Augusto (2019), which recommended that out-of-field teachers possess the creativity and adaptability to handle various tasks while adjusting to the assigned field's degree of difficulty. Similarly, a study by Pacaña et al. (2019) points out that flexibility, as one of the emerging results, minimizes the problem in the condition of out-of-field teaching. Hence, it could be inferred that flexibility embodies a competent and responsible teacher.

One way for the out-of-field teachers to be flexible is through acceptance and preparedness in several aspects of the teaching of Physical Science. It could be gleaned from the results of the original quotes that they readily accept the challenges in handling the aspects of the subject. Furthermore, the challenges make them more prepared in any aspect of teaching that needs to be done prior to the start of the class. They know their weaknesses; thus, these make them more responsive to their status to do their function as educators in the teaching and learning process. A study by Luft et al. (2020) points out that teachers are prepared appropriately if teacher preparation policies are in place in the out-of-field teaching phenomenon.

As part of the adaptive ability, out-of-field teachers have an attitude to cope with and persevere despite their challenges in handling and teaching the subject of physical science. It agrees with the study of Bugwak (2021) about the travails of out-of-field teachers, which has emerging results of coping despite the phenomenon of out-of-field teaching, particularly on subject matter planning, implementation of diverse pedagogical approaches and strategies, participation in professional development, peer mentoring, and assessment/monitoring of students' progress. Moreover, even if they met challenges while teaching the subject, they still persevered in coping with the difficulties they experienced.

To sum up all the descriptions of being adaptive and flexible, it means accepting that they cannot keep everything under control. It means seeing adversity as an opportunity and wanting to try new things, be

adventurous, or improve themselves. Based on the data gathered from the participants, these out-of-field Physical Science teachers manifested the behavior of being adaptable to the harrowing experiences that happened in accepting the novel situation of teaching physical science. They need to see things positively and know they can do anything, which is one of the qualities of having an adaptive teaching practice: it allows them to see the challenges in teaching as an opportunity to learn and improve themselves. The more they see the problem along the process, the more they cope. Thus, being adaptable allows these teachers to improve their ability to teach and manage difficult situations in the teaching and learning process. Therefore, teaching adaptability contributes to the student's progress in learning physical science.

The findings of this study contribute to the growing body of research demonstrating the advantages of adaptability for both students and out-of-field Physical Science instructors. As Collie and Martin (2016) stated, the ability to function effectively and healthily in the workplace is critical for an effective educator. According to additional research, Student self-efficacy was positively correlated with teacher adaptability (Collie et al., 2020). Teachers' Adaptability was positively correlated with perceived autonomy support, which was also positively correlated with organizational commitment and teachers' well-being (Collie et al., 2018; Collie & Martin, 2017).

Morphing into the future

The second sub-theme from the theme of the Chameleon Teacher is morphing into the future. This metaphor describes another adaptive teaching practice reflecting a chameleon blending into a futuristic landscape. It relates to teachers' experiences not in the field on the ability to incorporate new technologies, making it an integral part of enhancing the teaching and learning process. These shared experiences include:

> I showed them a video from YouTube covering the macromolecules. Since they have visual and auditory learning, others have background knowledge, so they can still answer even if it is an individual activity.
> Lines 91-99- 006

> I am using a simulator that looks like it, but I searched it online. PHET simulator. I showed it to them. Then they would say, Oh, it will accelerate if … it is exposed to heat.
> Line 47-53- 010

> If I have something that I have forgotten or do not know anymore, I watch at YouTube, YouTube, then search on Google, and then... My style is if I need help understanding ma'am on a particular topic. Because I am looking for applications, then I will teach more on applications.
> Lines 1-11- 011

Integrating technology in an increasingly digital world becomes crucial for effective teaching, especially in physical science. Out-of-field Physical Science teachers have shown remarkable abilities in embracing new technologies and tools to enhance their pedagogical practices. Through online platforms, simulations, virtual labs, and interactive multimedia, they create immersive learning experiences that engage students and foster scientific curiosity. The practice of downloading and playing YouTube videos in the classroom to enhance students' understanding of the subject matter is consistent with the findings of Co et al. (2021). Guided questions were distributed before the video presentation. Subsequent discussions or sharing occurred having the same findings as the study of Napier et al. (2020) about teaching in-field and out-of-field experiences. However, the in-field teacher shows remarkable ways of incorporating simulations into Physical Science teaching; still, the out-of-field teachers show the integration of technologies to have a convenient way to deliver the lessons well

in Physical Science. In addition to the results of the study of Buenacosa & Petalla (2022), as part of the adaptive practices of out-of-field teachers, it was shared that they used online platforms, specifically YouTube videos needed for their lessons in order for them to understand simply the topics.

More on the incorporation of new technologies, it was shared from the study of Pacaña et al. (2019) that the out-of-field teachers applied this adaptive practice because it makes it convenient for them to deliver the lesson to simplify the concepts, gives deeper explanations and examples in order to be easily thought of by the students. In this way, the out-of-field teachers address the challenges by filling the knowledge gap in content and pedagogy. It agrees with the study of Fyfield (2020) that due to the incidence of teaching non-specialized subjects, these teachers instead use videos and simulations as sources of content knowledge of the subject.

Furthermore, using these technologies provides an exciting and enjoyable way of teaching and learning because of the advanced applications, particularly in the simulations, which are valid with the study of Gloria and Ramnarain (2021), who found that one of the alternative ways of conducting traditional laboratory science experiments is through simulations. Out-of-field Physical Science teachers involved in this study also adopted simulations. The study's findings show that simulations address school safety, make experiments possible when there is no apparatus, save time, improve the accuracy of results, and support independent learning.

