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Unfolding the Barriers of Problem-Solving Skills: Narrative of Mathematics Teachers

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Abstract: This study explored the instructional approaches of junior high school mathematics teachers in developing students' problem-solving skills, drawing from thematic analysis of data from seven (7) teacher-participants in Compostela West District, Davao de Oro Division. The findings revealed two dominant barriers - weak foundational knowledge in mathematics and negative attitudes/low motivation - demonstrating teachers' challenges in enhancing problem-solving abilities despite implementing coping strategies like motivational techniques and scaffolding with consistent practice. The study highlighted how these strategies fostered mathematical reasoning and confidence, yet uncovered persistent obstacles, including significant gaps in basic arithmetic skills and widespread math anxiety, particularly among students with limited prior preparation. Teachers emphasized the need for systemic support, such as remedial programs and mindset training to bridge foundational gaps. Drawing from participants' experiences, the study proposed actionable recommendations, including implementing systematic remedial programs, combatting negative attitudes through growth mindset interventions, and strengthening scaffolding techniques. Overall, it positions targeted, student-centered approaches as vital for transforming mathematics into an accessible discipline that cultivates problem-solving competence and mathematical resilience among 21st-century learners.

Keywords*: Unfolding The Barriers, Problem-Solving Skills, Narrative, Mathematics Teachers.*

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I. INTRODUCTION

In today's digital age, having knowledge alone is no longer enough for students to thrive. To succeed in their future careers, they must develop essential 21st-century skills, especially problem-solving abilities. These skills are crucial not only for tackling real-life challenges but also for making sound and effective decisions. In schools, mathematics plays a central role in nurturing students' capacity to solve problems. Through problem-solving tasks, learners are encouraged to understand, process, and articulate the steps they take in reaching solutions and making thoughtful decisions.

Globally, schools are placing greater emphasis on strengthening students' problem-solving abilities. This competency is considered a key focus in many education systems around the world. For example, in China, teachers often guide students by modeling how to solve a given problem, then encouraging them to apply that approach to similar but unfamiliar situations. In contrast, Indonesian educators believe that students must first develop a solid foundation in basic concepts before engaging in problem-based learning. Interestingly, this method doesn't always require formal instruction in problem-solving strategies. Instead, consistent exposure to real-world problems helps students naturally enhance their critical thinking and analytical skills (Aisyah et al., 2020).

In the Philippine context, Pentang et al. (2021) emphasized the pivotal role of elementary teachers in improving students' performance in mathematics through the development of problem-solving skills. To achieve this, teacher education programs must offer comprehensive training that prepares future educators to effectively implement the goals of the mathematics curriculum, particularly in fostering these essential skills among learners.

Meanwhile, Andrade (2024) argued that students' poor performance in mathematics often stems from gaps in the way teachers deliver instruction. When educators lack the necessary knowledge, skills, and confidence in teaching math, these shortcomings are inevitably passed on to their students. As a result, many Filipino learners struggle with recalling relevant

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formulas, applying problem-solving methods, grasping core concepts, and demonstrating overall mathematical competence.

At the regional level, students continue to face various challenges in learning mathematics. These include difficulties in retrieving math facts, interpreting mathematical language, and solving word problems. According to Velez et al. (2023), the most frequent issues students encounter involve understanding the problem, selecting an appropriate strategy, and avoiding careless mistakes. They also struggle with analyzing questions, identifying the right solutions, constructing equations, and simplifying expressions.

Locally, in the Compostela West District under the Division of Davao de Oro, concerns have also been raised about students' problem-solving abilities. In our school, for instance, many math teachers express worry over learners' lack of foundational skills, which are vital for solving even basic word problems. This study aims to explore and identify innovative strategies that can help strengthen students' problem-solving capabilities. Ultimately, uncovering the root causes of these challenges, designing interventions based on research findings, and empowering teachers to adopt effective techniques will be key steps in enhancing students' skills and overall performance in mathematics.

II. METHOD

In this study, I employed a qualitative phenomenological design. The goal of using phenomenology was to gather data in its raw form and better understand the lived experiences of individuals. This approach centered on exploring the common experiences of a particular group and examining how a phenomenon shaped their perspectives, as well as the meaning they attached to it.

The research was carried out in full compliance with ethical standards for academic studies. It underwent review and approval by the RMC Review Ethics Committee (REC), ensuring that the rights of participants and the communities connected to the research were respected. As Mirza, Bellalem, and Mirza (2024) explain, ethics in research are grounded in norms and values that guide decisions in data collection, analysis, and the sharing of results.

The participants in this study were seven mathematics teachers from the Compostela West District in Davao de Oro. They were purposively chosen based on their experience of teaching mathematics at the junior high school level for more than three years. To ensure a diverse perspective, the participants came from three schools of varying sizes—categorized as small, medium, and large—within the Compostela West District of Davao de Oro Division. This purposive sampling provided a range of school contexts, which supported triangulation of the findings.

In this study, in-depth interviews served as the main research instrument. This method made it possible to have direct and meaningful conversations with junior high school mathematics teachers, giving them space to share their lived experiences, emotions, and pedagogical insights. Interviews were particularly effective in drawing out reflective and authentic responses. By using active listening and thoughtful probing, I was able to ensure that the data captured truly reflected the teachers' classroom realities and unique experiences.

