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Learners' Problem-Solving Skills and Mathematics Performance

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Abstract:

Problem-solving constitutes a fundamental element in the study of mathematics. The study aimed to determine the problem-solving skills and mathematics performance of learners in one of the elementary schools of a first-class municipality in Central Visayas during the school years 2024-2045. Descriptive research was conducted, and a 50-item test questionnaire was used to assess the problem-solving skills of 60 learners. The results revealed that most respondents were males with higher educational backgrounds and parents, and belonged to a higher family income. Overall, the level of learners' problem-solving skills was moderate. The level of learners' mathematics performance was satisfactory. Male learners' problem-solving skills level was moderate, while that of females was high. Learners ' problem-solving skills level was moderate when grouped according to parents' highest educational attainment and average family monthly income. A significant difference was found in the level of learners' problem-solving skills in all three areas when comparing the variable sex. Moreover, a significant difference was found in the learners' mathematics performance level compared by sex. Further, a significant relationship was found between the learners' problem-solving skills and mathematics performance. It is concluded that the better the problem-solving skills, the higher the performance obtained by learners in mathematics. This calls for mathematics supervisors and school heads to provide adequate teaching and learning resources for teachers, give professionals support, and organize training and workshops to help teachers improve problem-solving skills among learners.

Keywords: Learners, mathematics' performance, problem-solving skills,

Introduction:

Nature of the Problem

As demonstrated by the declining performance of Filipino students in national and international assessments over the past 20 years—the Philippines was ranked 54th out of 63 economies in the 2022 World Talent Ranking—learners' performance in mathematics has become a significant challenge in Philippine settings. According to the World Competitiveness Centre of the International Institute for Management Development (IMD), pupils perform worse and severely lack problem-solving abilities (Ibanez, 2020).

Solving problems is a crucial ability that everyone needs. Students who practice problem-solving in mathematics gain experience using their mathematical knowledge and abilities to solve difficulties in everyday life. Word problem-solving is one of the key elements of mathematical problem-solving that integrates real-world issues and applications (Osman et al., 2018). At the elementary level, word problem solving is difficult and frustrating for many students, particularly in fundamental operations, ratios and proportions, percentage, rate, and simple interest (Habibullah & Hartono, 2019). Students face difficulties understanding the mathematical language, which can lead to misconceptions. In addition, students find it challenging to grasp the problem or some parts because of the mathematical language.

In the present research locale, the researcher observed that many learners have poor performance, particularly in problem-solving skills in mathematics. Most learners memorize existing mathematical rules but cannot apply them to specific problems to find answers due to their low critical thinking ability, resulting in poor mathematics performance. Moreover, many learners have no more profound understanding of mathematical concepts and operations, particularly in multiplication and division.

From this standpoint, the researcher was motivated to conduct this study to determine the learners' problem-solving skills and mathematics performance. The results of this study will help the researcher design and develop learning strategies to enhance the learners' problem-solving skills in mathematics. Hence, it is important to build a good base of fundamental academic skills in math in the early grades to avoid greater learning difficulties in the future.

Current State of Knowledge

Problem-solving skills are essential cognitive abilities that involve identifying, analyzing, and addressing challenges through effective strategies, enabling students to adapt to an increasingly complex world (Sutarno et al., 2017; Fitriani et al., 2020). These skills promote collaboration, critical thinking, and creativity, which enhance students' understanding and prepare them for dynamic work environments. Assessing students' problem-solving abilities can be done through their academic performance, comprehension, and engagement (Melawati et al., 2022). According to Docktor et al. (2016), the process includes identifying, conceptualizing, devising, implementing, and evaluating solutions, which require deep conceptual understanding and advanced cognitive skills (Gunawan et al., 2020). Success in problem-solving depends on understanding the problem, formulating appropriate algorithms, and evaluating the outcomes (Sinaga et al., 2023). In mathematics, problem-solving plays a vital role in improving learning outcomes, as students who effectively apply these skills demonstrate better comprehension and performance (Setiawan & Oka, 2020; Klang et al., 2021; Jusmawati et al., 2021; Wang et al., 2022).