Hence, according to Co et al. (2021), technological integration, which typically pertains to information and communication technology (ICT), appeared to be more beneficial when instructing subjects beyond areas of specialization. Furthermore, there is a need for the out-of-field teacher to incorporate technologies, for it is helpful to address the challenge of content and pedagogy of the subject. Grande and Pontrello (2016) also suggest that out-of-field teachers should be given opportunities to use technology for instruction. It is equally essential for them to feel confident using technology effectively to support the teaching and learning process.

Basking on Thermal Embrace

The third sub-theme from the theme, The Chameleon Teacher, is basking on thermal embrace. Here, the chameleon symbolizes the effective utilization of available resources as part of the adaptive practice in the out-of-field teaching phenomenon. Just as a chameleon harnesses the environment's elements, such as sunlight and foliage, to thrive, effective resource utilization involves leveraging existing resources optimally by the out-of-field teachers. It highlights the importance of being resourceful and finding ways to achieve goals with the resources. These shared experiences are:

> Gather the possible resources like books and pdf because I am not majoring in Physical Science. This subject is more about chemistry and physics outside my field, so I am looking for resources. Also, I searched the Curriculum Guide so that before the start of the opening of classes, I already had a proper idea of what possible lessons are in Physical Science.
> Lines 1-14- 002

> So, reading a lot of references, internet surfing for information and there are updates like, when we talk about studies, yes. So, there were things we knew before that are not applicable now. So that is why we also need to adopt those studies.
> Lines 25-33- 007

Out-of-field Physical Science teachers can utilize various digital resources to supplement their teaching. These out-of-field teachers show an attitude of being resourceful enough and take the initiative to utilize resources to cope with the challenges, particularly on the part of content, pedagogy, and student issues

in the classroom. These resources include books, e-books, scoresheets, modules, scientific articles, and educational websites that empower them to stay updated with current research and advancements in scientific fields. They utilize these resources to confront the difficulties presented by out-of-field teaching, which is more evidence of this study's epistemological philosophy that these experiences improved the current trend of value and quality of such teaching-learning process.

Being resourceful amidst the out-of-field teaching phenomenon has several related studies that supported a positive emerging result. Consistency in being a resourceful educator throughout one's teaching career consistently leads to professional development and growth, according to Baldoni (2010), as cited by Lopez et al. (2022). Further, Briggs (2015) defined resourcefulness as challenging one's and others' assumptions, welcoming challenges and disagreements, and acknowledging the intrinsic worth of discomfort. Even in out-of-field teaching, these resourceful teachers develop a cheerful disposition (Arendain & Limpot, 2022).

Furthermore, being resourceful is an adaptive practice that positively impacts teaching and learning. Similar to the findings of Bayani and Guhao (2017), the enhancement of teaching abilities was achieved through the utilization of outdated lesson plans, internet research, and the consistent perusal of books containing practical exercise suggestions. The same benefit can be drawn from the research of Co et al. (2021): the out-of-field teachers became more resourceful due to the challenging experiences because they viewed them as opportunities to gain new knowledge. Moreover, findings of the study from Montero et al. (2022) show that resourcefulness helps out-of-field teachers survive even if the school administration cannot cater to all their needs.

Additionally, resourcefulness also emerges as one of the experiences of non-specialty educators from the study of Evardo Jr. & Abina (2023), in which they use available resources such as articles and books at hand or online to assist or guide them with the proper content and pedagogy skills in teaching a subject outside the area of expertise. Similarly, based on the study of Abaño et al. (2021), out-of-field teachers show being resourceful by surfing the internet to study, reading intensively, learning independently, and coping with the teaching difficulties they face.

Painting the Chameleon's Canvas

The fourth sub-theme from the theme of the chameleon teacher is painting the chameleon's canvas. This metaphor represents another adaptive practice of being in the out-of-field, which relates to encouraging creativity and innovation in the teaching and learning process. Similar to a chameleon's painting vibrant colors across a blank canvas, fostering creativity and innovation involves exploring new possibilities, ideas, and approaches. It encourages the students to think outside the box and create something uniquely transformative and impactful. Here are some shared experiences of out-of-field Physical Science teachers who manifest in painting the chameleon's canvas.

> The quarter exam was even more enjoyable, Ma'am because I made the questions like an entrance exam, which is more on analysis and application. For example, I will make it situational, Ma'am, and its pure understanding.
> Lines 80-88- 004

> I do not give a feeding type of exam, at least something that they will think of, but in a way, I have to measure their intelligence kind of example which is appropriate for their level, which is appropriate for their strand. OK, because as a teacher, you must think of their level.
> Lines 31-40- 005

It could be gleaned from the original quotes of the results that they thought of letting their students learn independently and explore their learning. Just as the out-of-field teacher of this study encourages student-led initiatives and designs open-ended assignments, it also associates with the findings of Co et al. (2021), where out-of-field teachers employ active and participatory methods like group activity, reporting, and board work. By embracing creativity, these teachers empower their students to think outside the box and develop problem-solving skills to develop a passion for learning Physical Science.

In connection with the mentioned independent learning, it is associated with the study of Arroco (2021) about the importance of inquiry-based learning, which is included in developing scientifically literate learning. Furthermore, it is pertinent to the research conducted by Harlen (2014), which underscores the significance of a learner-centered approach to education that affords students the chance to cultivate inquiry capabilities such as formulating inquiries, organizing investigations, procuring evidence through observation of sources, analyzing, interpreting, elaborating, communicating, reflecting, and assessing. Thus, there is a need for out-of-field teachers to let the students emerge with meaningful strategies in order for them to share knowledge with students in the 21st century (Arendain & Limpot, 2022).

