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Research Article

Understanding Students' Mathematical Problem-Solving Difficulties: Teachers' Strategies and Learners' Coping Mechanisms

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Abstract

Solving mathematical problems remains a persistent challenge among learners, prompting this study to explore the specific difficulties experienced by students in a public secondary school in Digos City, Davao del Sur. Using a qualitative phenomenological research design, the study engaged ten mathematics teachers and fourteen students selected through purposive and convenience sampling. Data were generated through key-informant interviews and focus group discussions and analyzed using Braun and Clarke's (2021) thematic analysis framework. Findings revealed five major themes describing students' difficulties: (1) lack of comprehension of word problems, (2) difficulty translating mathematical phrases, (3) negative attitudes toward mathematics, (4) preparation and focus issues, (5) memory issues, and (6) instructional issues. To address these challenges, teachers employed varied strategies, including differentiated methods, vernacular translation, and motivational techniques, while students relied on personal responsibility through studying, asking questions, and practicing problem-solving skills. The study highlights the shared responsibility of the academe, teachers, students, and parents in providing sustained support to strengthen learners' problem-solving competence and improve mathematics performance.

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1. Introduction

Difficulty in solving mathematics problems is observable among many students across grade levels. Although mathematics is taught from early childhood through higher education and integrated into daily life, it remains one of the most feared subjects in formal schooling (Oracion & Abina, 2021). Many learners perceive mathematics as inherently difficult, a belief that reinforces mathematics anxiety and undermines their ability to develop problem-solving skills and grasp fundamental concepts (Zakariya, 2022).

Students' difficulties in solving mathematical problems stem from multiple, interacting causes. Recent reviews identify factors such as low personal responsibility, limited home support, weak reading and language skills, loss of focus, ineffective instructional approaches, and insufficient reinforcement of understanding as contributors to failure in mathematics (Zakariya, 2022; Alreshidi, 2023). Because mathematics builds progressively on previously learned concepts, gaps in prerequisite knowledge make new topics harder to learn and increase the likelihood of confusion and error (Alreshidi, 2023).

Despite continuous curriculum improvements and expanded learning resources, many students still struggle with mathematical problem-solving. These difficulties arise not only from cognitive limitations but also from language barriers, ineffective instructional strategies, and students' own learning habits. While previous studies have documented these issues broadly, few have explored the problem from both teacher and student perspectives within a public-school context in the Davao

Region, and even fewer have done so through a phenomenological lens that captures lived experiences.

This gap underscores the need for a deeper, context-sensitive understanding of students' difficulties in solving mathematical problems, particularly in environments where learners face linguistic, instructional, and affective challenges.

Difficulties in Understanding and Representing Mathematical Problems

Students frequently experience difficulty interpreting mathematical word problems, particularly when they have weak reading comprehension or limited exposure to mathematics-specific vocabulary. Mathematical texts combine everyday language, discipline-specific terminology, and symbolic notation, and limited proficiency in any of these components can hinder comprehension (Zakariya, 2022).

Empirical studies consistently show that language proficiency predicts success in word-problem tasks, and that integrated approaches—combining vocabulary development, contextualized examples, and comprehension strategies—improve performance (Tañola & Lomibao, 2024). When students cannot integrate prose, symbols, and diagrams into a coherent mental model, they tend to misinterpret tasks and choose incorrect strategies (Stylianides & Stylianides, 2024).

Local and regional studies similarly report persistent difficulties in translating word problems into symbolic representations, revealing that comprehension—not merely computation—is a primary barrier to successful

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problem solving (Tañola & Lomibao, 2024; Zakariya, 2022).

Teachers play a central role in identifying representational gaps and assisting students in bridging them through explicit vocabulary instruction, the modeling of varied solution pathways, the use of manipulatives, and guided practice (Stylianides & Stylianides, 2024). These approaches enhance representational flexibility and help students plan and execute solutions more effectively.

Teaching Strategies

Instructional practices significantly shape students' engagement and success in problem-solving. Research emphasizes the value of student-centered, language-responsive strategies that build conceptual understanding rather than relying solely on rote procedures (Zakariya, 2022; Stylianides & Stylianides, 2024). Instruction that integrates vocabulary development, collaborative problem solving, and contextual tasks leads to higher gains on word-problem assessments (Tañola & Lomibao, 2024).

In the Philippine context, traditional approaches remain common, but professional development initiatives reveal that reflective and linguistically sensitive pedagogies improve problem-solving performance. Effective strategies include contextualizing tasks in students' lived experiences, designing activities that encourage mathematical discourse, and providing scaffolds that guide students from comprehension to

symbolic representation and final solution steps (Stylianides & Stylianides, 2024; Zakariya, 2022).

Literature acknowledges that problem-solving difficulties emerge from multiple, interacting factors—language barriers, prior knowledge gaps, representational challenges, and instructional design—and recommends integrated interventions targeting all these areas (Tañola & Lomibao, 2024).

