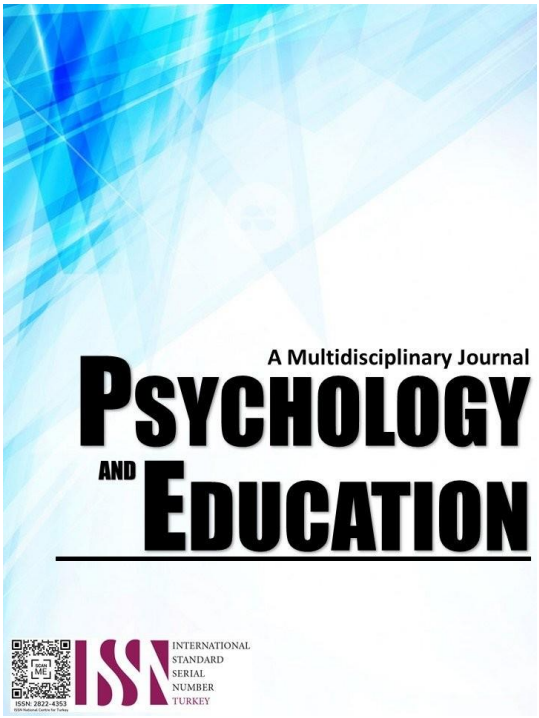
INSUFFICIENT INSTRUCTIONAL MATERIALS: EXPERIENCES OF ELEMENTARY SCIENCE TEACHERS IN THE BOONDOCKS THROUGH THE LENS OF COR THEORY



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Research Article

Insufficient Instructional Materials: Experiences of Elementary Science Teachers in the Boondocks Through the Lens of COR Theory

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Abstract

This phenomenological study explores the lived experiences of elementary science teachers in resource-constrained environments, focusing on the impact of insufficient instructional materials. Grounded in the Conservation of Resources (COR) theory, the study examines how the scarcity of teaching materials affects teachers' personal, social, and structural resources. Through in-depth interviews and thematic analysis, findings reveal that lacking of instructional resources reduces teaching confidence, increases emotional stress, and limits mentorship opportunities. Teachers often struggle with financial constraints, inadequate facilities, and the absence of modern laboratory equipment, which hinder effective science instruction. The study emphasizes the pressing need for systemic interventions, such as equitable resource distribution, enhanced mentorship programs, and increased institutional support, to alleviate the burden on teachers and improve science education quality in marginalized areas. By amplifying the voices of educators, this research provides valuable insights for policymakers and educational stakeholders in fostering resource equity and support mechanisms for teachers in under-resourced settings.

Keywords: *insufficient instructional materials, elementary science teachers, Conservation of Resources (COR) Theory, Resource-Constrained Education, teacher challenges*

Introduction

Teachers encountered challenges that hindered their ability to meet specific learning goals to promote inquiry in science subjects. A study conducted by Modaffari (2022), discusses how underfunding in school infrastructure negatively impacts student learning outcomes, particularly in STEM fields. It emphasizes the need for equitable, long-term funding to modernize educational facilities. The UNESCO (2017) report on science education also emphasizes that many countries worldwide, particularly developing regions, face significant challenges in providing adequate teaching materials and models for science classes. The report notes that instructional materials, such as models, charts, and interactive tools, are crucial for effective science teaching. Still, many schools lack these resources, which limits students' ability to grasp scientific principles fully.

These research findings highlight the worldwide problem of insufficient resources for science education, which adversely affects the quality of teaching and learning in numerous schools worldwide. These research findings mentioned above emphasize the worldwide problem of insufficient resources for science education, which adversely affects the quality of teaching and learning in numerous schools worldwide.

In the study of Mangarin and Cailo (2024), emphasize that the shortage of instructional materials in the Philippines, especially in rural areas, poses a significant challenge to effective Science, Technology, and Engineering (STE) education. They note that many schools suffer from a lack of resources, including laboratory equipment and updated teaching materials, which makes it difficult to implement a modern STE curriculum. This scarcity leads to an overreliance on traditional teaching methods, hindering the development of critical thinking and problem-solving skills among students.

This gap disseminates educational inequities, limiting opportunities for young minds in marginalized areas to develop critical thinking and problem-solving skills needed for nation-building. Addressing this issue urgently is crucial to ensure every child can access a quality science education regardless of location. Therefore, this led me to undertake a phenomenological study of elementary science teachers exploring their experiences. This study specifically aimed to address the inquiry: (1) What are the experiences of elementary science teachers when conducting science lessons with insufficient instructional materials?