Additionally, based on the emerging results of the theme, out-of-field physical science teachers present these experiences to involve the students in developing critical thinking. These teachers give authentic learning by letting their students be immersed in challenging learning experiences, such as answering an essay activity, solving situational problems, and other strategies where students could think critically about the lessons to be delivered by the out-of-field teachers. Mokiwa and Nkopodi's (2014) study shows that critical thinking may be developed through independent learning, particularly inquiry-based learning.

Hence, adapting through innovation and creativity is essential for out-of-field teachers. Crisan and Hobbs (2019) posit that outside-specialty educators who adopt innovative approaches have a greater chance of effectively challenging dominant subject pedagogies that sustain conventional and ineffectual teaching methodologies.

2. The Phoenix Within

This metaphor embodies the transformative power of resilience. Physical Science majors may have a solid foundation in their subject area, but out-of-field Physical Science teachers face unique experiences and obstacles in the classroom. In this theme, the lived experiences of out-of-field physical science teachers are described as developing a resilient mindset, prioritizing emotional well-being, and creating a caring and supportive classroom environment for their students.

Nurturing the Phoenix's Wings

The first sub-theme under the theme The Phoenix Within is nurturing the Phoenix's wings. This metaphor relates to fostering strategies to handle challenges and adversity. Just as the phoenix spreads its wings and rises above obstacles, out-of-field teachers are also experienced in developing strategies to address the challenges in the out-of-teaching phenomenon. Some of these experiences are:

> I must read… read… to study… for the upcoming in preparation for various subjects, the physical science. I have to read during the night for me to be able to remind you of this and refresh you.
> Lines 1-7- 005

> I look for a way, like, I will search quickly, give an activity, search quickly, then discuss with them, so I am just looking for a way, Ma'am, so they can answer the questions.
> Lines 21-27- 011

Based on the results, they could simplify the content and instruction of the delivery of Physical Science subjects, which agrees with the study of Fyfield (2020) that out-of-field teachers were adding detail and simplifying concepts where needed to be easily understood by their students. Similarly, in a study by Strang (2021), simplified pedagogic methods were used to address the challenges of the out-of-field teaching phenomenon.

Out-of-field Physical Science teachers also engage in several personal initiatives and techniques like conducting personal rehearsals in delivering the lesson and utilizing available resources to enhance their subject knowledge. This specific experience is supported by Rebucas & Dizon (2018), in which they find time to study and master it even if they need to extend extra time to cope with the challenges, especially the subject not in their field of specialization. By being proactive and resourceful, these teachers build confidence and develop strategies to navigate through challenges effectively. It could be gleaned from the verbally shared experiences that out-of-field Physical Science teachers underwent several challenges in the learning and teaching process. However, it was evident from the direct quotes on how they respond positively to those challenges. They spontaneously came up with several strategies to address the difficult situations they were in. Moreover, reading the original quotes of these experiences suggests they have the endurance to stand amidst their challenges.

Igniting the Phoenix's Flame

This metaphor relates to cultivating a positive mindset and self-belief. Just as fueling the fiery spirit of the phoenix within to burn brightly, out-of-field teachers have this inner attitude of having a positive mindset and self-belief necessary for the success of the method of instruction and the learning process.

> I have experienced a student asking me, and I do not know the answer. So, I told the student, "I am not sure if my answer is correct, so I will give you the details at the next meeting," then I told the student, "I am just cautious with the information so that you cannot carry it as you go to college that wrong information.
> Lines 145-155- 001

> I caught a student writing on his palm; the answer was and then. Well, he does not know that I was there. So, I said, "What is that?" I asked him with a friendly, friendly approach. Moreover, they were shocked. So, I told them to erase that because that is what they are doing, which is not good. You are making your classmates dependent and not teaching them the right thing.
> Lines 67-79- 007

One of the qualities of out-of-field teachers having a positive mindset is honesty, which is emphasized in the study results. Out-of-field Physical Science teachers have a good attitude toward accepting and admitting their weaknesses to students. They have experience teaching the subject of physical science, but in the middle of their discussion with the class, they need to learn more about the connecting concepts of the lesson. However, these teachers had their strategy to address the situation so that students maintained their trust in their teacher. This experience of the teachers supports the study of Rebucas & Dizon (2020), which states that non-specialized teachers are honest with the whole class if they have yet to learn about the questions from the students. They do not pretend but rather accept student's ideas and appreciate them for sharing. It also agrees with the study of Buenacosa and Petalla (2022), who tell their students to address the problem by researching the specific gap in the subject's content. In addition, they find a positive excuse, like letting their students understand why they cannot answer some of the students' concerns right away.

With the further emerging results, the value of honesty was being integrated to hone a positive mindset toward the students of out-of-field teachers. They instill in the minds of their students the value of honesty by being strict during exams, specifically on the issue of cheating. Through this, the out-of-field teachers practice being consistent in being true to themselves and their students.

Hence, this finding implies that out-of-field teachers should have a positive mindset to be resilient to the challenges of teaching outside the area of expertise. This finding is consistent with Co et al.'s (2021) finding that they approach challenges positively to be involved and make a difference in the school. Moreover, it bears the same finding as Du Plessis et al. (2015) that displaying a cheerful disposition toward out-of-field subjects may contribute to the management of being in control of the challenges and putting enthusiasm in the field of the subject they are teaching.