Problem-solving is a vital component of mathematics education, fostering learners' advanced cognitive and critical thinking skills by building on a strong foundation of fundamental principles (Collado, 2023). It equips students to address real-life situations, enhancing creativity and enabling them to view challenges from multiple perspectives (Cambaya et al., 2022). As a subset of critical thinking, problem-solving encourages complex reasoning beyond memorized methods, supporting academic success and confidence (Nicolas & Emata, 2018). However, many students struggle due to limited ability to apply mathematical concepts in new contexts, which hinders performance (Oco, 2022). Addressing these gaps requires educators to understand the factors affecting students' comprehension of word problems and to design effective instructional strategies. Ultimately, problem-solving in mathematics extends beyond the subject itself—it cultivates adaptable thinkers capable of tackling both familiar and unfamiliar challenges with understanding and innovation.

Several studies have examined students' problem-solving abilities and the impact of various instructional methods on their mathematics performance. Ramiro (2024) found that Grade 5 students demonstrated adequate literacy-related problem-solving skills but struggled with numeracy, particularly in linking mathematical concepts and determining appropriate operations. Jimenez (2020) revealed that different teaching approaches—Discovery, Exposition, and Traditional—significantly improved first-year students' problem-solving abilities, though none proved superior, with cognitive domains like comprehension and application influencing outcomes. Cambaya et al. (2022) showed that students' problem-solving skills and engagement levels significantly improved after exposure to Contextualized Instruction, as indicated by higher posttest and retention scores. Similarly, Ermac and Tan (2023) reported that students exposed to the Joint Productive Activity Method (JPAM) exhibited substantial gains in both problem-solving performance and interest in mathematics compared to those taught through non-JPAM methods.

Various studies have explored factors influencing students' mathematical problem-solving skills and performance. Sinaga et al. (2023) found that while gender did not significantly affect problem-solving understanding or learning outcomes, grade level did, and students' problem-solving skills strongly influenced their mathematics results. Osman et al. (2018) showed that using the Bar Model significantly improved students' problem-solving achievement. Amalina and Vidákovich (2023) revealed that demographic factors such as school location, gender, and socio-economic status affect students' mathematical problem-solving abilities, with urban and female students performing better. Similarly, Celemin (2023) and Fauziah and Cahya (2020) noted that students performed above average in basic operations but struggled with multiplication, division, and ratio concepts. Other studies (Hidayati et al., 2019; Mohamed & Elkiat, 2020; Rosidi & Hadi, 2019; Kasturi et al., 2021; Humairah, 2021; Susperreguy & Castillo, 2024) confirmed that females often outperform males, and factors such as parental education, parenting style, and socio-economic background significantly predict problem-solving performance. Suryani et al. (2020) and Sari et al. (2021) further emphasized that high-achieving students effectively understand, plan, and evaluate solutions, whereas lower-achieving students often fail to recheck or reflect on their answers, leading to lower problem-solving accuracy.

Mathematics performance is a key indicator of students' cognitive abilities and academic success, influencing their future career potential and capacity for problem-solving and sound judgment (Szabo et al., 2020). While some learners excel across multiple subjects, others struggle specifically with mathematics due to factors such as learning styles, teaching methods, and the level of support provided (Abu Khurma et al., 2023). Strong mathematical skills enhance analytical thinking and reasoning, fostering cognitive growth and readiness for advanced learning (Chand et al., 2021). Conversely, a lack of math proficiency can lead to anxiety and lower performance, highlighting the need for targeted interventions and supportive, engaging learning environments that build students' confidence and promote positive attitudes toward mathematics (Tanujaya & Mumu, 2022).

The persistent issue of low mathematics performance among elementary and high school students is often linked to inadequate critical thinking and problem-solving skills, as students struggle to analyze, interpret, and evaluate information effectively (Junsay, 2016). According to Segumpan (2023), mathematics performance is shaped by the interaction between classroom instruction, students' perceptions, and teachers' methods. However, a mismatch often exists between how teachers teach and how students learn, which negatively affects outcomes. To address this,

educators must align instructional strategies with students' learning needs and perceptions, fostering a collaborative and engaging environment that enhances mathematical understanding and overall performance.

