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To cite this article:

Rebucas, E. (2022). Experiences of science teachers teaching non–science subjects: A phenomenology study. *International Journal on Studies in Education (IJonSE), 4*(2), 130-140. https://doi.org/10.46328/ijonse.73

International Journal on Studies in Education

2022, Vol. 4, No. 2, 130-140 https://doi.org/10.46328/ijonse.73

Experiences of Science Teachers Teaching Non–science Subjects: A Phenomenology Study

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Article Info

Article History

Received:
31 July 2021
Accepted:
22 March 2022

Keywords

Challenges
Coping mechanism
Non–science subject
Phenomenology

Abstract

The challenge of unimpressive performance in science subjects is worldwide as revealed by various international research investigation. The increasing rate of low academic achievement and failures in science subjects in schools may significantly impact both individual students whose target was to proceed with tertiary education and seek a lifetime opportunity. However, all of these aims may be affected by the unimpressive performance of students in science subjects. The aim of this study was to describe the experiences of science teachers who encountered problems and challenges in teaching non–science subjects. The study utilized the qualitative phenomenological design with two data gathering techniques, the in-depth interview and focus group discussion. There were 14 participants in this study who were science teachers from secondary schools in Montevista district, Davao de Oro Division, Mindanao, Philippines. Data triangulation was addressed through generating data from various sources to gain a fuller perspective of the study. There (3) essential themes were generated on the experiences of teachers from teaching Non–science subjects. As to the result, the study further recommends on the revisitation on the hiring policy, plans and programs for teachers particularly the need for teacher's alignment of subject as to what teachers' specialization or subject field of expertise.

Introduction

The challenge of unimpressive performance in science subjects is worldwide, as revealed by various international research investigations. The increasing rate of low academic achievement and failures in science subjects in schools may significantly impact both individual students whose target was to proceed with tertiary education and seek a lifetime opportunity. However, all of these aims may be affected by students' unimpressive performance in science subjects, which may influence the country, whose point is to have experts in different science fields like medicine, business, communication, and industrial development to accomplish its technological and development goals.

Similarly, a few investigations directed had discovered that low academic performance in science subjects in schools had been a genuine worry to educationists, business associations, and government. This issue has been because of many components that incorporate students, instructors, parents, companions, society, and ecological

variables, adding to their interests in becoming gainful residents. More so, it was recorded in the 2019 Trends in International Mathematics and Science Study (TIMSS) that the Philippines flaunt last compared with the other 58 participating countries who took the test for both science and math. Moreover, in 2018, Filipino students likewise positioned last among 79 nations in reading comprehension and the second-lowest in science and mathematics in the International Student Assessment Program (PISA).

Anent to this, the wonder of educating outside specialism educators relegated to encourage subjects for which they have lacking preparation and capabilities is a critical yet long undetected issue in schools. It is a crucial issue because profoundly qualified educators may turn out to be exceptionally unfit on the off chance that they are allowed to instruct subjects for which they have little preparation or schooling. Nonetheless, as of not long ago, there has been little acknowledgment of this issue, a circumstance at any rate incompletely because of a shortfall of precise and thorough information (Bobbitt, and McMillen, 2015).

In the meantime, change in training guarantees a reformist turn of events and dodges stagnation. Educational transformation to give quality and value in schooling requires reasonably prepared instructors allocated to suitable evaluation levels and subjects. Nonetheless, change in training may make new requirements in schools that bring about instructors are is relegated to encourage subjects they are not set up to educate. When there is a lack of specific instructors, it is regular to supplant those educators with out-of-field educators. The far and comprehensive event of this marvel causes to notice its suggestions for quality schooling. Exploration reliably shows that there is a positive connection between instructor scholastic capability and student accomplishment.

In like manner, educators' instructional abilities are perhaps the most significant factors and have a vital role in advancing science accomplishment. Appropriately, educators have been appeared to impact understudies' scholarly exhibitions. They likewise assume an essential part in instructive achievement because the instructor is eventually liable for interpreting strategy right into it and standards dependent on work on cooperation with the understudies (Afe, 2011). A few investigations show that science instructors have been discovered to be the most significant factor in improving students' accomplishments in schools (Ballone-Dura, Czerniak, and Haney, 2015).

The low quality of science educators brings about poor performance in science, overcrowded classrooms, and the absence of appropriate and sufficient science facilities (Ali, Toriman, and Gasim, 2014). Instructors with required, encouraging capabilities will be relied upon to give instruction techniques to affect information. Therefore, under-effective educators will probably develop excellent performance while those who are insufficiently trained will perform ineffectively (Akubuilo, 2014).