Research Question

This phenomenological study explores the experiences of science teachers. Specifically, this study seeks to address the question:

1. What are the experiences of elementary science teachers when conducting science lessons with insufficient instructional materials?

Methodology

Research Design

In conducting this research study, I adopted a phenomenological approach, aiming to explore and understand the lived experiences of individuals, as outlined by Østergaard, Dahlin, and Hugo (2008). This study focuses on uncovering the essence of science teachers' experiences in resource-constrained settings who face challenges due to the lack of instructional materials. A phenomenological design

is particularly suited for this research as it explores how individuals perceive and make sense of their experiences, casting light on the meaning they ascribe to these challenges within their natural contexts. This approach allowed me to focus my research on science teachers' experiences, employing thorough interviews.

Instrument

I used in-depth interviews (IDIs) as the primary data-gathering instrument. I developed a semi-structured interview guide questionnaire aligned with the study's objective, carefully crafting each question and probing inquiry to elicit detailed participant responses. Three experts from the Graduate School validated the interview questions, rating them at 71.25% and interpreting them as good.

Procedure

The conceptualization phase clearly defined the research questions, objectives, and scope of the study. This process helped me outline the study's direction and ensure the data collection aligns with the research goals. Following this, the Society for Moral Integrity and Legal Ethics (SMILE) review and approval was crucial to ensure the study adhered to ethical guidelines. I submitted a detailed research plan to the Holy Cross of Davao College's (HCDC) SMILE, which reviewed the study to identify potential risks to participants and ensured the proper handling of informed consent, confidentiality, and other ethical considerations. Ethics approval was fundamental to protecting participants' rights and ensuring the study's integrity. The endorsement of the Graduate School Dean and Thesis Adviser was essential to the research process, providing academic validation and support for the study. Consequently, a permission letter from the Schools Division Superintendent of Davao Occidental is needed to conduct the research within the school under their jurisdiction. This permission granted formal approval to access the school and collect data from science teachers and students. I ensured that this study complied with local educational policies and regulations.

Initially, I sent a letter to the principal of the selected school to request permission to conduct the study. Subsequently, I provided informed consent forms to the science teacher participants. Science teachers vacant their time, precisely their lunch break time, to conduct my interviews with them. In-depth interviews were conducted in a comfortable, respectful environment, with each teacher allowed to share their thoughts. I recorded the whole interview using my phone with their consent. I gave a token of appreciation to the interviewees for their effort in thoughtfully answering the questions. The data gathered from these interviews provided rich, qualitative insights into the teachers' experiences in this resource-constrained environment. I retrieved the data accordingly. I transcribed and translated the participants' responses before giving the transcribed data to my analyst for coding, who then generated themes.

Data Analysis

The information gathered in this research was analyzed using Colaizzi's phenomenological thematic analysis method (Colaizzi, 1978). This method facilitated a thorough investigation of the lived experiences of science teachers working in resource-limited environments, highlighting the core of their difficulties. Colaizzi's thematic analysis consists of a six-step process: becoming familiar with the data, coding, developing themes, reviewing themes, defining and labeling themes, and composing the final report. This structured approach minimizes confirmation bias during analysis (Caulfield, 2023; Creswell, 2014). After completing the process, I wrote the final report, supporting the identified themes with direct quotes from the data and references to relevant scholarly literature. This systematic process enabled me to extract significant insights from the data.

Ethical Considerations

I followed specific ethical guidelines to protect my morality and guide myself as a researcher. Adhering to ethical guidelines was important to protect participants' dignity, rights, and welfare.

Social Value. This study had significant relevance for implementing science curricula in the Philippines. The results generated from this study were important to inspire other schools and teachers to be innovative, creative, and competent in their science lessons despite the lack of instructional materials. This could also serve as a basis for the Department of Education officials' strategic planning and budget allocation for improving science education.

Informed Consent. This consent allowed participants to understand their participation in this study and its requirements. Before conducting in-depth interviews (IDI), informed consent was given to all participants face-to-face after they expressed their willingness to participate in the study. The science teacher participants were not under coercion and were free to withdraw at any time and for any reason.