Grootenboer and Hemmings (2017) found that both dispositional and background factors significantly influence the mathematics performance of children aged 8 to 13, with a combination of these variables effectively distinguishing between below- and above-average performers. Similarly, Kiwanuka et al. (2015) identified multiple predictors of mathematics achievement among Ugandan students at the student, classroom, and school levels, including socio-economic status, gender, prior achievement, parental support, peer influence, classroom climate, and attitudes toward mathematics, all of which collectively contribute to variability in students' performance.

Several studies have explored factors influencing students' mathematics performance. Romano (2021) found that learners generally demonstrated satisfactory performance regardless of sex, parents' educational attainment, or class section, with no significant differences among these variables. In contrast, Lazaroa and Mascuñana (2022) and Gumasing (2021) reported that female students outperformed males, showing greater motivation, adaptability, and academic effort. Abalde and Oco (2023) revealed that students' study habits and learning techniques significantly affect their mathematics performance and attitudes, though study habits were not linked to self-confidence. Similarly, Cabuquin and Abocejo (2023) found a strong positive correlation between mathematics performance and overall academic achievement among junior high school students, suggesting that proficiency in mathematics contributes to success across other subjects, with no significant gender differences observed.

Theoretical Underpinnings

The present study is anchored to Problem Solving Theory by Dostál (2014).
According to theoretical definitions, a problem is any theoretical or practical challenge that makes a subject curious and helps them expand their knowledge. In education, this term refers to a theoretical or practical problem that a student must resolve through active research. Acknowledging progress is part of the problem-solving process. In order for the solution to be successful, the person must observe the results of his or her own actions in each step of the problem-solving process; he or she must confirm whether the action had a beneficial impact on the problem-solving process itself, whether the person is getting closer to the intended goal or further away from it. For a successful problem solution, it is appropriate to plan the particular steps that lead to its successful resolution.

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According to the current study, theory is helpful because it shows students how to approach difficulties methodically, which may result in well-thought-out answers to the arithmetic problems. Additionally, this method helps pupils develop their critical thinking abilities and confidence as they work through challenging mathematical ideas. Students can gain a more profound comprehension and mastery of the subject matter by implementing theoretical frameworks.

Objectives

This study aimed to determine the level of problem-solving skills in relation to the level of learners' mathematics performance in one of the elementary schools of a first-class municipality in Central Visayas during the school years 2024-2045. Specifically, this study sought to answer the following questions: 1) the level of problem-solving skills of the learners in terms of fundamental operations, ratio and proportion, and percentage, rate, and simple interest; 2) the learners' mathematics performance level for the first and second quarters; 3) significant difference in the level of problem-solving skills of the learners when grouped and compared according to the aforementioned variables; 4) the significant difference in the learners' mathematics performance level when grouped and compared according to the aforementioned variables; 5) the significant relationship between the level of problem-solving skills and the level of mathematics performance of the learners.

Methodology:

This section presents the discussion of the research methodology used, the subjects and respondents of the study, the research instruments used, the validity and reliability of the instruments, the procedure for data gathering, and the statistical tools and procedure for data analysis.

Research Design

This study utilized a descriptive research design to determine the level of problem-solving skills in relation to learners' mathematics performance in an elementary school located in a first-class municipality in Central Visayas during the school year 2024–2025. As described by Nachimas et al. (2015), the descriptive design is appropriate for studies that examine current conditions, relationships, opinions, practices, and trends, as well as the extent and direction of behaviors and attitudes. Since this study focuses on understanding existing conditions, comparing variables, and identifying possible influences among them, the descriptive design is deemed suitable for gathering relevant data, analyzing relationships, and providing a basis for professional interpretation and recommendations.

Study Respondents

The respondents of this study were 60 Grade 6 learners officially enrolled during the school year 2024–2025. A purposive sampling technique was employed, allowing the researcher to intentionally select participants who met specific criteria relevant to the study (Ames et al., 2019). This method ensured that the chosen respondents accurately represented the target group needed to address the research objectives. As shown in Table 1, the respondents were evenly distributed between two sections, with 30 learners (50%) from Section A and 30 learners (50%) from Section B, totaling 60 participants.

