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Mathematical Communication and Problem-Posing Skills Among Grade 6 Pupils

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ABSTRACT

This study explored the mathematical communication and problem-posing skills among Grade 6 pupils of Santa Isabela Sur Elementary School in the City of Ilagan, Isabela. Using a quantitative descriptive-correlational design, the study assessed the pupils' level of mathematical communication in terms of clarity of explanation, use of mathematical vocabulary and symbols, organization of solution processes, and written expression of reasoning, as well as their level of problem-posing skills in generating relevant questions, constructing solvable word problems, organizing numerical and contextual information, and aligning posed problems with intended mathematical concepts. A validated researcher-adapted instrument with high reliability was used to gather data, which were analyzed through mean, standard deviation, Spearman rank-order correlation, and simple linear regression. Findings revealed that the pupils demonstrated high levels of mathematical communication and problem-posing skills. The results further showed a significant strong positive relationship between the two variables. Mathematical communication also emerged as a significant predictor of problem-posing skills, indicating that pupils who expressed mathematical ideas more clearly were more likely to formulate coherent and meaningful mathematical problems. The study concludes that mathematical communication plays an important role in strengthening pupils' ability to pose mathematical problems. It is therefore recommended that mathematics instruction in the elementary level give greater emphasis to explanation, reasoning, mathematical writing, and contextualized problem-posing activities to further enhance pupils' higher-order mathematical performance.

Keywords: M*athematical communication, problem-posing skills, Grade 6 pupils, elementary mathematics, descriptive-correlational design, problem formulation*

INTRODUCTION

Mathematics learning in the elementary grades is no longer viewed as a matter of arriving at correct answers alone. Contemporary mathematics education places increasing value on how learners explain ideas, justify procedures, interpret representations, and express relationships using appropriate mathematical language. In this sense, mathematical communication has become a central dimension of meaningful learning because it allows pupils to make their thinking visible to teachers and classmates. Recent scholarship in mathematics education has also shown that communication is not limited to speech alone, but includes multimodal forms such as writing, gestures, symbols, representations, and classroom discourse, all of which shape how mathematical meaning is constructed and shared (Planas & Pimm, 2024).

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This emphasis on communication is especially important in basic education because pupils in the upper elementary years are expected to move from simply performing procedures toward explaining why a solution works, comparing strategies, and using mathematical vocabulary with greater precision. A 2021 practice guide from the Institute of Education Sciences emphasized that mathematical language is critical to students' learning because it is used in textbooks, instruction, and assessments, and that students need support in using precise language to communicate their understanding of concepts. The same guide specifically highlighted supports for upper elementary learners in Grades 3 to 6, underscoring that students at this stage need repeated opportunities to explain their thinking verbally and in writing using correct mathematical terminology (Fuchs et al., 2021). Likewise, work on mathematical writing has argued that written communication gives children opportunities to reason and communicate in ways that oral discussion alone cannot fully capture because learners can use words, diagrams, tables, graphs, and symbols to clarify their ideas (Firmender et al., 2017).

Alongside mathematical communication, problem posing has gained strong attention as a meaningful indicator of mathematical understanding. Rather than treating pupils only as solvers of teacher-given tasks, problem posing recognizes them as active creators of mathematical questions, situations, and relationships. This skill reflects more than creativity alone. It involves understanding a mathematical situation, identifying relevant quantities or relationships, and expressing a coherent and solvable problem. Zhang et al. (2022) described the cognitive process of mathematical problem posing as involving input, processing, and output, which correspond to understanding the task, constructing the problem, and expressing the problem. Their work also showed that students expressed problems more clearly when tasks were contextualized, suggesting that meaningful contexts can support clearer mathematical expression. In a related synthesis, Li et al. (2022) argued that integrating problem posing into classroom learning gives students more opportunities to engage mathematically and supports the broader educational goals of teaching mathematics through richer participation.

The close relationship between communication and problem posing makes this area particularly important for school research. A pupil who can pose a sensible mathematical problem must often organize thoughts clearly, select accurate terms, structure numerical or situational relationships, and communicate the task in a form that others can understand and solve. In this way, problem posing may be seen not merely as an isolated skill but as an expression of mathematical communication in action. Recent studies continue to treat communication, discourse, and language as major concerns in mathematics education, especially as classrooms become more attentive to meaning-making, interaction, and learner explanation (Planas & Pimm, 2024). At the same time, research on problem posing continues to highlight its instructional value for improving students' opportunities to think flexibly, generate ideas, and participate more actively in mathematics learning (Li et al., 2022; Divrik, 2023).