As the researcher, I played a central role in ensuring the reliability of the findings. My responsibility was to guide the interviews by using the research questions and carefully designed probes. These conversations allowed me to collect the participants' feelings, observations, and perspectives about their work. I crafted questions that were thought-provoking and engaging to elicit substantial and meaningful responses. After the interviews, I personally handled the transcription of the data and carefully analyzed the transcripts.

The analysis process involved a thorough review of the collected data to extract the most significant insights. I categorized and coded responses to identify recurring ideas and patterns. From these codes, I developed themes that highlighted the essential findings of the study. This process followed Thematic Content Analysis, a method described by Dawadi (2020), citing King (2004), as an approach that identifies themes representing the narratives within data sets. To strengthen the validity of the results, the study also employed environmental triangulation. As explained by Vivek (2023), environmental triangulation involves gathering information across different contexts, which helps enrich the depth and reliability of the findings.

III. RESULTS AND DISCUSSIONS

The study identified two major barriers that hinder students' problem-solving skills, as well as the coping strategies teachers employ to address these challenges. From the participants' narratives, two main themes emerged regarding the barriers: weak foundational knowledge in mathematics and negative attitudes coupled with low motivation.:

- *Weak Foundational Knowledge in Mathematics.*

Teachers emphasized that gaps in basic mathematical understanding serve as a critical barrier to developing students' problem-solving skills. Many learners were found to lack proficiency in essential arithmetic, algebra, and computational skills, making it difficult for them to progress to more complex mathematical tasks. Concepts such as fractions, decimals, and equations were often poorly understood, leaving students dependent on memorized formulas rather than building conceptual knowledge. This lack of foundational skills often prevented them from effectively analyzing and solving higher-level problems. Supporting this, Ling and Mahmud (2023) noted that the mastery of mathematical problem-solving

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remains a persistent challenge among students, who often struggle with word problem comprehension, solution planning, and accuracy in computation.

- *Negative Attitudes and Low Motivation*.

The findings also revealed that students' perceptions of mathematics significantly influence their problem-solving ability. Learners frequently viewed the subject as difficult, irrelevant, or unenjoyable, which led to disengagement and avoidance of participation. Teachers observed that students often expressed dislike or fear of the subject, particularly due to low confidence or fear of making mistakes. Andrade (2024) argued that poor mathematical performance may be linked to gaps in how teachers nurture the necessary knowledge, skills, and attitudes in learners. Similarly, Rahmawati (2021) observed that passive learning habits and limited interest hinder students' ability to think creatively and analytically.

While these barriers posed considerable challenges, teachers actively sought ways to support their students. The study revealed that educators used various coping strategies, with particular emphasis on motivational approaches, scaffolding techniques, and consistent practice. The details of these strategies are presented in the following section.

- *Motivational Strategies.*

The participants' accounts revealed that teachers employed a range of motivational strategies to address students' disengagement and negative perceptions of mathematics, especially in relation to problem-solving. Among the most commonly mentioned were gamification and reward systems, both of which were found to spark students' interest and make learning more enjoyable. Teachers also highlighted the value of interactive activities and positive reinforcement in creating a supportive and engaging classroom environment. As Mehadi (2019) pointed out, knowledge alone is not enough for students to succeed in today's world; they also need 21st-century skills such as problem-solving, creativity, innovation, metacognition, and communication.

- *Scaffolding and Consistent Practice*.

The study further revealed that scaffolding was a widely used instructional strategy to address gaps in students' mathematical foundation. Teachers explained that breaking down complex problems into manageable, step-by-step tasks was vital in helping students progress with confidence. They also relied on strategies such as vernacular translations, visual aids, and simplified explanations to make abstract concepts more accessible. These scaffolding techniques allowed students to gradually develop both competence and confidence, particularly when dealing with word problems. In line with this, LinkedIn (2024) stressed that clearly and accurately defining a problem is the first essential step in any effective problem-solving process.

Beyond classroom strategies, the study also provided deeper insights into how teachers tackled the barriers to enhancing students' mathematical problem-solving skills. Two key recommendations emerged: implement systematic remedial programs and combat negative attitudes and low motivation. Teachers underscored the importance of remedial programs that follow a sequential and incremental framework, ensuring students achieve mastery of prerequisite skills before moving on to more advanced content. At the same time, they highlighted the need for targeted interventions to foster intrinsic motivation and reshape students' perceptions of mathematics. One effective approach is the integration of growth mindset principles into daily instruction, emphasizing that mathematical ability can be developed through persistence and that mistakes are valuable opportunities for learning.

Overall, the findings of this study closely align with Piaget's (1977) Cognitive Development Theory and Vygotsky's (1978) Zone of Proximal Development (ZPD). Piaget's theory helps explain how students' weak foundational knowledge reflects underdeveloped concrete operational schemas, which are essential precursors to formal operational thinking needed for advanced problem-solving. This highlights the need for systematic remedial programs to address those gaps. On the other hand, Vygotsky's concept of the ZPD supports the effectiveness of scaffolding strategies, where step-by-step guidance, use of vernacular explanations, and gradual skill-building mirror the role of the "more knowledgeable other" in helping students progress from their current abilities toward their full potential in problem-solving.

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