Theoretical Lens

This study is guided by the following theoretical perspectives: Constructivist Learning Theory, Metacognitive Theory, and Language-Based Learning Theory.

In constructivist Learning Theory, it posits that learners construct meaning through active engagement and interaction with problems; difficulties therefore often reflect gaps in prior knowledge and conceptual connections. Furthermore, metacognitive theory highlights the role of planning, monitoring, and evaluating one's own problem-solving strategies; students with limited metacognitive skills often struggle to navigate multi-step mathematical tasks. Meanwhile, Language-Based Learning Theory emphasizes the impact of vocabulary, syntax, and linguistic comprehension on students' ability to interpret and solve mathematical word problems. These frameworks clarify how cognition, language, and learning environment interact to shape students' problem-solving experiences.

Purpose of the Study

The purpose of this phenomenological qualitative study is to describe the difficulties of the students in solving mathematics worded problem in a public school in Digos City, Davao del Sur. Specifically, it sought to ask the following research questions:

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1. What are the difficulties of the students in solving mathematical problem?
2. What are the teaching strategies of the teachers in the student's difficulties in solving mathematical problem?
3. What are the coping mechanisms of the students in their difficulties in solving mathematical problem?

2. Materials and Methods

2.1. Research Design

The study used a qualitative descriptive phenomenological research design to explore participants' lived experiences of engaging with mathematical problem solving (Finch & Smith, 2020). Phenomenology foregrounds first-person accounts and seeks to describe the essential structure of an experience as reported by those who lived it (Finch & Smith, 2020). The researchers positioned themselves as facilitators of rich description while practicing reflexive bracketing to reduce the influence of preconceptions (Braun & Clarke, 2021).

2.2. Respondents and Sampling Procedure

Participants were selected through purposive sampling based on predefined inclusion criteria that ensured relevance to the phenomenon under study. This sampling method was utilized to ensure that participants possessed direct experience with mathematical problem solving, allowing the researchers to gather detailed and meaningful insights consistent with phenomenological inquiry. Further, the criteria included: (a) mathematics teachers at Digos City National High School who hold a bachelor's degree with a mathematics specialization, and (b) Grade 8 and Grade 10 students currently enrolled in mathematics classes at the same school (Palinkas et al., 2019). The final sample comprised ten mathematics teachers, who participated in individual key-informant interviews, and fourteen students, who joined two focus group discussions. This sample size

was deemed appropriate for phenomenological inquiry, which prioritizes depth of insight over numerical breadth, and was sufficient to generate information-rich, detailed accounts of the participants' lived experiences (Patton, 2015).

Data collection was conducted within the school premises—specifically in quiet and private spaces such as vacant classrooms, the faculty room, and the student lounge—to promote comfort, confidentiality, and open sharing of experiences (Finch & Smith, 2020). Recruitment proceeded iteratively and continued until practical saturation was achieved—that is, the point at which additional interviews no longer yielded new experiential insights or meaningful variations in the emerging themes, and incoming data primarily confirmed what had already been articulated by earlier participants (Saunders et al., 2018). This process ensured that the dataset was sufficiently rich and comprehensive for rigorous phenomenological analysis.

2.3. Research Instruments

A semi-structured interview guide with a priori question categories aligned to the research questions was used for both key-informant interviews and focus group discussions. Interviews began with descriptive, nonthreatening prompts and progressed to deeper probes to elicit rich, reflective accounts, consistent with best practice for qualitative

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interviewing (Gill et al., 2018; O'Brien et al., 2018).

2.4. Data Collection and Analysis

Data were gathered through individual key-informant interviews (KII) with mathematics teachers and focus group discussions (FGD) with students. The use of both individual and group methods enriched the dataset by capturing reflective, personal accounts alongside interactive, dialogic constructions of meaning (Lambert & Loisele, 2018; Nowell et al., 2017). All interviews and FGDs were audio-recorded with participants' consent and transcribed verbatim (O'Brien et al., 2018).

This study followed Husserlian descriptive phenomenology, which emphasizes describing the essence of participants' lived experiences. In line with this tradition, the researchers engaged in reflexive bracketing, intentionally setting aside prior assumptions to avoid imposing interpretations on participants' narratives. Reflexivity was maintained through a structured reflexive journal, documentation of analytic decisions, and regular peer-debriefing sessions—practices that helped mitigate potential bias arising from the researchers' multiple roles as facilitators, interviewers, transcribers, and analysts (Braun & Clarke, 2021; Patton, 2015).

Thematic analysis was conducted following Braun and Clarke's (2021) systematic phases: familiarization, initial coding, theme generation, reviewing, defining, and reporting. Coding was performed manually to allow close immersion in the data. Significant statements were extracted, compared, and clustered into formulated meanings, which were further organized into higher-order themes using matrixing techniques

linking verbatim excerpts to emerging interpretations (Andersen & Spencer, 2002).