Instruments

This study utilized a researcher-made questionnaire composed of two parts: the first gathered respondents' personal profiles, including sex, parents' educational attainment, and average family monthly income, while the second assessed learners' problem-solving skills in fundamental operations, ratio and proportion, percentage, rate, and simple interest through six problem-solving items totaling 30 points. Responses were scored using a detailed rubric ranging from 0 (no response) to 5 (unique and accurate solution with clear explanation and verification). To ensure validity, the instrument underwent face and content validation by three experts—a school principal, a university professor, and a teacher experienced in designing mathematics assessments—whose evaluations yielded a validity index of 4.74 (Excellent) based on Carter V. Good and Douglas E. Scates' criteria. For reliability, a pilot test with 30 non-participant Grade 6 learners was conducted, and data were analyzed using the Kuder-Richardson 20 (KR-20) formula, resulting in a reliability coefficient of 0.774 (Good). These results confirm that the instrument was both valid and reliable for data collection.

Data Gathering Procedure

For the smoother conduct of the study, the researcher employed the following procedures. A letter of request addressed to the Schools Division Superintendent for the conduct of the study was submitted for approval. Upon approval, a separate letter was also given to the head concerned. The researcher conducted test questionnaires with the target respondents with the assistance of class advisers. A consent form was also given to the parents to allow their children to be the subject of the study.

The questionnaires were administered during the learners' free time to maintain the schedule of classes. The researcher personally conducted the test questionnaire for the learners with the assistance of classroom advisers. The researcher allotted 45 minutes for the learners to answer all problem-solving questions. After administering the test, the researcher recorded the learners' scores and presented them in tabular form for straightforward interpretation and analysis of the results. In the presentation of data, the researcher followed the table of specifications prepared to provide accurate interpretation and analysis of results.

Data Analysis and Statistical Treatment

Objective No. 1 used the descriptive analytical scheme and mean to determine the level of problem-solving skills of the learners in fundamental operations, ratio and proportion, and percentage, rate, and simple interest.

Objective No. 2 also used the descriptive analytical scheme and mean to determine the level of learners' mathematics performance in the First and Second Quarters.

Objective No. 3 used the comparative analytical scheme and t-test to determine the significant difference in the level of problem-solving skills of the learners when grouped and compared according to the aforementioned variables.

Objective No. 4 also used the comparative analytical scheme and t-test to determine the significant difference in learners' mathematics performance level when grouped and compared according to the aforementioned variables.

Objective No. 5 used the relational analytical scheme and Pearson's r to determine the significant relationship between the level of problem-solving skills and learners' mathematics performance.

Ethical Consideration

The researcher emphasized the respondents' voluntary participation, informed consent, risk of harm, confidentiality, and anonymity to protect the study's participants. In this study, for voluntary participation, the researcher asked respondents to sign or agree to a consent form by filling out a blank line or data entry slot with their initials or an alias. Consent from the respondents' parents was also solicited. After they sign or agree to the consent form, they can withdraw without giving a reason. For informed consent, the research ensured that the respondents were fully informed about the procedures and risks involved in the study, and they must consent to participate. For risk of harm, the researcher did not put participants in a situation where they might be at risk of damage because of their participation. If this happens, the participants can decline to answer all the questions and may withdraw their participation at any time. For confidentiality, the researcher guaranteed that the participants' identifying information would not be made available to anyone not directly involved in the study. Further, for the anonymity of the respondents, the respondents used an alias or initial to keep his/her identity anonymous to the researcher and other participants.

Results and Discussion:

This section deals with the presentation, analysis and interpretation of data gathered to carry out the objectives of this study. All these were made possible by following certain appropriate procedures so as to give the exact data and solution to each specific problem.

Table 1
Level of Problem-Solving Skills of the Learners according to Fundamental Operations, Ratio and Proportions, and Percentage, Rate, and Simple Interest

Areas	Mean	Interpretation
Fundamental Operations	7.33	High
Ratio and Proportions	5.87	Moderate
Percentage, Rate, and Simple Interest	2.02	Low
Overall Scores	**15.22**	**Moderate**

Table 1 reveals the data on the learners' level of problem-solving skills in fundamental operations, ratios and proportions, percentages, rates, and simple interest. The learners obtained an overall mean score of 5.07 and interpreted it as a moderate level. This interpretation entails that the learners exhibit average problem-solving skills.

