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CHALLENGES IN LEARNING MATHEMATICS: INSIGHTS FROM SEVENTH-GRADE STUDENTS

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A R T I C L E I N F O

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A B S T R A C T

This study explores the contribution of discourse on mathematics by focusing on the lived experiences of seventh-grade students in RAEOA, Timor-Leste. It uses a qualitative descriptive approach; data were collected through direct observation and unstructured interviews. The findings reveal that the most prominent challenge stems from the inability to maintain concentration, particularly in noisy classroom environments, which disrupts comprehension and problem-solving. Students also reported difficulty translating basic mathematical operations into structured problem-solving. Some students struggled with geometric measurement practice. Minority students indicated positive attitudes toward repetitive calculations, viewing them as enjoyable rather than burdensome. These indicators became important for addressing both environmental factors and instructional strategies to improve engagement and comprehension in mathematics. This becomes a novelty of study, lying in subjective accounts of learners in a geographically and academically diverse setting. It contributes fresh implications for context-responsive pedagogical practices in mathematics.

INTRODUCTION

Mathematics remains a cornerstone of secondary education worldwide, serving not only as a gateway to higher academic pursuits but also as a foundation for logical reasoning and problem-solving in everyday life. Yet, despite its recognized importance, many students continue to experience significant difficulties in learning mathematics,

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often resulting in low achievement, decreased motivation, and a negative perception of the subject. This aligns with Daramola et al. (2024), which emphasizes that learning is shaped by social interaction and cultural context. Much of the existing research has examined these challenges through large-scale assessments and teacher-focused perspectives, with limited attention to students' own voices, particularly in rural or less-studied regions such as RAEOA, Timor-Leste.

In this context, understanding mathematics learning from students' perspectives is not only valuable but also necessary. The present study offers a novel contribution by capturing the lived experiences of seventh-grade students in RAEOA, revealing the specific conditions, perceptions, and personal challenges that shape their engagement with mathematics. Unlike studies that generalize findings across diverse contexts, this research foregrounds the unique educational environment of RAEOA, where limited resources, variable classroom management, and distinctive student attitudes intersect to influence learning outcomes. This approach resonates with Affandy & Azman (2025), who posit that learning is influenced by multiple layers of environment, from immediate classroom settings (microsystem) to broader cultural and societal conditions (macrosystem).

Preliminary observations and interviews in the field indicated that environmental factors, particularly classroom noise, play a substantial role in disrupting concentration during mathematics lessons (Belo et al., 2024). Such distractions can lead to incomplete comprehension of teacher explanations, making it harder for students to solve exercises, especially in topics that require multi-step reasoning. These findings reflect the principles of Shaban et al. (2024), which suggest that extraneous cognitive demands, such as noise and distractions, reduce working memory capacity and hinder effective problem-solving in mathematics.

Another notable finding is the difficulty students face in bridging the gap between mastering basic mathematical operations and applying them in structured problem-solving tasks. For some, independent practice, such as geometric measurement, poses additional barriers, while a smaller group expressed enjoyment in repetitive calculations, challenging the common narrative that mathematics is inherently tedious. This mirrors Martín & Bybee (2022), who emphasize that students build new knowledge by actively connecting it to prior understanding. When the transition from foundational skills to higher-order applications is not scaffolded correctly, students struggle to internalize concepts, underscoring the need for

differentiated instructional strategies (Zhou, 2024).

By situating these findings within the lived realities of students in RAEOA, this study provides fresh insights into how localized factors, both environmental and cognitive, affect mathematics learning. The novelty of this work lies in its direct engagement with students' perspectives in a geographically underrepresented area, offering a nuanced understanding that can inform culturally and contextually responsive teaching strategies. This aligns with Kusmawan et al. (, which underscores the importance of integrating students' cultural backgrounds and experiences into teaching practices to foster more meaningful and effective learning outcomes.