To strengthen trustworthiness, the study applied strategies across the four criteria. Credibility was supported through member checking, where participants were invited to validate or clarify preliminary interpretations. Dependability was ensured by maintaining an audit trail of decisions related to transcription, coding, and theme refinement. Confirmability was reinforced through reflexive journaling and peer review of analytic outputs, helping minimize researcher bias. Transferability was addressed by providing thick, contextual descriptions of participants, settings, and processes (O'Brien et al., 2018; Nowell et al., 2017). Ethical procedures such as including informed consent, confidentiality safeguards, and secure storage of data, were strictly observed throughout the study.

Results represent participants' experiences as expressed during interviews and focus groups and are presented according to the major themes that emerged from the analysis, supported by illustrative participant quotations and integrated with relevant literature (Braun & Clarke, 2021; O'Brien et al., 2018).

2.6. Ethical Considerations

Before data collection, we obtained institutional permission and secured voluntary, informed consent from all participants; participants received clear explanations of the study's purpose, procedures, risks, benefits, and their rights, including the right to withdraw at any time without penalty (O'Brien et al., 2018; GOV.UK, 2025). Consent included permission to audio-record interviews and to use anonymized quotations in reporting. All

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identifying information was removed or pseudonymized in transcripts and reports to protect confidentiality (GOV.UK, 2025).

We protected participant welfare by scheduling interviews at convenient times and in private, comfortable locations and by monitoring for signs of distress during interviews, pausing or stopping when participants indicated discomfort (McLeod, 2024; GOV.UK, 2025). Data security procedures included encrypted storage of audio files and transcripts, restricted access to identifiable materials, and retention of signed consent forms in locked research records in

accordance with institutional policies (GOV.UK, 2025).

Ongoing consent and transparency were practiced by offering participants access to the study's findings and by inviting corrections to their own quotes or summaries during the member-check process (O'Brien et al., 2018). The research followed applicable institutional ethical approval processes and adhered to contemporary guidance for ethical conduct in qualitative research (O'Brien et al., 2018; McLeod, 2024; GOV.UK, 2025).

3. Results

After conducting the interviews, the data were gathered from the viewpoint of teachers and students using thematic analysis and the results were presented into two clusters based on the three research questions. First, is the discussion on the dilemmas of the students in solving mathematics problem, which showed their reasons behind their difficulties. Second, is on the strategies used by the teachers and third, the students' coping mechanisms to help them overcome their struggles in solving mathematics problem.

3.1 Difficulties of the Students in Solving Mathematics Problem

In order to draw out the difficulties of the students in solving mathematics problem, sub-questions were asked to the teachers and the students. They were specifically asked of the following: struggles of students in solving mathematics problem, possible reasons behind the struggles of students in solving mathematics problem, instances where the students struggled in solving mathematics problem and strategies used by the teachers and students to help the latter overcome their struggles in solving

mathematics problem. Using the example of Braun and Clarke, 2021, we grouped significant statements with similar meanings leading to the crafting of formulated meanings. Formulated meanings were used as part of the introduction in the result and in the discussion part. Out of the formulated meanings, eight themes from the teachers and students' views were drawn. These are lack of comprehension, inability to translate, dislike of mathematics subject, unprepared students, poor memorization, and ineffective teaching.

3.1.1 Lack of Comprehension.

One of the difficulties of the students in solving mathematics problem is the lack of comprehension. They have experienced difficulties in answering problems because they do not understand the problem or the question itself. Sometimes, students do not understand what they are reading. This lack of comprehension includes misinterpretation of the problem and the unfamiliar context in the problem.

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3.1.1.1 Understanding the Problem Challenge.

One of the factors they shared is how the problem is constructed, which is in English. The language used in constructing the problem confuses students in comprehending it. Most of the students lack comprehension especially in understanding and comprehending mathematical concepts. It is one of the common reasons why students have struggled and cannot answer mathematics problems. In fact the misinterpretation of the problem was shown based from our interview with the mathematics teachers. Most of the students have struggled in interpreting and conceptualizing mathematical problems. It is very hard for them to interpret and analyze the content and meaning of the given problems. “In interpreting the problem, they have difficulty in understanding the problem itself” (KI 1, Q.1.1). Students have experienced difficulties in understanding what is asked and given in the problem. It is manifested by another participant when she said, “they don’t know is being asked” (KI 6, Q.1.1). Students are not able to answer a mathematical problem when they do not know what is being asked in the problem. Moreover, it will result to students’ difficulty in formulating the possible equation or solution to the mathematical problem.

3.1.1.2 Unfamiliar context or terms.

For the students, unfamiliar context used in the problem hinder their abilities to understand the problem and therefore failed to solve it. It is manifested by some student participants who claimed that, “We lack of information about the problem.” (FGD 1, Q.1.1). Students with limited knowledge about the topic will not really get the answer of the problem. If this is the case then the students will not really solve a certain problem. In fact one participant said that, “... wala pa sa

vocabulary sa students ang formula or ang question nga gihatag sa teacher” (We have not encounter yet the formula or the question or it is not present yet in the vocabulary of the students the formula or the question that the teacher gave) (FGD 1, Q.1.2). The students had not yet encountered some terms used in the problems, therefore they lack of information about it. Another student participant supported this when he said “Sometimes we do not understand the question because in our life we cannot encounter the question or we are not familiar of that kind of problem” (FGD 1, Q.1.1). This statement means that familiarizing the terms or the contexts used in the problems is important for the understanding of the students and for them to be able to solve a certain problem.