In fundamental operations, the learners obtained a mean score of 7.33, which was interpreted as a high level. The result implies that most learners exhibit good problem-solving abilities in four fundamental mathematical operations. Most learners' problem-solving skills in addition and subtraction were very good; however, the learners were not good at multiplication and division. This indicates that the learners do not master multiplication and division operations or solve word problems in multiplication and division.

The result is supported by Celemin (2023), who revealed that the learners' problem-solving skills were above average in addition and subtraction. However, the learners fell into the emergent level in terms of multiplication and division because there are still learners who do not master the multiplication and division operations.

In ratio and proportion, the learners obtained a mean score of 5.87, which was interpreted as moderate. The result implies that the learners can only perform simple problem-solving skills in ratio and proportion to a limited extent, due to their lack of a deeper understanding of ratios and proportional relationships. This lack of knowledge may hinder their ability to tackle more complex mathematical problems that rely on these foundational concepts. Consequently, it is essential to implement targeted instructional strategies that promote deeper comprehension and application of ratios and proportions in various contexts. The result is supported by Fauziah and Cahya (2020), who revealed that the students' performance in ratio and proportion was average. The study also identifies three common types of students' difficulties in solving ratio and proportional relationship problems: (1) difficulty in ratio and proportional relationship word problems, (2) difficulty in applying arithmetic operations, and (3) difficulty in understanding the concept of ratios and proportional relationships.

Further in percentage, rate, and simple interest, the learners obtained a mean score of 2.02, interpreted as a low level. The result indicates that the learners demonstrate limited mastery in problem-solving related to percentages, rates, and simple interest. This is because the learners' poor reading comprehension skills regarding mathematical concepts led to most learners being unable to fully grasp the meaning of what was asked in the question, which contributed to their difficulty in successfully solving problems related to percentage, rate, and simple interest. The study indicates that difficulties in understanding mathematical language and concepts may hinder learners' ability to solve related problems effectively. The result is supported by the survey conducted by Sari et al. (2021) on students' mathematical problem-solving skills. Researchers found that students' problem-solving skills in percentage, rate, and

simple interest fell into the fair or moderate category. The research found that students cannot reflect and recheck their answers because they do imperfect preparation in the problem-solving cycle involving percentage, rate, and simple interest.

Table 2
Level of Learners' Mathematics Performance for the First and Second Quarters

Variable	Quarter	Mean	Interpretation
Learners' Mathematics Performance	First Quarter	80.03	Satisfactory
	Second Quarter	80.13	Satisfactory

As presented in Table 2, learners obtained an overall mean grade of 80.03 in the first quarter, which is interpreted as satisfactory. In the second quarter, the learners obtained an overall grade of 80.13, which was interpreted as satisfactory. This result implies that learners exhibit average performance in mathematics, neither good nor bad. The result indicates that there is room for improvement in their mathematical skills. Educators may need to focus on targeted strategies to enhance understanding and boost performance. The result is supported by Romano (2021), who found that the learners' mathematics performance level was only satisfactory.

Table 3
Difference in the Level of Problem-Solving Skills of the Learners according to Fundamental Operations when grouped and compared according to Sex, Parents' Highest Educational Attainment, and Average Family Monthly Income

Variable	Category	N	Mean	*t*-value	*p*-value	*Sig. level*	Interpretation
Sex	Male	34	6.56	-2.792	0.007		Significant
	Female	26	8.35				
Parents' Highest Educational Attainment	Lower	27	6.56	-2.139	0.037	0.05	Significant
	Higher	33	7.80				
Average Family Monthly Income	Lower	15	7.27	-0.124	0.902		Not Significant
	Higher	45	7.36				

Table 3 presents the inferential statistics on the difference in the level of problem-solving skills of learners in fundamental operations when grouped and compared according to variables.

The computed p-value for the variable average family monthly income is 0.902, greater than the 0.05 significance level and thus interpreted as insignificant. Therefore, the hypothesis stating there is no significant difference in the level of problem-solving skills of learners in fundamental operations when grouped and compared according to average family monthly income was accepted.

