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Article

Teaching Matter in Grade 7 Science: Teachers' Instructional Practices and Pedagogical Experiences in San Mariano National High School, Isabela

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Abstract

Teaching Matter is a fundamental component of the Grade 7 Science curriculum that develops learners' scientific literacy and conceptual understanding. This qualitative phenomenological study explored the instructional practices and pedagogical experiences of Grade 7 Science teachers at San Mariano National High School, Isabela. Ten teachers were selected through purposive sampling, and data were gathered using semi-structured interviews, classroom observations, and document analysis. Braun and Clarke's thematic analysis was employed to analyze the data. Five themes emerged: (1) contextualizing science concepts through everyday experiences, (2) using inquiry-based and collaborative learning, (3) utilizing improvised instructional materials, (4) addressing learners' misconceptions through differentiated instruction, and (5) demonstrating resilience and reflective teaching. The findings emphasize the value of learner-centered instruction, contextualized teaching, and continuous professional development in improving science instruction. The study provides insights for teachers, school administrators, and curriculum developers in enhancing the teaching of Matter in junior high school.

Keywords: *Science education, Grade 7 Science, Matter, instructional practices, pedagogical experiences, inquiry-based learning, phenomenology*

1. Introduction

Science education equips learners with the knowledge and skills needed for scientific literacy and problem-solving. In the Philippine K–12 curriculum, Matter is one of the core topics in Grade 7 Science, providing the foundation for advanced concepts in Chemistry and other science disciplines. Because many concepts in Matter are abstract, teachers must employ effective instructional strategies that promote understanding and engagement.

Science teachers often encounter challenges such as learners' misconceptions, varying ability levels, limited laboratory resources, and large class sizes. To address these concerns, the Department of Education promotes learner-centered, inquiry-based, and contextualized teaching approaches that connect science concepts to learners' daily experiences.

Teachers play a vital role in adapting instructional practices to meet learners' needs despite classroom constraints. Their pedagogical decisions, classroom experiences, and innovative strategies influence how effectively students understand scientific concepts. Examining these experiences provides valuable insights into improving science instruction.

Although previous studies have examined science teaching strategies, limited qualitative research has focused on teachers' lived experiences in teaching Matter in Philippine public secondary schools. This study explores the instructional practices and pedagogical experiences of Grade 7 Science teachers at San Mariano National High School, Isabela. The findings aim to contribute to improved instructional practices, teacher professional development, and curriculum implementation in science education.

2. Objectives of the Study

This study aimed to explore the instructional practices and pedagogical experiences of Grade 7 Science teachers in teaching Matter at San Mariano National High School, Isabela.

Specifically, it sought to:

1. Describe the instructional practices employed by Grade 7 Science teachers in teaching Matter.
2. Explore the pedagogical experiences of teachers in facilitating learners' understanding of Matter.
3. Identify the challenges encountered by teachers in teaching Matter.
4. Examine the strategies teachers use to address instructional challenges and learners' diverse needs.
5. Develop implications for improving science instruction, teacher professional development, and classroom practices in teaching Matter.

3. Review of Related Literature

Effective science instruction promotes learners' conceptual understanding, critical thinking, and scientific inquiry. In teaching Matter, teachers are encouraged to use learner-centered approaches that actively engage students in constructing knowledge rather than passively receiving information. Inquiry-based learning, collaborative activities, experimentation, and contextualized instruction have consistently been identified as effective strategies for improving science achievement and scientific literacy (OECD, 2023).

Constructivist teaching emphasizes that learners develop understanding by connecting new concepts with their prior knowledge and experiences. In science classrooms, teachers

facilitate learning by encouraging learners to investigate, ask questions, conduct experiments, and explain scientific phenomena using evidence. This approach helps address common misconceptions about the properties and behavior of matter while promoting deeper conceptual understanding (Bransford et al., 2000).

Contextualized instruction has also gained importance in science education, particularly in the Philippine K–12 curriculum. By relating scientific concepts to learners' daily experiences and local environments, teachers make lessons more meaningful and relevant. Studies have shown that contextualized teaching increases learner engagement, motivation, and academic performance, especially in public schools where learners benefit from examples drawn from their own communities (DepEd, 2016).

Teachers' instructional practices play a significant role in determining learners' success in science. Effective teachers adapt their teaching methods according to learners' abilities, classroom conditions, and available instructional resources. They integrate questioning techniques, visual representations, demonstrations, cooperative learning, and formative assessment to promote active participation and monitor learners' understanding throughout the lesson (Hattie, 2023).