METHOD

Qualitative research is a type of study that seeks to describe the actual situations experienced by the subjects (Tümen Akyildiz & Ahmed, 2021). This study employed a qualitative descriptive approach to explore and understand the challenges students encounter in learning mathematics, as perceived through their own experiences. Such an approach was chosen because it enables an in-depth portrayal of learners' perspectives, difficulties, and learning contexts that would not be fully captured through quantitative measures. The research was conducted in a junior secondary school in RAEOA, Timor-Leste. The site was selected purposively, based on accessibility, participant availability, and the relevance of the school context to the research focus.

Participants consisted of eight seventh-grade students, selected purposively based on specific criteria: active engagement in mathematics classes, willingness to provide open and honest responses, and representation of varying academic abilities (high, medium, and low) as assessed by their mathematics teacher. To maintain confidentiality, pseudonyms in the form of codes (S1–S8) were used throughout the analysis and reporting process.

Data were gathered through in-depth, unstructured interviews that began with a single open-ended question: *"What is the biggest challenge you face in learning mathematics?"* This question served as a stimulus for participants to share their experiences freely, allowing them to elaborate on any difficulties, perceptions, and contextual factors they considered relevant. The unstructured format allowed the conversation to flow naturally, enabling the researcher to probe further only when clarification or elaboration was needed. According to Komildjanovna (2024),

open-ended questions are a research method designed to elicit broad and detailed responses from participants.

Thematic analysis was employed to interpret the data, beginning with the transcription of all interviews, followed by data reduction to isolate information relevant to the research focus. Recurring ideas were then categorized into emerging themes, including concentration-related challenges, difficulties in applying theory to practice, and varying perceptions of mathematical problem-solving. Christou (2023) stated that thematic analysis is used in qualitative research to identify patterns or themes within research findings. The study followed the framework proposed by Miles & Huberman (1994), involving iterative cycles of data condensation, display, and verification.

To ensure the credibility and trustworthiness of the findings, triangulation of sources was applied by comparing students' accounts with the perspectives of their mathematics teacher and the researcher's own observational notes. In addition, member checking was carried out, allowing participants to confirm and clarify the researcher's interpretations, thereby ensuring that the analysis faithfully reflected their intended meanings.

RESULT AND DISCUSSIONS

From field interviews, the researcher found that, when learning mathematics, teachers explain that students lack concentration when the classroom is noisy, making it difficult for some topics because they do not put maximum effort into the teacher's explanation. Students will find it more difficult to solve exercises. Some students find it difficult because, when it comes to practice, they cannot do it alone, such as measuring geometric shapes. Also, mathematics is more unique because there are only four signs, but forming them into questions makes it difficult. The following is information provided by participants:

> *Challenge or difficulty? For me, there is none. But when the teacher explains, I lack concentration, and when the teacher asks again, I do not understand because there is no concentration. And no concentration because, in the classroom situation, there is noise. [...] [S1].*

For me, there is no challenge or difficulty. When our brain is hard, we feel it is difficult; when our brain is soft, we feel the matter is easy to do. I understand mathematics when the teacher explains, but I do not understand it when the teacher does not explain clearly, especially in some topics. [S2]

The challenge is that if we do not put maximum effort into understanding the explanation, we will be confused about what the teacher explains. [S3]

For this challenge, there is little to go on when solving the exercise is not well understood, so this becomes a challenge. [S4]

This challenge depends on each student's understanding, because some find the subject too difficult because they count a lot, but for me, counting a lot makes me happy and not bored while studying. [S5]

This challenge is none for me. When the teacher explains, I do not pay attention, so I feel confused. But when I ask a question and the teacher explains repeatedly, I can understand more. [S6]

For me, the challenge in learning mathematics is related to practice. [...] [S7].