However, for variable sex and parents' highest educational attainment, the computed p-values are 0.007 and 0.037, respectively, all less than the 0.05 significance level and thus interpreted as significant. Therefore, the hypothesis stating there is no significant difference in the level of problem-solving skills of learners in fundamental operations when grouped and compared according to sex and parents' highest educational attainment was rejected.

The finding implies that the learners' problem-solving skills vary when compared by their sex and their parents' highest educational attainment. The study suggests that sex and parents' educational attainment influence the learners' profound foundation in problem-solving skills in four fundamental operations. This is because the female learners were more academically goal-oriented than the males. A learner with highly educated parents may receive better instructional supervision from parents, resulting in easier completion of problem-solving assignments. The result is supported by Rosidi and Hadi (2019), who found a significant difference in students' problem-solving skills between males and females. Amalina and Vidákovich (2023) showed a significant difference in students' problem-solving skills according to the socio-economic status of the learners.

Table 4
Difference in the Level of Problem-Solving Skills of the Learners according to Ratio and Proportion when grouped and compared according to Sex, Parents' Highest Educational Attainment, and Average Family Monthly Income

Variable	Category	N	Mean	*t*-value	*p*-value	*Sig. level*	Interpretation
Sex	Male	34	4.79	-3.801	0.000	0.05	Significant

	Female	26	7.27			
Parents' Highest Educational Attainment	Lower	27	5.63	-0.588	0.599	Not Significant
	Higher	33	6.06			
Average Family Monthly Income	Lower	15	5.27	-1.159	0.254	Not Significant
	Higher	45	6.07			

Table 4 depicts the inferential statistics on the difference in learners' problem-solving skills in ratios and proportions when grouped and compared according to variables.

The computed p-values for variables parents' highest educational attainment and average family monthly income are 0.599 and 0.254, respectively, greater than the 0.05 significance level and thus interpreted as insignificant. Therefore, the hypothesis stating there is no significant difference in the level of problem-solving skills of learners in ratios and proportions when grouped and compared according to parents' highest educational attainment and average family monthly income was accepted.

However, for variable sex, the computed p-value is 0.000, which is less than the 0.05 significance level and thus interpreted as significant. Therefore, the hypothesis stating there is no significant difference in the level of problem-solving skills of learners in ratio and proportion when grouped and compared according to sex was rejected.

The finding indicates variation in the learners' problem-solving skills in ratio and proportion when grouped and compared according to sex. Female learners are observed to have better problem-solving skills in ratio and proportion compared to their male counterparts. This result is inconsistent with the findings of Kasturi et al. (2021) and Subekti and Krisdiani (2021), who reported significant differences between male and female students' mathematical problem-solving attitudes.

Table 5
Difference in the Level of Problem-Solving Skills of the Learners according to Percentage, Rate, and Simple Percentage when grouped and compared according to Sex, Parents' Highest Educational Attainment, and Average Family Monthly Income

Variable	Category	N	Mean	*t*-value	*p*-value	*Sig. level*	Interpretation
Sex	Male	34	1.06	-3.712	0.000		Significant
	Female	26	3.27				
Parents' Highest Educational Attainment	Lower	27	1.37	-1.832	0.072	0.05	Not Significant
	Higher	33	2.55				
Average Family Monthly Income	Lower	15	2.40	0.677	0.501		Not Significant
	Higher	45	1.89				

Table 5 discloses the inferential statistics on the difference in learners' problem-solving skills level in percentage, rate, and simple interest when grouped and compared according to variables.

The computed p-values for the variable's parents' highest educational attainment and average family monthly income are 0.072 and 0.501, respectively, all greater than the 0.05 significance level and thus interpreted as insignificant. Therefore, the hypothesis stating there is no significant difference in the level of problem-solving skills of learners in the area of percentage, rate, and simple interest when grouped and compared according to parents' highest educational attainment and average family monthly income was accepted.

However, for variable sex, the computed p-value is 0.000, which is less than the 0.05 significance level and thus interpreted as significant. Therefore, the hypothesis stating there is no significant difference in the level of problem-solving skills of learners in percentage, rate, and simple interest when grouped and compared according to sex was rejected.