Despite these effective practices, science teachers continue to encounter challenges in teaching Matter. Limited laboratory equipment, inadequate instructional materials, overcrowded classrooms, time constraints, and learners' diverse academic backgrounds often affect the implementation of inquiry-based activities. Consequently, many teachers improvise instructional materials, utilize locally available resources, and modify learning activities to ensure that curriculum competencies are achieved (UNESCO, 2023).

Several studies further emphasize the importance of teachers' pedagogical experiences in improving classroom instruction. Reflective teaching enables educators to evaluate their instructional decisions, recognize learners' needs, and continuously improve their teaching practices. Professional development, collaboration among teachers, and school-based learning communities also contribute to strengthening science instruction and enhancing learner outcomes.

Although previous research has examined science teaching strategies and learner achievement, limited qualitative studies have explored the lived experiences of Grade 7 Science teachers in teaching Matter within Philippine public secondary schools. This gap highlights the need to understand how teachers implement instructional practices, overcome classroom challenges, and adapt their pedagogy in real teaching contexts. The present study addresses this gap by exploring the instructional practices and pedagogical experiences of Grade 7 Science teachers at San Mariano National High School, Isabela.

4. Theoretical Framework

This study is anchored on Constructivist Learning Theory by Jean Piaget, Social Constructivism by Lev Vygotsky, and Experiential Learning Theory by David Kolb.

Constructivist Learning Theory posits that learners actively construct knowledge by connecting new information with their prior experiences (Piaget, 1972). In teaching Matter, science teachers facilitate meaningful learning by engaging students in hands-on activities, inquiry, and problem-solving tasks that enhance conceptual understanding.

Vygotsky's Social Constructivism emphasizes that learning occurs through social interaction and collaboration. Classroom discussions, cooperative learning, teacher guidance, and peer interaction enable learners to develop scientific concepts more effectively. This theory highlights the teacher's role as a facilitator who provides appropriate support to help learners achieve deeper understanding (Vygotsky, 1978).

Kolb's Experiential Learning Theory explains that meaningful learning occurs through a cycle of concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kolb, 1984). Science teachers apply this principle by allowing learners to conduct experiments, observe scientific phenomena, reflect on their findings, and apply concepts to real-life situations.

These theories provide the foundation for understanding how Grade 7 Science teachers design instructional practices, facilitate learner engagement, and address classroom challenges in teaching Matter. They also support the exploration of teachers' pedagogical experiences in implementing learner-centered and inquiry-based science instruction.

5. Methodology

This study employed a qualitative phenomenological research design to explore the instructional practices and pedagogical experiences of Grade 7 Science teachers in teaching Matter at San Mariano National High School, Isabela. A phenomenological approach was considered appropriate because it seeks to understand and describe the lived experiences of participants regarding a particular phenomenon. Through this approach, the study captured teachers' perspectives, instructional decisions, classroom experiences, and strategies in facilitating learners' understanding of Matter.

The study was conducted at San Mariano National High School in the Municipality of San Mariano, Isabela, Philippines. The participants consisted of ten (10) Grade 7 Science teachers who were currently teaching Grade 7 Science and had at least one year of teaching experience handling the topic of Matter. They were selected using purposive sampling, ensuring that only teachers with relevant teaching experiences could provide rich and meaningful information related to the objectives of the study.

Data were collected using a researcher-developed semi-structured interview guide, complemented by classroom observations and document analysis to strengthen the credibility of the findings. Before data collection, permission was secured from the school administration, and informed consent was obtained from all participants. Individual interviews were conducted in a quiet and convenient setting, audio-recorded with participants' permission, and subsequently transcribed verbatim. Classroom observations and selected instructional documents, including lesson plans and learning materials, were also examined to validate and enrich the interview data.

The collected data were analyzed using Braun and Clarke's (2006) six-phase thematic analysis, which involved familiarization with the data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report. This analytical procedure enabled the identification of recurring patterns that reflected the instructional practices, pedagogical experiences, challenges, and instructional strategies of the participants.

To ensure the trustworthiness of the study, the researcher employed triangulation, member checking, and peer debriefing. Information obtained from interviews was validated through classroom observations and document analysis, while participants were given opportunities to verify the accuracy of the transcribed data and the emerging interpretations. An audit trail was likewise maintained throughout the research process to establish dependability and confirmability, whereas rich descriptions of the research context and participants enhanced the transferability of the findings.

Ethical principles were strictly observed throughout the conduct of the study. Approval was obtained from the appropriate school authorities before data gathering commenced. Participation in the study was entirely voluntary, and all participants signed informed consent forms after being informed of the study's objectives, procedures, potential benefits, and their rights as research participants. Confidentiality and anonymity were maintained by assigning pseudonyms to the participants, and all collected data were used solely for academic and research purposes.