Tending to the Phoenix's Feathers

This metaphor relates to the attitude of out-of-field teachers in prioritizing emotional well-being. Just as they care for the delicate feathers of the phoenix, ensuring they remain vibrant and resilient even in the face of storms, out-of-field teachers are considerate and passionate about the emotional well-being of their students to encourage them to learn the concepts of Physical science. Some of the shared experiences of these teachers are:

> So, in lesson 1, we did an assessment and a summative; I put them by group, "Oh, so answer this, it is just similar to the others; I will not be too strict, Ma'am. It is like you just have to prove that they learned it; it is up to them later or after the exam; as long as you let them pass, you have proof in yourself that "ahh, they already understood; they just did not understand it before. Lines 197-209- 004

> It is adorable, Ma'am, it is excellent, the students' feelings if the teacher is approachable, Ma'am, in the day-to-day thing. Then, you can answer their simple questions, that is all.
> Lines 80-86- 012

Out-of-field Physical Science teachers understand the importance of prioritizing their students' emotional well-being and needs. They recognize that each student has unique learning styles, interests, and challenges. These educators establish a secure and all-encompassing classroom setting that encourages students to freely articulate their thoughts and seek assistance. They actively listen to their students, provide individualized attention, and foster a sense of belonging. Furthermore, based on the results, they let themselves feel approachable on the part of the students to add to the thought of being comfortable in expressing students' concern towards the subject of physical science.

Additionally, these teachers showed several attitudes towards their students, such as being passionate, considerate, and appreciative of the welfare of their students. Furthermore, they showed empathy for learners' struggles in learning the concepts of Physical Science. This result was supported by the study of Bayani & Guhao (2017), which found that being passionate contributes to enthusiasm in managing the well-being of the students. Similarly, the result also aligns with the findings of Montero et al. (2022) that out-of-field teachers manage to sustain their passion through a resilient mindset amidst the challenges of out-of-field teaching. The same results were expressed by the out-of-field teachers from the study of Lagria (2021). They motivate themselves to withstand the challenges by demonstrating enthusiasm and considering alternative approaches to acquire sufficient knowledge.

Creating the Phoenix's Nest

This metaphor refers to another way of being resilient to promote a supportive environment in physical science's teaching and learning process. Just as building a nurturing nest for the phoenix to thrive,

where its presence is cherished, and a community of like-minded individuals nurtures its growth, out-of-field teachers often promote an environment conducive to a positive learning outcome among students. Some of the shared experiences are:

> I will give a group activity in which they are more confident to ask their classmates, but their classmates need to know. My strategy is to go around to the group and ask them, and they open up their ideas little by little.
> Lines 66-75- 008

> Give them time for their next interaction because they are easier to handle, there is no pressure, and the class is more interactive. Your discussion would be practical in that case.
> Lines 87-93- 012

Out-of-field Physical Science teachers created and cared for a supportive classroom environment. They understand that fostering positive teacher-student relationships can significantly impact students' learning outcomes and emotional well-being. These teachers actively engage with their students and encourage open communication. By incorporating hands-on activities and interactive teaching methods, out-of-field Physical Science teachers make the subject matter more relatable and accessible to their students. They let their students engage in learning activities conducive to the teaching and learning process of the subject, where effective communication is present. Thus, it creates a nurturing atmosphere where students feel supported, encouraged, and motivated to explore and excel in their learning journey.

Specific to the description of letting the students feel supported during the class sessions, it could be gleaned from the original quotes that out-of-field teachers let their students feel that they are one team along the learning process. It was shown that amidst their gap in the subject content, they have managed to have a strategy such as letting the student do their learning and doing research by the out-of-field teacher, then consolidating all the findings. In this way, the students may be encouraged and feel supported in the classroom environment.

Promoting a supportive environment was emphasized in the study of Napier et al. (2020), where out-of-field teachers use modeling and argumentation as well as engaging the students in the investigations of the subject matter, and this strategy positively supported the students' learning. Similarly, the study of Bugwak (2021) also promotes a supportive environment by employing the participatory approach to the students and using other strategies and approaches that best suit the students.

3. The Symphony of Knowledge

Another emerging theme is the Symphony of Knowledge, which represents the harmonious collaboration and engagement among students and teachers in learning. Like the different instruments in an orchestra, out-of-field teachers bring their unique strengths, talents, and perspectives, which blend to create a beautiful symphony of knowledge. They orchestrate this collaborative learning experience, guiding and facilitating the interactions, ensuring that every voice is heard and valued.

Harmonizing the Symphony

This metaphor promotes peer mentoring as the intricate interplay of musical instruments, where each musician supports and guides one another, creating a harmonious symphony of knowledge and growth. Some of these shared experiences are:

> The good thing was at the school where I was assigned, I had my relatives... and that relative that's his forte, so I underwent a tutorial, so, it is peer mentoring, like every lesson, before I go to school, I went to him to let him teach me first.
> Lines 9-17- 003

> There is a moment, Ma'am, that it is OK for me to let them ask their classmates what they know. Some of them know the concept, so I will let them look for someone for them to ask.
> Lines 127-133- 008

Based on the results, out-of-field Physical Science teachers can leverage peer mentoring and support to enhance collaborative learning experiences. Teachers created an inclusive learning environment by encouraging students to collaborate, share their knowledge, and support one another. This approach allows students to feel more comfortable seeking help from their peers and fosters a sense of community within the classroom. Out-of-field Physical Science teachers shared their own experiences of implementing peer mentoring and the positive impact they have observed on student engagement and learning outcomes.