3.1.2 Translation Difficulties.

It is also presented that the students have difficulties in solving mathematics problems in terms of translating mathematical phrase into equation or vice versa. They have difficulty in translating mathematical expressions into equation which will lead them to solve a certain problem. In fact one participant said, “They cannot translate a simple expression...” (KI 5, Q.1.3). Sometimes, students are also not familiar with the expression given. They cannot really get the correct equation without understanding the meaning of the terms in the expression. One participant even said that, “Student has difficulty in translating and understanding more than and less than” (KI 1, Q.2.1). It is very common to the students who have not acquainted with the mathematical phrases and its possible translations. It is very important to familiarize first the equivalent of those mathematical phrases to successfully solve mathematics problem.

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3.1.3 Dislike of Mathematics Subject.

One of the most common reasons why students have struggles in solving mathematics problem is the mindset that the subject is really difficult. They have not tried to solve it yet, but they already make a conclusion that they cannot solve it. It was manifested when one participant said “The dilemma is that usually students don’t like mathematics because they think mathematics is too hard, it’s too difficult” (KI 4, Q.1.1). And this statement was supported by another participant when he said “Most students in reality did not love math subject” (KI 10, Q.1.1). Students are taken by their belief that it is impossible for them to successfully answer the problem. Sometimes, one’s own thought will hinder their ability to do one thing.

3.1.4 Preparation and Focus Issues

Unprepared students.

As a student, being ready is better than being passive. However, also as a student, it is not avoidable that sometimes we will experience being passive, but not in a sense that we do not care, instead it is a kind of passiveness that we become blank because of not being prepared.

3.1.4.1 Study habits/preparation. Students who do not review or prepare for class face difficulties during problem-solving. Attending school is like going to a mission where one must be well prepared and ready for any instances that may come in the way like quizzes and examinations. When a student is not prepared, then it is a disadvantage on the student’s part. Like for example, a student participant said, “Abi nimo dili mag-exam dili ka mag-study. Inig mag-summative test kay malibog naka unsaon to” (You thought there is no exam, then you did not study. In summative test you get confuse how to do it) (FGD 1, Q.1.3). It always happens

in the classroom that while the teacher is discussing the students have other businesses with their seatmate. Another thing is when a student did not review his past lesson. This is confirmed by another student participant when he said, “Kanang wala gani ka nagreview sa equation. Unya during solving wala naka kabalo unsay buhaton na, unsay tama” (That time when you did not review the equations. Then during the solving you did not know what to do, what is right) (FGD 2, Q.1.3). The lack of preparation of the students to attend the class may lead them have unfocused students.

3.1.4.2 Attention/focus.

Moreover, attention is one of the important factors for the students to successfully solve mathematics problem. During discussion, some of the students are thinking of so many things instead of focusing to the lesson. There are many factors that influence them not to listen to the discussion. In fact one participant said, “They have so many things in their mind” (KI 3, Q.1.2). One participant also said, “Instance is that the child mindset is not ready” (KI 4, Q.1.3). On the students’ part, they cannot focus due to some things in their mind. For example, a student participant said, “Kung magsabay-sabay ang mga projects, assignments, ug quizzes, mao nay babag sa akua kay maglisod naman ko ug focus” (That is why when all projects, assignments and quizzes came all together it becomes a hinder to me because I will lose my focus) (FGD 2, Q.1.3). The load of school requirements distracted students to focus on classes. They are so worried on complying their requirements that they neglected listening to their teacher while the class discussion is still going on. Because of this, the students could not

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concentrate as what another student participant had confirmed when he said, “Dili ka ka-concentrate” (You cannot concentrate) (FGD 2, Q.1.2). It is really a disadvantage for students since they will be left behind in the discussion and therefore, could not learn.

3.1.5 Memory Issues.

In problem solving, in order to formulate an equation, the given or what is asked on the problem must be the first concern of the solver. This is due to the fact that one cannot solve a problem without an equation and this equation will in turns become the bases of the formula that must be used in solving. However, mathematical problems consist of many mathematical concepts and sometimes the application of these concepts in a word problem used a variety of formulas based from each concept. Memorization of the formulas is the common problem among the students on solving mathematical problem. In fact a student participant had confirmed it when she said, “Kanang dili kaayo mamemorize ang formula ug ang pag-solve malibog” (When the formula is not memorized well and in solving there is confusion) (FGD 1, Q.1.1). This is supported by another student participant in his statement, “Lisod mag-memorize sa mga formula ug sa mga equation, malibog ka” (It is hard to memorize the formulas and in the equations, you will be confused) (FGD 2, Q.1.1). The students often get confused on what formula to use in a certain problem and not all formula can be instilled in their minds.