In the Philippines, teaching outside specialized topics offers extensive difficulties, and educators express concern when managing the present circumstance. Teachers' lack of confidence in teaching concepts was manifested by preparing lessons, detailing lesson plans, selecting appropriate teaching strategies, answering students' misconceptions, selecting appropriate learning activities, and relating lectures to real-life situations. These problems were evident among and most common among public schools, especially to those institutions that hardly find qualified teachers to teach specified subject areas. For this kind of situation, teachers have

significant challenges to change or adapt to the new subject that he/she will instruct (Guzman, 2015).

Purpose of the Study

This endeavor aims to give relevant information for better understanding of the different challenges faced by science teachers teaching Non–science subject by generating complete documentation on their experiences in teaching and by gaining more insights into their sources of techniques, versatility, mechanisms, and strength in which; because of these, we can significantly identify individuals or co-teachers in present educational situations.

Moreover, this research study's findings will serve as a bridge and source of light to the authority, particularly the Department of Education (DepEd), to come up with plans and programs concerning the current problems encountered by its subordinates, which are the teachers. By making policy, guidelines, and procedure in hiring teachers, assignment of subject loads, and offering valuable professional development leading to a more competitive agency in the Philippines in fighting the economic culprits through quality education as to have the same as from the other countries.

This is also beneficial to the school heads in assessing the actual situation of some teachers encountering various problems in order to put consideration on teacher's qualification as one of the essential criteria of having quality education among students, for them to look and revisit profiling of teacher's policy by reconsidering teachers subject field expertise. Furthermore, this also serves as the bridge of the teachers encountering such problems to be heard and understood instead of hiding and being blamed by society. Their story will serve as an inspiration to other teachers.

Method

The study utilized the qualitative research method using phenomenological research design. Creswell (2013) explained that the point of an analyst in qualitative exploration is to comprehend and clarify. The reason for this qualitative investigation is to investigate and understand the encounters of science instructors teaching Non–science subjects. Moreover, this examination aims to examine and depict science instructors' challenges in the instructive school setting. Likewise, this investigation is directed on the objective people to permit the specialists to bits together an extensive and comprehensive event with a request to make a rich-text depiction of science educators' experience teaching Non–science subjects.

Moreover, a phenomenological study "depicts the significance for a few people of their lived encounters of a certain phenomenon." (Creswell, 2007, p. 57). Several authorities conducted and utilized phenomenological studies to describe common among individuals regarding a specific type of phenomenon. Hence, in this qualitative research method, the analysts recognize individual unique experiences from a particular phenomenon. The specialists then gather information from people who have experienced the wonder and build up a composite portrayal of "what" they encountered and "how" they encountered it (Moustakas, 1994).

Also, phenomenology gives a practical and helpful plan among business, instructive, and sociological research. It shows a valuable way of addressing the fundamental factors that members experience in their lives. Since the principal part of phenomenology is to comprehend the embodiment of members' experience inside a shared view, members must bring out emotional and target encounters. The emphasis while analyzing the data is on the essence (or everyday experiences) and the significance of the incidents. So, phenomenology research can be considered directive as its sampling method is purposive. However, it is essential to comprehend that all qualitative research has a phenomenological aspect (Diaz,2015).

Research Participants

Informants and participants of this study were the science teachers who encountered problems and challenges from teaching Non–science subjects. Purposeful sampling could be a technique widely employed in qualitative analysis to identify and choose data-making cases for the foremost effective use of restricted resources (Patton, 2002). It involves characteristic and choosing people or teams of people that area unit particularly experienced or older with development of interest (Ingersoll, 2013).

Research participants were selected based on the following selection criteria listed below:

a. public school science teachers teaching non-science subjects;
b. Teaching 1 to 3 years in service
c. Has already experience challenges in dealing with the subject or even handling the issue which is outside from their field of expertise, but is able in finding ways to cope with the problems successfully;
d. can share relevant and significant ideas the said problems about teaching non-science subjects
e. and willing to participate in the study

Data Collection

First, by using the purposive sampling technique, qualified research participants were selected and identified. By that, the participants were requested to fix their signature on the voluntary consent form as a sign of their commitment to the condition stipulated in providing and sharing their information as needed in the research study. Then, through the School Principal, the researcher made a letter of invitation addressed to the participants for the conduct of the study through personal interview. The researcher also allows the participants to read the purpose of the said interviews in conducting the research study and informed them that their testimonies served as a bridge or voice to all public secondary science teachers who encountered challenges and problems teaching Non–science subjects. By that, the teacher became more motivated that their experiences served as an additional basis for the government agencies and advocates to develop plans and programs that will address their problems specifying on teaching non - specialized subjects.