In addition, while these teachers employed this as one strategy for the students to learn, as supported in a study, this could also be interpreted as one of the modes for them to ask for technical assistance from their co-teachers who are specialized in Physical Science (Arendain & Limpot, 2022) this is also one of the means to manage the obstacles of out-of-field Physical Science teachers. They need guidance from a knowledgeable other, such as a specialized physical science teacher, to solve common weaknesses of being out-of-field, which is aligned with the study of Augusto (2019), who found that one way to cope with the challenge is by asking for help and a series of consultations with a more knowledgeable other. Also, it was experienced and observed by the out-of-field teachers from the study of Pacaña et al. (2019) peer teaching. They often ask specialized teachers and experts for assistance whenever they are confused.

Moreover, according to Amineh & Asl (2015), through the experiences in out-of-field teaching and social involvement from peer teachers, learning would continue to progress from the present level to a higher level, which would approximate the capacity of educators to devise effective teaching strategies. In addition, it also emerged from other studies that out-of-field teachers consult their colleagues who have taught the subject for many years and believe that they can also learn from others (Bugwak, 2021; Lagria, 2021; Montero et al., 2022)

Hence, this implies that including peer mentoring is beneficial on the journey of an out-of-field teacher. The findings of Rahayu and Osman (2022) show that it would be conducive on their part to gradually acquire skills that are increasingly central to practice through learning from professionals and colleagues.

Orchestrating the Ensemble

This metaphor refers to fostering teamwork and cooperation. Just like a symphony conductor guiding an orchestra, bringing together diverse talents, and blending them into a cohesive and magnificent performance, the out-of-field Physical Science teacher can let the students collaborate to discover the

concepts of Physical Science unknown due to the out-of-field teaching phenomenon. Some of these shared experiences are:

> Ma'am, we also solicited ideas from other teachers who teach physical science, like "You do this topic, you do that, that... we even did a departmental exam.
> Lines 76-83- 003

> Some students ask questions during class, and then... of course, Ma'am, on my part, I am just a beginner; I will cater to their questions at the next meeting. So, I will tell them, Ma'am, that they will do their research, and I will also do my research. So, then, we will consolidate it.
> Lines 63-72- 006

Based on the result from the original quotes, collaboration, and teamwork were shown by both out-of-field and in-field teachers in addressing the challenges with the content knowledge and pedagogical knowledge of the subject. This finding is in line with the findings of Abaño et al. (2021), in which teachers work together in teams to enhance learning procedures and outcomes. Other studies have also employed teacher collaboration to address the challenge, particularly in knowledge and pedagogical content (Bayani & Guhao, 2017; Lagria, 2021). It was discovered that their co-participation predicts the growth of teachers' expertise. Furthermore, they pointed out that teamwork between workers is needed to promote the integration of individual teachers' expertise and approaches, as no educator can achieve these goals without at least some feedback from others.

Regarding collaboration among students, they were provided with interactive activities by the out-of-field teachers to actively engage with the subject matter and collaborate with their peers. These teachers have emphasized to their students the value of collaboration in engaging the topics in Physical Science. They have employed the essence of teamwork among students and between students and teachers in seeking answers to the knowledge gap brought about by the out-of-field teaching phenomenon. These activities encourage students to collaborate, exchange ideas, and develop critical thinking skills.

Hence, the finding about teamwork is an essential and effective strategy for out-of-field Physical Science teachers in bridging the gap between content and pedagogy. Based on the data gathered, letting the students cooperatively do the work and search for unresolved content issues benefits both the teacher and students. There is a simultaneous way of learning each one of them, such that both will search for the content and receive the necessary learning, which also creates a harmonious relationship between teacher and student, for they would feel they are in a team in solving problems (Bajar et al., 2021) and allows the student to practice independent learning and apply it soon after graduation.

Conducting Captivating Melodies

This metaphor refers to implementing engaging strategies that the out-of-field teachers have employed while teaching and learning Physical Science. Just as a skilled conductor leading a symphony captured the attention and hearts of the audience by captivating and crafting melodies to inspire and ignite curiosity, out-of-field teachers could implement strategies to make the teaching and learning process of Physical Science more engaging to the students. Here are some of the shared experiences.

> Through games and video clips usually, and in my experience, they are more engaged with games; my games are always in a group... and whose group can solve first, there is a bonus; they also have an incentive, not purely because you are just playing games. After all, they tend to be more motivated with incentives in the game. Then, aside from that, the video clip, that funny video clip, not just a pure lecture-type video clip.

Lines 133-149- 003

I really cannot forget about the award, Ma'am; they will be happy with that, Ma'am; there is an award system, Ma'am, like if it is complete attendance, they have an additional point, plus if they performed well in the past exam, if they did perfect, there is also food, Ma'am. "We will have a "budol" fight later because you did well and passed the exam".
Line 65-79- 012

Based on the gathered data, out-of-field physical science teachers applied several strategies to motivate students to learn physical science concepts. One of these is the group activities done through games, which are engaging for the students because they involve a fun learning experience, thus avoiding boredom throughout the teaching and learning process. The findings of Bayani and Guhao (2017) indicate that out-of-field instructors employ engaging strategies to capture students' attention during their lessons, enhancing their interest in the subject matter and contributing to improved academic performance. Additionally, it was stated that the exercises encompassed pedagogical practices from the classroom, including role play, dramatization, and other forms of group dynamics.