3.1.6 Instructional Issues.

Some student participants also said that, one of the reasons why they cannot understand the discussion of solving mathematics problem is the way of the teacher in teaching the lesson. How the teacher taught their students may vary

from teacher to teacher based on their own perspective on teaching. When the teacher teaches his/her students with urgency without even considering whether the students understand the discussion or not, then the learning of the students will be jeopardized. For instance, when one student participant said, “Usahay kanang dili tarungon sa maestra” (Sometimes the teacher did not teach well) (FGD 1, Q.1.2). This is also supported by another student participant when he said, “Usahay paspas kaayo ang pagtudlo sa teacher dili dayon nimo masabtan ug dali” (Sometimes, cannot listen very well and sometimes the teaching of the teacher is very quick, you cannot understand immediately) (FGD 2, Q.1.2). Instead of learning, the students may become more confused than they have been before. Under this ineffective teaching is the unmanaged classroom.

The classroom conditions or management affects students’ ability to learn. It will hamper students learning especially when students could not listen well during discussion because of the noise. When there is no more classroom management inside the classroom during the discussion, the students in the back will really suffer since it would be impossible for them to hear anything from the front. This was confirmed by the student participant when she said “Usahay saba dili ka makapaminaw ug tarong” (Sometimes noisy you cannot listen well) (FGD 1, Q.1.2). This is supported by another participant when he said, “Kung layo ka sa teacher, kung mag-lesson maglisod ka ug dungog” (If you are far from the teacher during discussion you cannot hear very well. So, you would really struggle on solving since there are difficulties in the steps) (FGD 2, Q.1.2).

3.2 Teaching Strategies of the teachers to help the students overcome their difficulties

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Informants were asked about their teaching strategies and the students were grouped and asked about their coping mechanism to help the latter overcome their struggles in solving mathematics problem. For other teachers, they suggested the following: varied methods, vernacular translation and motivation is the important factor to cope with their difficulties in solving mathematics problem.

3.2.1 Varied methods.

Teachers present different ways of discussion in order to help the students overcome their struggle in solving mathematics problem. They will give variety of teaching styles and different learning activities that will really enhance the solving skills of the students. It is one way of assessing the learning of the students and knowing what kind of teaching strategy will be effective to the learners. It was supported by the statement of one participant, “we need to find other strategies in which the given problem will be solved by them” (KII 1). Through various ways of presenting the solution of the problems or the ways of how to solve it, students can find convenient way in answering different kind of mathematical problems. It will also catch the interest of the students since the teachers bring something new in the classroom. Students will be motivated to learn more and understand more the problem to come up with the correct answer. This includes tutoring, introducing shortcut method, discovery method, review and group activity.

3.2.1.1 Tutoring is a way of scaffolding on which students will be taught by the more knowledgeable others.

This is suggested by one participant in her statement, “Tutoring during vacant time” (KI 4 Q.2.2). It is also a great avenue for the students to ask and clarify about the things that they have

not understood. It was also supported by one participant as he said, “For me, it would be better to go to them, monitor them, and tap them.” (KI 1, Q 2.3). It will help the students correct their misconceptions about the problem. Another thing is introducing shortcut methods which are very effective to solve problems in an easier and a convenient manner. In fact, one participant said, “Teach them with techniques to make the process of solving easier.” (KI 1, Q.2.3). Another participant also shared his method in teaching his students to solve problems in mathematics. He said, “Singaporean method or sometimes or localized as tinamban method” (KI 9, 2.2). Shortcut method like the Singaporean method is very useful for the students to check and evaluate their answer. This teaching strategy is supported by the students when they said, “Magbuhat ug ilhanan or shortcuts sa formula” (Make a clue to the formula of a problem) (FGD 1, Q.3.1). This statement is also supported by another participant when he said, “Maggamit ug mga shortcut methods” (Use shortcut methods then ask again the teacher) (FGD 2, Q.3.2).

One teaching strategy also came up when a participant suggested that, “One is discovery method...” (KI 4, Q.2.2). It is very effective for them to let the students discover learning and to be engaged in learning itself. In fact a teacher even said that, “They must be on hand and let them discover, then you will be the one to process or reinforce their learning” (KI 1, Q.2.2). Learning will last longer if you are on hand in discovering the answer of a certain problem. It will also be significant if you are the one who will really discover the answer to the question.

3.2.1.2 Review is also used by the teacher as teaching strategies to help the students

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overcome their struggles in solving mathematics problem.

It is a great help for the students to recall the basic concepts which are useful in their present topic in mathematics. It is also one way of refreshing their minds about their past lessons especially in elementary years. In fact, one participant said, “We must start recalling some basic concepts first in order to constantly reminding them to what extent are those concepts valued much” (KI 8, Q.2.2). In addition, one participant also asserted, “I need to review them of those aspects they needed to solve the problem” (KI 3, Q.2.1). It is also one way of refreshing their minds about their past lessons especially in elementary years. In reviewing, students can ask the teachers for some clarifications which are very helpful for them to really understand the topic properly.