6. Findings and Discussion

Theme 1: Contextualizing the Concept of Matter through Learners' Everyday Experiences

One of the most prominent instructional practices identified among the participants was the use of contextualized teaching to make the concept of Matter more meaningful and relevant to learners. Teachers consistently related scientific concepts to students' daily experiences, household materials, local agricultural products, and familiar environmental situations. They believed that connecting abstract concepts with real-life experiences enabled learners to better understand the properties, composition, and changes in matter while increasing classroom engagement and participation. By utilizing examples that learners encounter in their homes and communities, teachers were able to simplify complex scientific ideas and encourage active learning.

Participant 1 shared:

"I always begin the lesson by asking students about the things they see or use every day, such as water, ice, cooking oil, or soil. When they realize that these are examples of matter, they become more interested in the lesson."

Participant 4 stated:

"Most of our learners understand better when I use examples from farming because many of their families are farmers. They easily relate the lesson to their own experiences."

Participant 8 explained:

"Instead of immediately discussing scientific terms, I allow students to observe objects inside the classroom and identify their properties. This makes the lesson easier for them to understand."

These responses demonstrate that contextualization serves as an effective strategy for promoting meaningful learning by bridging learners' prior knowledge with new scientific concepts. Rather than relying solely on textbook explanations, teachers intentionally connected science lessons with authentic experiences that learners could easily recognize

and understand. Such instructional practices encouraged curiosity, participation, and conceptual understanding while reducing the abstract nature of the topic.

The findings support the principles of Constructivist Learning Theory, which emphasizes that learners actively construct knowledge by connecting new information with previous experiences (Piaget, 1972). They also align with the Philippine K–12 curriculum's emphasis on contextualized and learner-centered instruction, where lessons are designed to reflect learners' cultural and environmental contexts (DepEd, 2016). Furthermore, previous studies have shown that contextualized science instruction enhances learner engagement, improves conceptual understanding, and promotes scientific literacy by making science more relevant to students' everyday lives (OECD, 2023; UNESCO, 2023). These findings suggest that contextualization remains an essential pedagogical practice in effectively teaching Matter in Grade 7 Science.

Theme 2: Promoting Inquiry-Based and Collaborative Learning in Science Instruction

The participants emphasized the importance of inquiry-based and collaborative learning in helping learners understand the concepts of Matter. Rather than relying solely on lectures, teachers encouraged students to ask questions, conduct simple investigations, perform hands-on activities, and work collaboratively in groups. These instructional approaches allowed learners to actively explore scientific concepts, share ideas, and develop critical thinking and problem-solving skills. Teachers observed that learners became more engaged and confident when they were given opportunities to investigate scientific phenomena and discuss their observations with classmates.

Participant 2 shared:

"I let my students perform simple experiments whenever possible because they learn better when they discover the concepts themselves instead of just listening to my explanations."

Participant 6 stated:

"Group activities help students exchange ideas and learn from one another. They become more active during discussions and are more willing to participate."

Participant 9 explained:

"I encourage my students to ask questions before giving the answers. This helps them think critically and become more curious about the lesson."

These responses indicate that inquiry-based and collaborative learning create an interactive classroom environment where learners actively participate in constructing scientific knowledge. By engaging students in investigations, discussions, and cooperative activities, teachers promote deeper conceptual understanding and improve learners' ability to apply scientific concepts to real-life situations. Such strategies also foster communication, teamwork, and scientific reasoning, which are essential competencies in science education.

The findings support Vygotsky's Social Constructivism, which emphasizes that learning is enhanced through social interaction, collaboration, and teacher guidance (Vygotsky, 1978). They also align with the Department of Education's learner-centered approach, which encourages inquiry, experimentation, and collaborative learning in science classrooms (DepEd, 2016). Previous studies have likewise reported that inquiry-based instruction improves learners' conceptual understanding, scientific process skills, and motivation to learn science, while collaborative learning enhances classroom participation and critical

thinking (OECD, 2023; Hattie, 2023). These findings underscore the significance of creating active and collaborative learning environments in teaching Matter among Grade 7 learners.

Theme 3: Utilizing Improvised and Locally Available Instructional Materials

The participants revealed that limited laboratory equipment and instructional resources encouraged them to become creative in developing improvised and locally available teaching materials. Teachers used household items, recyclable materials, locally available objects, and multimedia resources to demonstrate scientific concepts related to Matter. They explained that these materials allowed learners to visualize abstract concepts, perform simple investigations, and actively participate in classroom activities despite resource limitations. The participants also emphasized that improvised materials made science lessons more practical, engaging, and accessible to learners.