The challenge I face is that there are only four mathematical signs, but when they are combined into a question, it becomes difficult. [S8]

The findings from direct interviews indicate that the challenges students face in learning mathematics are strongly influenced by two main factors: concentration and the nature of the learning environment. Several participants highlighted that a noisy classroom significantly disrupts their ability to focus on the teacher's explanation, making it difficult to understand certain topics and solve practice exercises. This aligns with previous research suggesting that classroom noise negatively affects students' working memory and comprehension, particularly in subjects that require sequential reasoning, such as mathematics. These results can be understood through Lawson (2023), which posits that extraneous factors (such as environmental distractions) consume part of the limited working memory capacity, thereby reducing students' ability to process and retain essential instructional content.

Some students (S1, S3, S6) explicitly stated that the absence of concentration during explanations leads to confusion and a lack of understanding, which is only resolved when the teacher repeats the explanation. This indicates that sustained attention during lessons plays a crucial role in comprehension and retention of mathematical concepts. This finding is supported by Wickens (2021), who emphasizes that attention is a limited cognitive resource and that maintaining focus is essential for effective information processing and learning.

Another recurring challenge, as expressed by participants (S4, S7), involves difficulty in applying theoretical understanding to practice, such as measuring geometric figures independently. This gap between theory and practice suggests that hands-on learning opportunities and scaffolding may be insufficient, thus limiting students' ability to work autonomously. This aligns with Lombardi & Shipley (2021), which emphasizes that learners actively construct knowledge by connecting new concepts to prior understanding, and that meaningful learning occurs when students are provided with opportunities to apply theory through guided practice and problem-solving activities.

Interestingly, one participant (S5) emphasized that while many perceive counting as burdensome, they personally find it enjoyable and motivating. This suggests individual differences in attitudes toward mathematical tasks, which may influence learning persistence and engagement. This observation is supported by Kapasi & Pei (2022), particularly the concept of self-efficacy, which posits that learners' beliefs in their own abilities can affect their motivation, effort, and persistence when engaging in challenging tasks.

Moreover, a unique perspective came from students (S8) who found it puzzling that mathematics, despite having only four basic operations, becomes complex when these are integrated into problem-solving contexts. This highlights a conceptual challenge; students may understand basic symbols but struggle with higher-order problem structuring and interpretation. This aligns with Akmam et al. (, which emphasizes that learners comprehend new information more effectively when they can relate it to existing cognitive structures, and that understanding foundational concepts alone is insufficient without opportunities to integrate them into complex problem-solving scenarios.

Overall, these insights reveal that the key challenges are not solely due to mathematical content but are also rooted in environmental factors, concentration

levels, practice opportunities, and individual learning attitudes. Addressing these issues requires not only content-focused interventions but also strategies to improve classroom management, promote active learning, and provide personalized support for diverse student needs.

CONCLUSIONS

Student concentration is a key factor affecting mathematics learning. Classroom noise often disrupts students' focus, making it difficult to understand explanations and complete exercises. When concentration is low, students tend to feel confused, requiring the teacher to repeat explanations to grasp the material.

Challenges in practice are significant. Students often struggle to apply theoretical knowledge, such as measuring geometric figures independently, indicating the need for more guided practice and hands-on learning opportunities.

Individual attitudes toward mathematics influence learning experiences. Some students enjoy calculation tasks, while others find them overwhelming, highlighting the importance of personalized approaches that cater to students' interests and needs.

Conceptual difficulties arise when basic mathematical operations are integrated into problem-solving contexts. Students may understand the symbols but find it challenging to structure and solve more complex problems.

These conclusions emphasize that the challenges in learning mathematics are not only content-related but also influenced by environmental factors, concentration levels, practice opportunities, and individual differences among students.

Recommendation

1. **For teachers:** Use interactive, clear, and inclusive teaching strategies. Repeating explanations, employing visual aids, and providing hands-on practice can help students better understand concepts.
2. **For schools:** Ensure a conducive classroom environment with minimal noise and provide supportive learning facilities and resources for independent mathematical practice.
3. **For students:** Enhance concentration by managing time, practicing repeatedly, and actively engaging during lessons.

For future research: Explore psychological factors, such as motivation, attitudes, and learning strategies, that influence students' ability to understand mathematics, to develop more personalized and effective teaching approaches.

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