The result implies that the learners' problem-solving skills differ according to sex and average family monthly income. This is because female learners from higher-income families have more complex thoughts than male learners. They

tend to be more interested in finding the best solution before judging a particular problem. This evidence suggests that female learners from higher-income families may engage in deeper analysis, enhancing problem-solving skills. This result is consistent with the findings of Humairah (2021), whose study found superior problem-solving abilities among girls compared to boys. Ayala, Strasser, Susperreguy, and Castillo (2024) found a significant gap in student problem-solving skills depending on the student's socio-economic status.

Table 6
Difference in the Level of Learners' Mathematics Performance when grouped and compared according to Sex, Parents' Highest Educational Attainment, and Average Family Monthly Income

Variable	Category	N	Mean	*t*-value	*p*-value	*Sig. level*	Interpretation
Sex	Male	34	79.09	-2.850	0.006		Significant
	Female	26	81.38				
Parents' Highest Educational Attainment	Lower	27	79.70	-0.829	0.411	0.05	Not Significant
	Higher	33	80.39				
Average Family Monthly Income	Lower	15	79.47	-0.778	0.455		Not Significant
	Higher	45	80.29				

Table 6 summarizes the comparative statistics on the learners' academic performance level when grouped and compared according to sex, parents' highest educational attainment, and average family monthly income.

For the variables parents' highest educational attainment and average family monthly income, the computed p-values are 0.411 and 0.455, respectively, greater than the 0.05 significance level. Based on the results, it was interpreted as not significant. Therefore, the hypothesis stating no significant difference in the academic performance was accepted when grouped and compared according to parents' highest educational attainment and average family monthly income.

However, for variable sex, the computed p-value is 0.006, less than the 0.05 significance level; thus, they are interpreted as significant. Therefore, the hypothesis stating no significant difference in the academic performance was accepted when grouped and compared according to parents' highest educational attainment and average family monthly income.

However, for variable sex, the computed p-value is 0.006, less than the 0.05 significance level; thus, they are interpreted as significant. Therefore, the hypothesis stating no significant difference in the level of academic performance when grouped and compared according to sex was rejected.

The result implies that learners' gender can influence their performance in school. Goal-oriented female learners usually possess positive feelings regarding their school experiences; they have the traits of discipline, diligence, and resourcefulness; and they tend to devote less time to recreation and leisure activities. Gumasing (2021) supports the result, revealing that female students perceive higher academic effort than male students.

Table 7
Relationship Between the Level of Problem-Solving Skills and their Level of Mathematics Performance

Variables	N	*r*	p-value	Level of Significance	Interpretation
Level of Problem-Solving Skills	60	.660	.000	0.05	Significant
Level of Mathematics Performance	60				

As presented in the table, the computed r was 0.600 with a p-value of 0.000, less than the 0.05 significance level; thus, it is interpreted as significant. Therefore, the hypothesis stating that no significant relationship exists between the level of learners' problem-solving skills and academic performance was rejected.

The finding implies that problem-solving skills positively influence the learners' academic performance. When the learners perform better in problem-solving skills and target a high score on the test, they achieve better and more desirable academic performance. The result is supported by Sinaga et al. (2023), revealing that the students' problem-solving understanding significantly influences mathematics learning results.

Conclusions:

The study found that most respondents came from families with educated parents and higher incomes. Learners demonstrated high problem-solving skills in fundamental operations, moderate in ratio and proportion, but low in percentage, rate, and simple interest, while their overall mathematics performance was satisfactory. Female learners generally outperformed males, particularly those with parents of higher educational attainment and income. Significant differences were observed in problem-solving skills and mathematics performance when grouped by sex and parents' education, with a strong positive relationship between problem-solving ability and mathematics performance. The study concluded that learners excel in basic operations but struggle with more complex concepts due to limited conceptual understanding and analytical skills, with gender and parental background influencing outcomes. It is recommended that teachers implement targeted activities—such as "What's Great with Numbers?" for basic operations, "Part of You is Me" for ratio and proportion, and "What's Your Business?" for percentage, rate, and simple interest—to enhance mathematical comprehension. Regular monitoring, parental involvement, use of technology-assisted instruction, and professional development for teachers are also encouraged to strengthen learners' problem-solving and mathematics performance.

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