Another technique is the inclusion of positive reinforcement or the award system, where they will give something to students to reward them for reaching a specific goal. This remains effective, for it motivates them to learn physical science concepts. Integrating differentiated activities was also done by out-of-field Physical Science teachers to cater to varied types of learners and address their individual needs, which is another way to be more engaged in learning the subject.
Engaging and motivating learners can be particularly challenging for out-of-field Physical Science teachers, as students may have diverse interests and different levels of prior knowledge. Teachers employed strategies like gamification, multimedia resources, real-world applications, engaging oral recitations, and several unique activities to address this. Studies have shown experiences from out-of-field teachers in employing engaging activities to motivate the students along the process (Buenacosa & Petalla, 2022; Lopez et al., 2022).

Striking Chords of Connection
This metaphor refers to using icebreakers and techniques to motivate the students throughout the teaching and learning process. Just as the initial notes played by musicians in an ensemble, striking chords break down barriers and create a sense of connection, setting the stage for a harmonious and collaborative symphony, out-of-field teachers utilized ice breakers and unique techniques to avoid boredom in every class session in the Physical Science subject. Some of the shared experiences are:

Their attention, because I am already counting, it is up to me, significantly if they have already fallen asleep during the lecture like it is a holy hour... that is the time I will say, arrange your chairs, sit properly, then suddenly I will say "1!". Because they are used to quizzes and activities, I count so that it would catch their attention during lectures.
Lines 158-168- 003

And then, in the class, they mostly laugh, so they do not feel confused because I taught the subject in such a way that I was joking. So they feel free of the pressure of having a physical science subject.
Lines 144-151- 005

Based on the results of the original quotes, out-of-field physical science teachers are integrating icebreaker tools to avoid boredom throughout class sessions. Some of these techniques include giving

appropriate jokes, alert systems, and other spontaneous ways for teachers to make their students stay alive during the teaching and learning process.

In line with the findings of Bayani and Guhao's (2017) study, it is suggested that to be an effective educator, one must exhibit enthusiasm. Extending enthusiasm to motivate students to participate and stimulate their learning of the subject matter is a significant responsibility placed on out-of-field instructors, who should infuse the classroom with activity and delight. Furthermore, research indicates that icebreakers benefit from acquiring knowledge and instruction. An investigation by Mahmud et al. (2023) revealed that incorporating ice-breaking activities into the curriculum would facilitate student engagement, prevent monotony, foster a positive learning environment, and increase motivation and interest in learning. Findings also from action research conducted by Giraldo (2021) state that students reported feeling more comfortable in the group, engaging in more interactions, and perceiving a positive change compared to the previous session.
Hence, integrating icebreakers can improve student performance and classroom behavior. However, this kind of integration should be appropriately handled with caution to emphasize the giving of appropriate jokes, as one of the experiences of out-of-field teachers in this study. As supported and suggested by Omar's study (2019), icebreakers should be relevant, friendly, light, short, and engaging.

4. The Gardener of Knowledge

This metaphor depicts the teacher as a diligent gardener who cultivates the growth of their students and themselves. Just as a gardener carefully tends to their plants, the out-of-field teacher manages their time effectively, nurturing their intellectual and personal development brought about by the out-of-field teaching.

Nurturing Time's Garden
This metaphor refers to employing effective time utilization techniques like a skilled gardener sowing the seeds of productivity. This theme focuses on the techniques of out-of-field physical science teachers facing unique challenges in managing their classroom time effectively. These teachers often bring diverse perspectives and skill sets to their teaching practice, which can be advantageous. Some of the shared experiences are:

> In terms of time management, Ma'am, as much as possible, I will come to my classes on time. And then my students, as much as possible, when it comes to activities, I also make sure that even if it would take longer, for example, ten to twenty minutes, I also ensure they have learned the activities.
> Lines 184-194-006

> They can also answer it and are more interested in looking at the front because of a time limit. "It only takes five seconds for you to raise the board; if you cannot raise it for five seconds, your answer will not be counted. So, they will have a competition to see who will be the first; they will strive hard.
> Line 116-125- 010

Based on the results, some out-of-field Physical Science teachers needed help managing class time. However, some also have their technique for managing time properly, which involves strict implementation of the time allocated for submitting outputs and the other parts of the lesson. Additionally, one good attitude, which shows being in advance before the start of the schedule, was very effective in helping them practice time management in class, as supported by the study of Azarias et al. (2019), which resulted in similar findings and pointed out that if the time allotted for the class is spent

well, the students could acquire the desired competencies and skills. Strang (2021) also suggested that class time should be utilized appropriately to ensure that all objectives or learning competencies are covered and achieved.

Cultivating the Garden of Lifelong Learning

Just as a gardener who lovingly tends to have a vibrant and ever-growing garden, continuously enriching the soil of knowledge and nurturing the diverse flowers of wisdom that bloom throughout one's journey, out-of-field teachers let the students be immersed in the concepts of Physical Science through contextualization which provides more authentic learning. Here are some of the shared experiences:

> The first thing I did, Ma'am, was define the concept. I gave examples; then, if they still did not even know the examples that fit that concept because the students still did not understand, I translated them into real-life experiences so they could understand.
> Line 36-46- 010

> I always reach a point where I can relate the topic to life experiences. It is much easier for them to… to cope… No, to understand, to relate the concept, yes, if you always relate it to life.
> Lines 137-143-005

The application for authentic learning extends beyond the classroom, and teachers need to emphasize the importance of lifelong learning to their students. One of this kind of learning is through the integration of the lessons into real-life situations. This passion drives them to widen their imagination and think divergently about possible contextualization to contribute to the students' lifelong learning. As Gebre and Polman (2019) pointed out, appropriating knowledge to lifelong learning requires contextualization by utilizing issues from their daily lives as a valuable learning resource and discarding a static view of context. Furthermore, Picardal and Sanchez (2022) concluded that incorporating contextualization, localization, and indigenization into the nation's K–12 basic education system is critical to providing students with meaningful scientific learning experiences. Moreover, research by Buck et al. (2014) indicates that incorporating contextualized elements into science education enhances students' comprehension of empirical evidence.