3.2.1.3 Group activity is a great avenue for the students to exchange their ideas and knowledge about the problem.

In fact a participant even mentioned, “I really introduce group activity in their seats. I used to have groupings so that they could exchange their ideas one at a time.”(KI 4, Q.2.2). Through group activities, students will be able to share what they have learned to others especially to those who have not clearly understood the concept. Another participant even suggested other types group activities as she said, “Techniques liked, having a dyad activity, peer discussion, group discussion, game/puzzled activity, and student-to-student interaction form them to clearly express their own level of understanding” (KI 8, Q.2.2). It is a big help for them to discuss things and interact with their classmates.

3.2.2 Vernacular Translation.

Translating the problem is one of the teaching strategies used by the teacher to help the students overcome their struggles in solving mathematics problem. In fact, one participant asserted, “Translating the problem/ instruction into vernacular so that they will understand easily” (KI 2, Q.2.1). Teachers used it to help the students understand more the problem or the instruction in a convenient manner for the students. If the teacher will not translate the problem, students will struggle in understanding the content or the message of the problem. One participant even said, “Una nila pagsabot sa problem, i-translate sa nila sa local nila na language para masabtan nila” (Before they understand the problem, they will translate it first into their local language) (KI 9, Q.2.2). The very point of translating is to support and help the students in understanding the problem.

3.2.3 Motivation.

As a teacher, encouraging the students will help them not to give up in getting the answer. It serves as reinforcement to them. As a teacher, you must always guide your students on how to solve the problem and never discourage them. As stated by one participant, “Just encourage nga that’s part of their growing nga ma-increase ilang mental ability in solving problems then ang mathematics is that it is not only for mathematical ability but it is a way of decision making in someday, somehow because quantitative, qualitative reasoning ang maguwas ana”(Just encourage that that is part of their growing will increase their mental ability in solving problems then mathematics is not only for mathematical ability but it is a way of decision making in somebody, somehow because quantitative, qualitative reasoning will come out on that) (KII 9, Q.2.1). Let them realize that learning mathematics is very beneficial in our lives. Problem solving does not

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mean you have solved a problem only but it will help you enhance your comprehension and thinking skills. Teachers should be positive on teaching their students as what one of our participant said, “The teacher should have a positive outlook towards the subject and his/her students by doing so, he/she could influence the students to love the subject.” (KI 10, Q.2.1).

3.3 Coping Mechanisms of the students to overcome their difficulties

Participants were grouped and asked about their coping mechanism to overcome their difficulties in solving mathematics problem. They point out personal responsibilities as their main platform to overcome their difficulties.

3.3.1 Personal responsibilities.

Every student has the responsibility to take towards learning. His/her responsibilities include asking the teacher, studying hard, being optimistic, paying attention, and memorizing. Asking those who knew better will help someone to learn. This is to have reinforcement for the students’ learning. As a student, it is their right to ask questions to the teachers to clarify what concept that confused them. For the students, this is one way of learning when they said, “Kung naa kay wala kaayo nasabtan sa pagtudlo, mangutana lang ka para mausab ug tudlo” (If there is something you do not really understand in way of teaching, just ask so that it will be discuss again) (FGD 2, Q.3.1). This is supported by another participant when she said, “Mangutana kay teacher kung dili ka-gets” (Ask the teacher if you did not get it) (FGD 1, Q.3.2). By this way the students will be given the opportunity to learn when they did not get it on first attempt.

The major role of a student is to study and learn. When a student studies his/her lesson, he/she learned more. Every student should be responsible in his/her study and help themselves by making a research for their lesson. This is true to them when the student participants affirmed this by their statements. One student participant said, “Magstudy kung unsaon unya magresearch” (Study on how to get it and make a research) (FGD 1, Q.3.1). Another participant said, “Study the formula. Studihan lang jud nimo ang lesson” (Study the formula. You just have to really study the lesson) (FGD 2, Q.3.2).

3.3.2 Optimism and Attitude.

Encouraging one’s self to love math even if it is difficult and not easy to comprehend, is one way of showing one’s determination to learn. It shows optimism in the part of the students to do this step in learning mathematics, particularly in problem solving. This manifested by the students when one student participant said, “I-love lang nimo ang math. Kung love nimo ang math, naa man nay passion diha, nay possibilities na mag-study na ka ug taman, mag-copy naka ug taman, unya maka-solve ug taman” (You just have to love math. If you just love math, there would be passion in it, there would be a possibilities that you will study hard, copy hard and solve hard) (FGD 2, Q.3.1). Another student participant also supported this when she stated, “Dapat ibutang sa imong utok na challenge na siya nga dapat nimo i-overcome” (You should put in mind that it is a challenge that needs to overcome) (FGD 2, Q.3.1).