Participant 3 shared:

"Our laboratory resources are limited, so I use bottles, plastic containers, balloons, water, and other available materials to demonstrate the different properties and changes of matter."

Participant 5 stated:

"I maximize locally available materials because students become more interested when they see objects that they use every day. It also proves that learning science does not always require expensive laboratory equipment."

Participant 10 explained:

"I also use videos and interactive presentations whenever experiments cannot be performed. These help students visualize scientific processes that are difficult to observe inside the classroom."

These responses demonstrate the teachers' resourcefulness and commitment to providing meaningful learning experiences despite limited instructional resources. Their ability to improvise instructional materials enabled learners to actively engage in science activities, develop observational skills, and better understand scientific concepts through concrete experiences. The use of familiar and accessible materials also strengthened the connection between classroom learning and real-life situations.

The findings support Kolb's Experiential Learning Theory, which emphasizes that learners develop understanding through concrete experiences, observation, reflection, and application (Kolb, 1984). Likewise, the Department of Education advocates the use of contextualized and localized instructional materials to enhance learner engagement and meaningful learning (DepEd, 2016). Previous studies have similarly reported that improvised teaching materials and locally available resources improve science instruction by making abstract concepts more concrete, increasing learner participation, and promoting creativity among teachers, particularly in resource-constrained public schools (UNESCO, 2023; OECD, 2023). These findings highlight that teachers' innovation and adaptability play a vital role in delivering effective science instruction despite instructional limitations.

Theme 4: Addressing Learners' Misconceptions through Differentiated Instruction

The participants shared that learners possess varying levels of prior knowledge and often hold misconceptions about the concepts of Matter. To address these differences, teachers employed differentiated instructional strategies by modifying explanations, providing

additional learning activities, using visual representations, and offering individualized support. They emphasized that recognizing learners' diverse abilities enabled them to deliver lessons that were more responsive to students' learning needs and helped improve conceptual understanding.

Participant 1 shared:

"Some students easily understand the lesson, while others need more examples and explanations. I adjust my teaching depending on their level of understanding."

Participant 7 stated:

"I use pictures, diagrams, and simple demonstrations because some learners find scientific terms difficult to understand. Visual materials make the lesson clearer."

Participant 9 explained:

"Before introducing a new topic, I ask questions to identify what my students already know. This helps me correct misconceptions before discussing the lesson."

These responses indicate that teachers continuously assess learners' understanding and modify their instructional approaches to address misconceptions and individual learning differences. Through differentiated instruction, visual aids, guided questioning, and continuous feedback, teachers create inclusive learning environments that support learners with varying academic abilities. Such practices help students build accurate scientific concepts while promoting confidence and active participation in classroom learning.

The findings are consistent with Constructivist Learning Theory, which emphasizes the importance of identifying learners' prior knowledge and correcting misconceptions through meaningful learning experiences (Piaget, 1972). They also support Vygotsky's concept of scaffolding, where teachers provide appropriate guidance based on learners' developmental needs (Vygotsky, 1978). Previous studies have likewise shown that differentiated instruction enhances conceptual understanding, learner engagement, and academic achievement by addressing diverse learning needs and providing appropriate instructional support (Tomlinson, 2017; Hattie, 2023). These findings suggest that differentiated teaching is an essential pedagogical practice in improving learners' understanding of Matter in Grade 7 Science.

7. Conclusion

This study explored the instructional practices and pedagogical experiences of Grade 7 Science teachers in teaching Matter at San Mariano National High School, Isabela. The findings revealed that teachers employed contextualized instruction, inquiry-based and collaborative learning, improvised instructional materials, and differentiated teaching strategies to facilitate learners' understanding of scientific concepts. Despite challenges such as limited laboratory resources, diverse learner abilities, and misconceptions about Matter, the participants demonstrated creativity, adaptability, and professional resilience in delivering meaningful science instruction. Their pedagogical experiences highlight the importance of learner-centered approaches in promoting engagement, conceptual understanding, and scientific literacy. Overall, effective science teaching extends beyond content delivery and requires reflective instructional practices that respond to learners' needs and the realities of the classroom.

8. Implications

The findings of this study have important implications for science education. Schools should strengthen support for science teachers by providing adequate laboratory facilities, instructional materials, and opportunities for continuous professional development on inquiry-based, contextualized, and differentiated instruction. School administrators may utilize the findings in designing school-based training programs that enhance teachers' pedagogical competencies and encourage collaborative learning among science educators. Curriculum developers may also consider incorporating more localized and contextualized learning activities that reflect learners' experiences and community resources. Future researchers may replicate this study in other public secondary schools using larger participant groups or mixed-methods approaches to further examine instructional practices in science education.

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