Risks, Benefits, and Safety. I anticipated that there would be low risks during the study, such as personal and academic risks. Thus, I minimized the risk by scheduling interviews with the science teacher participants during their available and vacant times to ensure their classes remained uninterrupted. My study acknowledges the potential for psychological or emotional risks, such as triggering past emotional experiences, which may arise during participation. Participants will be informed of these risks beforehand, and appropriate measures, allowing participants the option to withdraw at any time without penalty, will be implemented to minimize and address these risks.

Privacy and Confidentiality of Information. The records from this study were kept as confidential as possible. I ensured the safety and anonymity of the science teacher participants. Hence, I ensured compliance with the Data Privacy Act of 2012, which safeguards

personal information within information and communication systems across the public and private sectors.

Justice. To observe justice, I ensured no force or coercion was used to collect data during the survey. Whenever their participation incurred a monetary cost, I shouldered any reimbursement required.

Transparency. Before conducting the survey, I oriented the science teacher participants to guarantee that procedures were unbiased and fair. I ensured that I reported all data accurately. Before reporting the study's results, I asked the science teacher participants to review the findings and confirm that they agreed with how the results were stated. I also intended to provide the Department of Education and the teachers with the study's results so they could utilize them in their various endeavors.

Qualification of the Researcher. I am a student of the Master of Arts in Education in Teaching General Science. I obtained a baccalaureate degree in Bachelor of Secondary Education, majoring in Biological Science, where I conducted a correlational study related to the field. These foundational studies equipped me with essential research skills and a solid understanding of the scientific process. I work as a public school teacher in the Department of Education. Adequacy of Facilities. I provided resources that were comfortable for the research participants. With formality and precise adherence to ethical standards, I sent a formal letter to the principal of the selected school to ask permission to use facilities and conduct the in-depth interviews (IDI) with science teacher participants.

Community Involvement. In preparing the research interview questions, I ensured the statements did not reflect bias against race, gender, religion, or culture. After completing the paper, I planned to disseminate the study's results to empower more teachers or individuals to conduct research.

Results and Discussion

This study aimed to explore the experiences of elementary science teachers in resource-constrained environments through the lens of the Conservation of Resources (COR) theory. The findings are structured based on the modified paradigm, encompassing personal, social, and structural resources, followed by its impact on teacher well-being and performance.

Personal Resources

"Here in our school, Ma'am, we often struggle with limited access to materials, and other essential learning tools, kabalo naman jud ta ana kay we are located in a remote area."

"Moments like these make me doubt my ability to inspire a love for science." (IDI-Participant 1)

"It is an add to stress and frustration sa part sa teacher nga dapat maka think ta ug another way to provide these materials for our lesson." (IDI- Participant 3)

Science teachers in remote areas face persistent challenges due to the lack of instructional materials directly affecting their teaching efficacy. This scarcity reduces their confidence in delivering effective science instruction, leading to emotional stress and frustration. According to Johnson (2020), inadequate instructional materials hinder teachers' ability to facilitate hands-on learning, ultimately affecting students' conceptual understanding. Similarly, Smith (2021) argues that teachers often suffer from professional burnout due to the continuous need for improvisation when experiencing resource shortages. This aligns with the findings of this study, where participants expressed their struggle to meet students' curiosity and engage them in science learning.

Social Resources

"Accessing mentoring and guidance from experienced teachers is challenging due to our remote location." (IDI- Participant 1)

"Good thing jud nga naa mi master teacher na ga initiate to use and make contextualized materials." (IDI- Participant 2)

Limited mentorship opportunities emerged as a significant challenge due to the remote location of the schools. Research by Thompson and Williams (2022) emphasizes the importance of mentorship in teacher development, particularly in underprivileged areas. The participants in this study reported that the absence of experienced mentors restricted their professional growth, forcing them to rely on peer collaboration. Additionally, dependence on teacher initiatives was evident, with teachers creating their teaching materials due to the lack of support from the administration. This finding is consistent with Garcia et al. (2023), who highlight that teacher-driven initiatives are crucial in overcoming educational barriers in low-resource settings.

Structural Resources

"Of course, mo gasto gyud ta ana from our own pocket but still fulfilling." (IDI- Participant 1)

"Learning is better man jud if nay specific classroom for experiments." (IDI-Participant 3)

"Maka-receive man materials but not enough and sometimes di na maapilan ang schools located sa remote areas." (IDI-Participant 3)

Financial constraints significantly impact teachers' ability to access necessary materials. Many teachers reported using personal funds to purchase instructional materials, a finding supported by Martinez and Rogers (2023), who state that teachers in underfunded schools often bear the financial burden of classroom resources. Inadequate facilities and a lack of modern technology further exacerbate these

challenges, limiting the ability to conduct hands-on experiments and interactive science lessons. As Brown et al. (2021) highlighted, the unequal distribution of resources across schools in urban and rural areas contributes to educational disparities, making it difficult for teachers in remote locations to provide quality instruction.