Exploring the Garden of Experience and Optimism

This metaphor emphasizes new knowledge and skills through experiences and optimism from the out-of-field teaching phenomenon. In addition to fostering students' growth through lifelong learning, out-of-field Physical Science teachers have explored their learning out of their experience in the journey of out-of-field teaching and learning process. Here are some of the shared experiences.

> I gained many benefits. It helped me activate my neurons (laugh)... so it would not rust. At least I can refresh the topics every year. It also helped me with my professional growth... uhhmm... as well as personally... maybe I can use it in the future because of what I have been teaching; I can also use... whatever my plan in life I will take, so that is why it has been exceptional in many ways.
> Lines 160-173- 001

> That is it, Ma'am, those are the great benefits; not only did it give me challenges, it helped me, and at the same time, I was able to fulfill my purpose as a teacher to them; that is it... strategies, and evaluations that I can give to them.
> Lines 129-137- 012

Based on the shared experiences of out-of-field Physical Science teachers, the whole experience of teaching the subject allowed them to grow professionally. It gained a lot of learnings, insights, content knowledge, pedagogical knowledge, fulfillment, and satisfaction. Furthermore, it makes them more resilient to the challenges of out-of-field phenomena. Thus, this experience builds a strong foundation for them to be effective and efficient teachers. They have this mindset that they already own Physical Science and are willing to teach the subject again in the future.

The learning and other advantages that out-of-field physical science teachers have from the experiences are supported by several studies that focus on the lived experiences of out-of-field teachers. It conforms to the findings of Abaño et al. (2021) that they maintained equilibrium in teaching over time and benefited from the experience. According to the study of Arendain & Limpot (2022) and Montero et al. (2022), their experiences in out-of-field teaching give additional knowledge. It was further presented from their findings that it paves the way for them to discover their new identity and help their future as a teacher.

Optimism also contributes to this emergent sub-theme. The out-of-field physical science teachers have shown a positive attitude towards their situation, which has helped them deal with the difficulties brought by the out-of-field teaching phenomenon. These findings resonate with the study of Buenacosa & Petalla (2022) and Co et al. (2021) that despite the situation, the experience of these out-of-field teachers has helped them become more optimistic and embrace positivity along the process.

In addition to optimism, the out-of-field Physical Science teachers have gained fulfillment. They could now understand their purpose in handling a subject beyond their specialization, which is aligned with the findings of the study conducted by Augusto (2019) that amid the struggle of out-of-field teaching, some out-of-field teachers still feel and find fulfillment and satisfaction in dealing with the challenges of the subject.

5. Crossing Unfamiliar Territory

It is reflected in the saying, "You cannot give something that you do not have," which relates to the challenges of out-of-field Physical Science teachers in teaching a subject not in their field of specialization. The term unfamiliar territory, which links to teaching a subject outside their specialization, contributes to these teachers' challenges.

Navigating the Rapids of Knowledge

This metaphor reflects on the challenges of out-of-field Physical Science teachers in the curriculum and instruction, which can be seen as a river flowing with different currents and rapids. Like an adventurer maneuvering through challenging waters, out-of-field teachers need help understanding the concepts of Physical Science and the pedagogy and skills in teaching the subject. Here are the shared experiences that reflect the challenges in the curriculum and instruction.

> The curriculum guide makes me weak, but of course, at least, we are guided by it... performance task, as well as the learning competency, but it is not even feasible for me because... the way the student's uptake is different from the allotted time... in reality…
> Lines 33-42- 003

> It is so confusing, Ma'am. Moreover, yes, it is not connected. You are like, OK, what is the connection to the previous topic? In our lesson planning, we connect the previous topic with the current one, and then our students need clarification; that is the struggle in Physical Science.
> Lines 35-45- 008

One of the challenges that out-of-field Physical Science teachers experience is the complexities of the curriculum guide. As the primary guide for the teachers in DepEd to cover the learning competencies and objectives, it should lead the way for the proper topics to be covered throughout the semester. However, it could be gleaned from the emerging results that out-of-field teachers experienced problems managing the topics with the said guide. One of the problems is the need for a proper sequence of topics, in which some need continuity to the next topic on the guide list. Furthermore, they need help with the very long coverage of the competencies in the guide. The list should be shorter for the allotted one semester only. Thus, it is tough for them to budget the lessons intended to be arranged ahead of time for the actual delivery of the lessons.

In addition to the issues discovered with the curriculum guide, other discoveries have also been made, such as the need for more knowledge regarding the topic and the inadequate management of the students. In addition, it encompasses unpreparedness and any other deficiencies associated with the subject matter of Physical Science. As stated in the research conducted by Orbe, Espinosa, and Datukan (2018), they agree with the findings that they have problematic concerns regarding teachers' content, pedagogy, and assessment. These concerns are specifically related to their challenges, which include instruction-related factors, teacher competence, in-service training sufficiency, job satisfaction, support from upper management, laboratory adequacy, school resources, and assessment tools.