Second, for the rationale of their confidentiality, the participants were asked to provide their name, title, or pseudonyms. They got sincere assurance that each one of their testimonies concerning the same circumstances is control as personal. An in-depth interview was scheduled at intervals of half-hour per informants and whereas

within the focus group discussion, it will probably fall on one (1) to (3) hours. The researcher used interview guide questions that focus on the participant's experiences, techniques, and techniques to overcome the issues and insights for deciding to continue the teaching practices dealing with specialized subjects or discontinue the standard methods that happen mainly in massive faculties.

Third, during this study, throughout the interview, the researcher ensures that the participants' data, both the in-depth and focus group discussion, were noted down, and their preferred speech responses were recorded to any audio devices. Consequently, constant questions were being asked from the various participants so the researcher may solicit data towards data saturation in answer to the problem. In-depth interviews, participants were situated in front of the researcher upon discussing and recording the data. Whereas within the focus group discussion, participants were settled in a round shape structure of any entity where uniform queries were used to amass possible answers to the issues mentioned above.

Finally, after asking the informants and participants questions, the researcher's task was to transcribe and organize the information gathered into standards. Then, have the data analyst analyze the data conferred for the researcher to proceed to the next step within the study's conduct. The creative technique of collecting data was the only way to enhance and facilitate engagement among the research participants. Such approach or practices must provide a means to answer the corresponding queries in response to the conferred issues, which are coherent with the methodological approach and underpinned by an applicable method of information analysis.

Data Analysis

After collecting and organizing data, it was then presented to an expert or authority for the data evaluation to have data accuracy and validity, whether it is accurate from the source or coming from anyone unknown and imagined (Rebucas & Dizon, 2020). Content analysis was used in analyzing the data that was gathered from personal interviews. According to Moore & McCabe (2015), this is the kind of research whereby information supposed is categorized in themes and sub-themes, therefore ready to be comparable.

The main advantage of content analysis is that it helps in the information collected being reduced and simplified, whereas, at constant time, manufacturing results will then live quantitative victimization techniques. Moreover, the content analysis offers the power to analyze the qualitative information collected during a means that satisfies research objectives. However, human error is very concerned in the content analysis since there's the chance for researchers to misinterpret the information gathered, thereby generating false and unreliable conclusions (Krippendorff & bock beer, 2010).

Moreover, the response of the participants was analyzed through the use of thematic analysis. Thematic analysis will be accustomed add-up of apparently unrelated material. This method is beneficial because it is a flexible and more significant tool in analyzing data that can probably provide for a substantial data group. It can be used to analyze qualitative information and systematically gain knowledge and empathy about a person, an interaction, a group, a situation, an organization, or a culture. Furthermore, it will be utilized to analyze

qualitative data and consistently gain information and fellow feeling a few people, associate degree interaction, a group, a scenario, a corporation, or a culture.

Ethical Consideration

In this research endeavor, the researcher was asked to provide some important documents such as informed and voluntary consent and was submitted to the authority to formally request permission to study the problems and challenges encountered by the science teachers teaching non–science subjects. Therefore, the researcher had ensured their safety, cover their identity, and provide them full support to render their complete trust and confidence in helping this research study and this can be established through following ethical standards in the conduct of the task such as confidentiality of information, respect for persons, beneficence, justice, and consent. With the anonymity of research participants and confidentiality of information, the researcher assured that the information, testimonies, details given from the participants held private.

They were provided any documents that support any statement of agreement not to upload or download their audio recorded explanations. They were asked to give pseudonyms to cover their identities and assurance that their names would not appear in the research study. Anonymity and confidentiality of participants aim to ensure that every effort was made to ensure that the information generated from them cannot be traced back and used against them in reports, presentations, and other forms of dissemination (Crow, 2011).

Another research standard that the qualitative research must possess was beneficence or no harm to the said participants. In this research, the researcher prioritized the participant's safety by providing and closely monitoring them from their settings to the venue of the conduct of the interview. The last research standard that needs to be addressed in this qualitative research was justice.