Impact on Teacher Well-Being and Performance

"By being resilient and believing in our capabilities and adapting to limitations, we can innovate and create effective learning materials from local resources." (IDI-Participant 1)

"Positive relationships with colleagues, parents, and the community have been invaluable in managing resource constraints. It gives us motivation that we are supported." (IDI- Participant 1)

Teachers' persistent challenges in resource-limited environments contribute to their well-being and professional performance. According to Lopez et al. (2023), teachers in such settings report higher stress levels and lower job satisfaction due to the continuous struggle to provide quality education. This study's findings highlight that the lack of instructional materials and limited institutional support negatively impact teacher motivation, ultimately affecting students' learning experiences.

Moreover, positive interpersonal relationships are crucial in mitigating the stress associated with resource limitations. Teachers who receive emotional and professional support from colleagues, school administrators, and the community report greater job satisfaction and reduced burnout. This finding aligns with Harris and Patel (2021), who emphasize that a supportive work environment enhances teacher retention and overall well-being.

Conclusions

This phenomenological study explores science teachers' experiences in the context of insufficient instructional materials. Results from the analysis showed the difficulties and challenges they faced due to resource scarcity, which included personal, social, and structural factors. Personal difficulties include reduced teaching confidence. The results emphasize the necessity for focused initiatives to tackle the individual difficulties encountered by educators as a result of limited resources. Educational institutions should prioritize providing adequate instructional materials to alleviate the emotional burden on teachers and restore their teaching confidence. Additionally, implementing support systems such as mentorship programs, counseling services, and professional development opportunities can help educators navigate emotional stress and build resilience. Addressing these personal difficulties is essential for improving teacher well-being and ensuring the quality of education delivered to students.

In response, teachers employed strategies such as resource substitution, which involved creating contextualized materials. This indicates how resilience allows teachers to turn challenges into opportunities for creativity and adaptability. Educators exhibited a growth mindset, perceiving obstacles and difficulties as opportunities for innovation rather than setbacks to achievement. Schools and educational policymakers should prioritize training programs that equip teachers with skills to develop contextualized materials and encourage collaborative resource-sharing practices. By supporting these adaptive strategies, institutions can help mitigate the impact of resource scarcity, enabling teachers to maintain effective instruction and professional well-being. Recognizing and promoting teachers' innovative approaches can inspire systemic changes emphasizing creativity and resourcefulness as essential education components in challenging contexts.

School administrators should invest in resource development and maintenance programs to safeguard instructional quality. Additionally, fostering a supportive environment that prioritizes teacher well-being through resource allocation, workload management, and access to professional development can enhance both their effectiveness and job satisfaction. Ensuring a balance between resource provision and teacher support is crucial for promoting long-term educational success.

Furthermore, this study focuses on science teachers' experiences within a specific context of insufficient instructional materials, which could restrict the applicability of the results to different subjects or educational environments. The scope of this research did not consist of longitudinal analysis, which may have offered more profound insights into the long-term effectiveness of coping strategies and resource-building practices. Future research could tackle these limitations by increasing the sample size, including various educational settings, and using mixed-method approaches to understand better the challenges and strategies educators encounter.

The findings of my study provide a solid foundation for future research endeavors in science education. Future studies could explore how science teachers' resilience develops in resource-constrained environments. Additional studies are required to evaluate how effective the instructional materials designed by teachers in a contextualized manner are. Studies could assess how these materials influence students' understanding of science concepts and ability to apply knowledge in real-world contexts.

Research on the impact of systemic interventions, such as increased funding and teacher training programs, could provide insights into practical strategies for addressing resource gaps and inform evidence-based policy decisions.

Given the potential for burnout, future researchers should investigate how teachers manage their professional duties while maintaining personal well-being in demanding settings. They should also prioritize efforts to enhance mental health and support work-life balance.

This study emphasizes science teachers' innovative and resilient strategies in resource-constrained environments. While their ability to

create contextualized material development is commendable, it underlines the urgent need for systemic support to sustain and enhance teaching effectiveness. By addressing these gaps, educational stakeholders can better support teachers, enhance science education, and ensure equitable learning opportunities for all students, regardless of resource limitations.

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