Whenever the teacher is in front discussing the lesson, students should pay attention for them to be able to learn the concepts in mathematics and answer the questions of the teacher, especially in problem solving. Students nowadays have very

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short attention span and paying attention is very important in the classroom. This had been admitted by the students themselves and even suggested this coping mechanism. They even said “Maminaw jud sa teacher para ma-answer ang mga question” (Listen intently to the so that the question will be answered) (FGD 1, Q.3.2) and is supported by other participant when he said, “Maminaw jud ka ug taman a teacher” (You should really listen to the teacher) (FGD 2, Q.3.2).

Since there are many formulas in math, memorizing these formulas is very important. It may be a hassle but they are very useful especially in solving mathematics problem, at least memorize the basic formulas. The students suggested this since they themselves had struggled in solving mathematics problem because they do not memorize the formulas of math concepts. “Memorize the formula” (FGD 2, Q.3.2) is the common statement of the student participants.

4. Discussion

This study investigated the difficulties of students in solving mathematics problems, the teaching strategies employed by teachers, and the coping mechanisms students use to overcome these difficulties. The findings are significant not only for students and teachers but also for us as future mathematics educators. The challenges in problem solving identified in this study reflect a global phenomenon. Research in countries such as Malaysia emphasizes problem solving as a central aspect of the mathematics curriculum, involving the integration of multiple concepts, skills, and decision-making processes (Stylianides & Stylianides, 2024). Despite this, students continue to experience difficulties in solving mathematical problems, highlighting the universality of the issues explored in this study.

4.1 Comprehension and Translation

Challenges

The lack of comprehension emerged as a major difficulty among students. Students often struggle to understand the problem, misinterpret key terms, and fail to organize information effectively. Similar findings have been reported in Thailand, where poor reading comprehension prevented students from accurately processing

essential information and translating it into mathematical symbols (Tañola & Lomibao, 2024). Mathematics language, which combines ordinary English with specialized terms, may further hinder comprehension, particularly in word problems (Bouck, Smith, & Park, 2023). Consequently, students may generate solutions that are inconsistent with the intended answer (Stylianides & Stylianides, 2024).

Language proficiency appears to be a significant factor, as limited vocabulary and reading skills impede understanding (Tañola & Lomibao, 2024). Additionally, unfamiliar contexts or terms such as “volume,” “factor,” or “denominator” may confuse students, thereby increasing their difficulty in solving problems accurately.

Closely related to comprehension issues is the inability to translate mathematical phrases into equations. Translation errors can lead to incorrect solutions, especially in operations that are non-commutative, such as subtraction and division (ICEEP, 2024). Therefore, familiarizing students with mathematical terminology and its equivalent symbols may support problem-solving success.

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4.2 Attitudinal and Motivational Factors

Students' attitudes toward mathematics, including dislike of the subject, negatively affect their problem-solving performance. A negative mindset may reduce engagement and willingness to attempt problems (Zakariya, 2022). Such beliefs may result in self-imposed barriers, limiting students' capacity to solve even basic problems. This aligns with studies indicating that learners' perceptions and feelings about mathematics strongly influence their achievement.

4.3 Preparation, Attention, and Memory

Unpreparedness in attending class and insufficient study habits emerged as another significant factor. Students who fail to review lessons or come to class unprepared often struggle to keep up with discussions, resulting in diminished focus and learning (Bouck et al., 2023). Attention deficits were also highlighted, with students reporting that distractions or multiple academic demands interfere with concentration (Tañola & Lomibao, 2024). Poor memorization of formulas and concepts was similarly cited as a barrier. Effective problem solving often requires recalling multiple mathematical concepts, yet rote memorization under time pressure can hinder retrieval and application (Zakariya, 2022).

4.4 Instructional and Classroom Factors

Ineffective teaching and classroom management further exacerbate students' difficulties. Rapid instruction, unclear explanations, and unmanaged classroom environments may impede comprehension and focus (Lambert & Loiselle, 2018; Bouck et al., 2023). Conversely, effective classroom management promotes engagement and minimizes disruptive behavior, supporting better problem-solving outcomes (O'Brien et al., 2018).

To address these challenges, teachers in this study employed a range of strategies. Tutoring, whether peer-assisted or teacher-led, scaffolds learning and enhances conceptual understanding (Tañola & Lomibao, 2024; Stylianides & Stylianides, 2024). During class, varied teaching methods—such as discovery-based learning, shortcut techniques, reviews, and group activities—help maintain engagement and support skill development. Translating problems into the vernacular was particularly useful for students facing language barriers, enabling comprehension and solution construction. Furthermore, motivating students and fostering a positive classroom climate helps capture interest and sustain engagement (Zakariya, 2022; Yang, Maeda, & Gentry, 2024).

4.5 Students' Coping Mechanisms

Students' personal responsibility plays a critical role in overcoming difficulties. Strategies such as actively asking questions, studying diligently, paying attention, memorizing formulas, and maintaining a positive attitude were cited as effective coping mechanisms. These behaviors support persistence, engagement, and achievement in mathematics (Alreshidi, 2023). Encouraging students to take ownership of their learning is therefore an essential complement to teacher-led strategies.