In this phase, giving due credit on what the participants contribute was expected in this particular study to correspond to their earnest effort in building and crafting the study towards success. As a sign of acknowledging their contributions, a token and certificate of participation were given to each participant to fully recognize their total force effort in the said study's conduct. Apart from recognizing their sincere contributions, participants were given assurance on the great importance of their testimonies as an inspiration to those specialized science teachers who encounter challenges in teaching other subjects outside of their field of specialization.

Results and Discussion

The conduct of the study generated a massive percentage of data that was essential in this endeavor. The information was gathered from the two techniques, such as in-depth interviews and focus group discussions that were captured/recorded through the tape and cellular phone use. The informants' responses were transcribed and carefully analyzed through the process of categorization of data or emerging themes. The gathered data was used to determine the experiences of science teachers teaching Non–science subjects.

Table 1. Experiences of Science Teachers Teaching Non–science Subjects Essential Themes Core Ideas

Essential Themes	Core Ideas
Challenges in making lesson plans	• So, for more than three years in teaching Araling - Panlipunan, the problems, and challenges that I have are the making lesson plan in three preparations. (IDI005) • It takes time for me to craft my lesson plan, and of course, dealing with a particular subject is very difficult since you do not know about the concepts. It needs time and effort to go deeper with the ideas to deliver the lesson to the students. (FGD007) • It is tough for me to conceptualize, to construct lessons for a subject that is not my expertise. There are times that when I am going to discuss with my students, there are times that I deliver the wrong one, which is not in lined with my guidelines; I realize that it is not the right thing to teach, so it doesn't jive and won't match to your lesson plan that you have made and the lessons you have discussed. (FGD001) • Detailing lesson plans affects me mentally again since you have difficulty in making lesson plans. I mean lesson preparations much more in detailed lesson plans. For example, in the content, you have a hard time understanding the content or comprehension (FGDI003)
Challenges in familiarization of the subject	• It dramatically affects because the teacher becomes ineffective in teaching the subject as well. Useless in a way that you tend to make alibies or some reasons for you not to discuss the lesson because it is difficult. Also, it can lower your interest, passion, and love in teaching because of the possible notion of everybody. (IDI005) • It is challenging because I wanted my students to learn, but since I don't know how to teach the subject, I'm sure that the students will not fully understand the concept because, at first, the teacher himself doesn't understand. That's too difficult on my part because I don't know the subject. (IDI004) • It is difficult in the sense that you do not know the subject. Maybe this is one of the common factors why students don't want to go to the class because you don't see the concept of a particular subject well. It is also tricky in the sense that you cannot deliver the lesson well to the students; you cannot answer the misconception or the students' question in terms of that particular subject. (FGD007)
Challenges in choosing teaching strategy	• It affects my interest in teaching because of the methods and the strategies. It's hard for me on how to cope up with it to reach my objectives. Handling this kind of subject brings you back from the very beginning in a way that you must be a student in the meantime. (IDI002) • The teaching strategies, the teaching styles, approach that I'm going to use in teaching Araling - Panlipunan. It is challenging in a way that you need to read and go deeper with your lesson for you to discuss it with your students, unlike with our field of specialization. (IDI005) • It's not my specialization, and in terms of strategies, we have to involve them or immerse them in the different sub-topics within your subject area's content. (FGD006)

Challenges in Making Lesson Plan

Excessive workloads will contribute to worry among lecturers. Past analysis shows that lecturers spend a lot of time on lesson designing. Bubb and Early (2014) listed five leading causes of excessive workload; one in every of those was lesson designing. As a consequence of the excessive workload, lecturers suffer a higher stress level than comparable activity teams. They conjointly affirm that several types of research have found that designing and preparation are essential burdens for lecturers (Koszalka, Breman, & Moore, 2010). Challenges in making lesson plans that the participants claimed to be the most challenging experiences for them or in the lives of teachers affect the allotted time for thinking, time for the family, effort, emotion, and feelings of stress upon entering the school premises. They feel uncertain of what they had planned because they are not familiar with the subject assigned.

On the other hand, reports showed that one among the foremost difficult, time-intense and plain problematic areas facing new teachers is instructional designing or lesson plans. He states that may be no single alternative function that an educator should perform that threatens to require the maximum amount of time, effort, and energy is outside the room. Designing is a necessary side of teachers' work; however, it's time-consuming. All teachers got to arrange what they're going to teach and how they're going to teach it. However, excessive outlay amounts of your time on long, elaborated plans don’t essentially result in higher teaching and learning (Bubb and Early, 2014).