It also follows the same pattern of results from the study that was conducted by Co et al. (2021), which found that these challenges are primarily caused by limited subject matter knowledge and influence the teacher's pedagogical content knowledge, which is essential in the preparation and actual teaching of the subject matter. In order to ensure that students can learn, teachers must devote a significant amount of time and effort to reading the subject's content and carefully planned activities that are appropriate for the student's abilities. Furthermore, according to the findings of the study conducted by Apau (2022), it was discovered that they had a more difficult time adjusting to the demands of their classrooms. They also needed help preparing instructional lessons, conducting assessments, motivating and managing their students, and engaging in other classroom activities.

Climbing the Mountain of Adversity

This metaphor refers to the personal struggles of out-of-field teachers in dealing with subjects in physical science. It can be likened to a steep and treacherous mountain. Each challenge represents a problematic ascent, testing strength, resilience, and determination. Just as climbers face obstacles step by step, out-of-field Physical Science teachers also face personal struggles from the out-of-field teaching phenomenon. The shared experiences include:

> Delivery of the content... "ahhh" to be honest, Ma'am. For every topic I would be discussing and delivering at every meeting, I felt nervous (laugh). Why nervous? Because even though I am already a teacher, it is not a guarantee that I am a master of the subject because it is not my field.
> Lines 28-37- 001

> My main challenge is whether I, as a teacher, am effective in teaching them (learners) too. I am nervous if it is enough... I... It is a good thing, too, because being a teacher is hard to be overconfident.
> Lines 148-156- 002

There are several personal struggles that the out-of-field Physical Science teacher has during the teaching and learning process. Because they are not used to the situation, they tend to struggle to manage themselves along the process. Some of these challenges are but are not limited to personal

struggles, inability to deal with troubleshooting, unsettledness, pressure, apprehension, frustrations, anxiety, and confusion.

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These difficulties support the conclusions drawn by Bayani and Guhao (2017), in which non-specialty educators disclosed that feelings of frustration and insecurity had permeated their professional conduct. Based on the results, they expressed anxiety about teaching the subject and a fear of making errors when explaining the topics. Because of these concerns, they were under tremendous stress. They also disclosed that their experiences had left them frustrated and ineffective as subject instructors. Another frustrating aspect is pitying the students for gaining no knowledge from their instructors due to their incompetence, which is further supported by Abaño et al. (2021), which examined the difficulties encountered by out-of-field teachers, including managing anxiety and depression.

Walls of Bridge

This metaphor refers to the limitations of facilities, which can be seen as bridges connecting individuals to various opportunities. Like sturdy bridges spanning gaps and obstacles, supposedly well-maintained facilities will provide the necessary infrastructure for individuals to cross over from limitations to possibilities.

However, as with the case of the out-of-field Physical Science teachers, this study shows the original quotes that the teachers need help utilizing the school facilities necessary to achieve authentic learning. It involved the mismanagement and inadequacy of the laboratory apparatus and no proper training in handling it. This finding made a wall to the bridge of learning and showed the hostile experience of out-of-field teaching in Physical Science. Some of the shared experiences include:

> The person in charge of the laboratory is only sometimes around because he is also teaching. Another problem, Ma'am, is that we must bring materials, and then the teachers move around. The proper way is that if we have time for that, only students will come to that room because it has been set up in advance.
> Lines 97-106- 004

> The laboratory still cannot be established. We do not have a place to conduct an experiment where we can say that the students are safe.
> Lines 114-118- 008

Emphasizing more on the specific results, one of the shared experiences by the out-of-field teachers that limits them to giving authentic learning to the students is the lack of buildings for the laboratories and the apparatuses to be used for experiments. Some participants further shared that they have the laboratories; however, they still cannot be utilized due to mismanagement of the schedule and the student's lack of proper training to handle the apparatus.

The results agree with the research by Lopez et al. (2022), which found that out-of-field teachers reported that their schools needed more instructional materials and equipment that corresponded to the various teaching methodologies, techniques, and strategies. It is further supported by the study of Diate & Mordeno (2021) that the highlighted problems by the out-of-field teachers include the

insufficiency of physics laboratory instruments and rooms, which was pointed out as their primary concern.

Moreover, another specific finding about facilities is that there is a need to have proper training in handling the laboratory rooms, equipment, and materials for experiments, which further supported by the study of Napier et al. (2020), which found that instructional safety was rarely reviewed, and there were sporadic safety concerns in the classroom due to the unfamiliarity of non-specialty instructors with laboratory equipment.

CONCLUSION

The experiences of out-of-field Physical Science teachers positively and negatively impact the teaching and learning process of Physical Science subjects. The attitude of adaptability and flexibility minimizes the problem in the out-of-field teaching phenomenon, thereby contributing to the student's progress in learning Physical Science. Incorporating new technologies, such as online platforms and simulations, is a convenient way to deliver the lessons, simplify the concepts, and give deeper explanations and examples.

Experiences involving fostering strategies spontaneously promoted endurance to stand amidst the challenges. Moreover, having a positive mindset, particularly the value of honesty, passion, consideration, and appreciation of the welfare of the students among Physical Science teachers, is an essential means to be resilient.

They need to address the struggles, particularly on the curriculum guide and insufficient content knowledge and pedagogy, to lessen their discomfort in handling the subject. It is also concluded that out-of-field physical science teachers need to resolve their struggles, such as apprehensions, frustrations, anxiety, confusion, and feeling pressured due to teacher incompetence they feel in the phenomenon. Out-field Physical Science teachers' positive and negative experiences allowed them to grow professionally and emphasized optimism.

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