4.6 Implications for Practice

The findings of this study suggest several practical implications for mathematics education. Teachers should consider employing a variety of instructional strategies that address comprehension and translation difficulties, such as vernacular translations, discovery-based learning, scaffolding, tutoring, and group activities. Classroom management should be prioritized to minimize distractions and promote

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sustained attention, enabling students to engage more effectively with problem-solving tasks. Teachers should also foster positive attitudes toward mathematics through motivation and reinforcement, as learners' beliefs and interest significantly influence engagement and performance. For students, taking personal responsibility for learning, including reviewing lessons, memorizing formulas, asking questions,

5. Conclusions

This study explored the lived experiences of students and teachers regarding difficulties in mathematical problem solving. Findings revealed several essential themes shaping students' challenges: (1) limited comprehension of word problems, (2) difficulty translating mathematical language into symbolic form, (3) low confidence and affective barriers, (4) instructional practices that do not consistently support conceptual understanding, and (5) variable home and school support systems.

Students' struggles were most strongly associated with language-related challenges, including unfamiliar mathematical vocabulary and difficulty interpreting problem statements. These comprehension barriers, compounded by gaps in prior knowledge and inconsistent focus during lessons, reduced students' accuracy and confidence in problem solving. Teachers also noted that students' affective factors—such as anxiety and low self-belief—further hindered persistence during complex tasks.

Despite these challenges, students demonstrated several effective coping mechanisms, such as seeking clarification, practicing independently, collaborating with peers, and adopting more positive attitudes toward mathematics. Teachers likewise employed various strategies, including

and maintaining a positive mindset, is crucial for developing problem-solving skills. The study highlights that effective mathematics instruction requires an integrated approach that considers cognitive, affective, and behavioral factors, emphasizing the collaborative roles of both teachers and students in enhancing problem-solving competence.

simplifying language, using multiple representations, and contextualizing problems, which supported students' engagement and improved understanding.

Hence, the findings affirm that problem-solving difficulties arise from interconnected cognitive, linguistic, instructional, and affective dimensions, and that targeted support across home and school environments can help students overcome these challenges.

Recommendations

For Students. Students should actively engage in problem-solving practice and utilize strategies such as peer collaboration, clarification-seeking, and deliberate practice of vocabulary and translation skills. Developing persistence and metacognitive awareness can support improved comprehension and more effective solution planning.

For Teachers. They are encouraged to strengthen language-sensitive instructional strategies, including explicit vocabulary instruction, modelling multiple representations, and scaffolding the transition from problem comprehension to symbolic formulation. Providing opportunities for exploratory and collaborative problem solving may enhance students' confidence and conceptual

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understanding. Awareness of cognitive, affective, and metacognitive influences on learning is essential for designing responsive instruction.

For the Academe. Schools should foster supportive learning environments by offering structured interventions focused on comprehension, translation skills, and foundational concepts. Programs that allow students to demonstrate mathematical understanding through varied modalities may help address diverse learning needs. Sensitivity to students' difficulties—and avoiding negative labeling—should be emphasized in professional development sessions.

6. Limitations of the Study

This study was limited to the experiences of selected Grade 8 and Grade 10 students and mathematics teachers from a single public high school in Digos City, Davao del Sur. As such, the findings reflect the perspectives of participants within this particular context and may not be generalizable to other schools or populations. Because the study relied on self-reported data gathered through interviews and focus group discussions, the results were dependent on participants' willingness to articulate their experiences fully and accurately. Social desirability bias may have influenced some students to present themselves in a more positive light or minimize their difficulties,

For Parents. They can support children by monitoring school progress, assisting with homework when possible, and providing encouragement to sustain engagement in mathematics. A supportive home environment contributes to students' confidence and readiness to tackle problem-solving tasks.

For Future Researchers. Further studies may investigate additional factors affecting students' problem-solving difficulties, including cognitive load, reading proficiency, and digital learning tools. Comparative or longitudinal research may also extend understanding of how these challenges evolve across grade levels and instructional contexts.

while the inherent limitations of self-reporting—including selective memory, subjective interpretation, and recall bias—may have shaped the narratives provided. Data collection occurred in mixed languages (English, Filipino, and vernacular), and subtle nuances may have been affected during translation or transcription. Although reflexive practices and trustworthiness procedures were implemented, the researcher's interpretation may still have introduced minor biases. Future research using larger and more diverse samples, triangulated data sources, or mixed-method designs could enhance the transferability and confirmability of the findings.

Author Contributions:

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Supplementary Details

Supplementary Materials & Data Availability Statement

Supplementary materials, including the thematic analysis table are available for download at the following

link: https://drive.google.com/file/d/1ckspCJrsssCfKo38G1-OTE_tdOsUguCW/view?usp=share_link All data supporting the findings of this study are included in the article and its supplementary files.

Author Contributions (CRediT Taxonomy)

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