Challenges in the Familiarization of the Subject

The second that emerges was challenged in the familiarity of the subject. This theme was generated based on the sub-question, what makes it difficult teaching subject which outside formed your field of expertise and was supported by the joint statements of the participants that they had experienced struggle in delivering and discussing the lessons or even answering student's misconception due to the reason of that they are not familiar with the subject and the subject itself does not relate to their field of specialization. Accordingly, if an educator is ignorant or unknowledgeable, he will do much harm". once educators possess inaccurate info or envisage data in slender ways, they may pass on these concepts to their students. They might fail to challenge students' misconceptions; they will use texts uncritically or may alter them not suitably. Subtly, teachers' conceptions of the information shape their practice, the varieties of queries they raise, the concepts they reinforce, the types of tasks they style (Conant, 2013).

Moreover, assigning any teacher to teach any class isn't effective management and doesn't accommodate effective and quality teaching requirements. Proof from research shows that learners whose teachers understand their subjects perform higher than learners whose teachers lack core knowledge of the topic they teach. Teachers teaching outside their field struggle to be adequate and awake to learners' numerous wants. This highlights the requirement for research into faculty management's responsibility to implement a hire-for-fit follow as a potential measure to prevent teachers from being placed in unsuitable positions where they are professionally vulnerable (Chaika, 2000).

Challenges in Choosing Teaching Strategy

Challenges in choosing a teaching strategy were the last essential theme that emerged that accounts for the experiences of science teachers who were teaching subject Non–science subjects. Participants shared that this was one reason why they felt incompetent that would somehow lead to unproductive lesson discussion and unproductive day on the part of the students because their teachers had difficulty looking different and varied strategies that fit the subject they don't know or unfamiliar with.

Likewise, Armstrong (2013) stressed that teaching strategies refer to teachers' ways to assist themselves in addressing the course contents, helping to reach their goals within the future. Teaching strategies additionally establish the various accessible learning methods to enable teachers to develop varied teaching strategies to modify students' learning outcomes. Moreover, the teaching strategies acquired by teachers from training and seminars, as Batugan (2010) mentioned, would be effective only in the hands of effective teachers. The responsibility of effecting changes in the students' lives lies in the hands of the teachers.

Conclusion

Findings of the study revealed that teaching non-specialized subjects affects teacher teaching instructional competence. It would have a significant impact on students' academic performance in general. Teachers assigned to subject areas they are not familiar with make an additional burden to their lives as to several preparations they need to do. Also, incompetent teaching, incapability of answering students' queries, insufficient information shared, irrelevant experiences inculcated, and uncertainty on what to teach were mainly manifested during lesson delivery which highly affects teacher's confidence in teaching.

More so, teachers who were assigned to teach a subject outside of their field of expertise may become incompetent, hesitant to share, and unable to deliver the lesson in depth because of the subjects' unfamiliarity. The content was book-based, and direct instruction was constantly utilized; unable to draw new and modern learning experiences among students and afraid of answering student's misconception. In the same context, highly qualified teachers who were aligned in their bachelor's degree and assigned to teach subjects outside of their field may become highly unqualified due to lack of experiences and educational background on the topic to be introduced. Therefore, having an inadequate background on subject matter knowledge in teaching leads to teacher's incompetence, primarily in finding relevant teaching strategies, detailing lessons beyond knowledge level, looking for relevant learning experiences, lesson organization, and building students' knowledge foundation in learning, making them a competent citizen of the world.

Consequently, despite several professional developments offered by the department among teachers, teaching non – specialized subjects is still visible and quantifiable. In general, students' academic performance depends on quality teachers aligned and experts' teachers who are credible enough to hone student's life at their best forming them globally competent individuals. Although this phenomenon is challenging to the key informants, this would be a worthwhile endeavor that would increase teachers' opportunities to acquire relevant training,

seminars, and workshops. Moreover, this would serve as an avenue for the need to revisit the teachers hiring policy and modify teacher's assignments at the division level.

Thus, this study further suggests future researchers conduct quantitative research similar to this context. Also, further analysis may be performed on how motivation factors in teaching affect non – specialized teachers despite several problems encountered. More so, research may be conducted on the different aspects to motivate teachers who were teaching non – specialized subjects.

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Rebucas, E. M. and Dizon, D. M. (2020). Teaching Outside Science Specialism: Plight of Public-School Science Major Teacher in Montevista District, *International Journal of Science and Research*, 9 944 – 949

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