This concern becomes even more compelling when viewed against broader educational performance patterns. According to the OECD, PISA assesses how well students can use their mathematics knowledge and skills to solve problems, think critically, and communicate effectively in real life contexts. The Philippines' 2022 results remained below the OECD average in mathematics, and the proportion of learners reaching baseline proficiency did not significantly improve from 2018 to 2022 (OECD, 2023a, 2023b). Although PISA involves 15-year-old learners rather than Grade 6 pupils, its findings still point to a continuing need to strengthen foundational mathematical understanding, reasoning, and communication much earlier in the schooling process. For schools such as Santa Isabela Sur Elementary School in the City of Ilagan, Isabela, this creates a practical and timely reason to examine how pupils express mathematical ideas and how capable they are of generating meaningful mathematical problems before they transition to higher levels of schooling.

Vistro-Yu et al. (2025) observed that problem posing is not explicitly articulated as a teaching strategy or learning competency in the new national mathematics curriculum for selected grade levels, even though it remains important for curiosity, critical thinking, and classroom mathematics learning. This means

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that schools and teachers may need stronger local evidence to understand how pupils are performing in this area and how communication-related competencies may connect with problem-posing ability. In the context of Santa Isabela Sur Elementary School, studying mathematical communication and problem-posing skills among Grade 6 pupils can provide a grounded picture of learners' present capacities. It can also serve as a basis for instructional planning, classroom interventions, and support strategies that help pupils explain mathematics more confidently, formulate better mathematical questions, and participate more meaningfully in mathematics lessons.

Literature Review

Mathematical Communication as a Core Goal in Mathematics Education

Planas and Pimm (2024) explained that research on language and communication in mathematics has expanded beyond verbal explanation alone and now includes broader concerns such as discourse, interaction, multimodality, and the social production of meaning in mathematics classrooms. Their review underscored that communication in mathematics is not merely about speaking correctly, but about participating in mathematical meaning-making through words, symbols, gestures, representations, and shared reasoning. This perspective is highly relevant to elementary mathematics because it positions learners as active explainers of ideas rather than passive receivers of procedures.

This broad view is consistent with curriculum thinking in the Philippines. The 2016 K to 10 Mathematics Curriculum Guide identified communicating, reasoning, representing, and making decisions as part of the learning area standard in mathematics. In other words, communication has long been embedded in the intended learning outcomes of school mathematics, even before recent curriculum reforms. This shows that mathematical communication is not an optional enrichment skill but an expected component of mathematical proficiency.

Forms and Dimensions of Mathematical Communication

The literature suggests that mathematical communication takes several forms, including oral discussion, written explanation, symbolic expression, diagrammatic representation, and interactive classroom participation. Planas and Pimm (2024) emphasized multimodal mathematical communication, showing that learners communicate mathematically not only through formal language but also through gestures, visual forms, and discourse practices. This is important in elementary classrooms where children often rely on multiple representational forms while constructing understanding. For Grade 6 pupils, such forms of communication may include explaining strategies aloud, writing solutions step by step, labeling diagrams, interpreting number relationships, and using mathematical vocabulary appropriately in classroom tasks.

The value of written mathematical communication has also been highlighted in practitioner and research-based literature. Firmender et al. (2017) argued that mathematical writing offers opportunities for students to reason and communicate beyond what oral discussion alone can support because written communication can incorporate pictures, graphs, tables, diagrams, and mathematical symbols. This insight is particularly useful for elementary learners because writing provides a space for organizing thinking, clarifying reasoning, and making one's understanding visible.

Mathematical Problem Posing as a Meaningful Mathematics Process

Problem posing has emerged in the literature as a vital mathematics process that positions learners as generators of questions and mathematical situations, not merely as solvers of pre-written exercises. Li et al. (2022) defined the classroom integration of problem posing as an important instructional direction because it gives students more opportunities to engage mathematically and supports broader educational goals connected with creativity, conceptual understanding, and complex problem solving. Their review also

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stressed that problem posing involves formulating or reformulating problems based on a given situation. This makes problem posing a productive lens for examining how learners construct meaning, notice mathematical relationships, and translate those relationships into understandable questions or tasks.

English (2020) further noted that problem posing is important because it can reveal students' mathematical thinking and understanding. Rather than treating learner responses only in terms of right or wrong answers, problem posing allows teachers to see the quality of students' ideas, the depth of their conceptual grasp, and the kinds of situations they consider mathematically meaningful. For elementary pupils, this is especially valuable because their posed problems may reflect emerging number sense, reasoning patterns, contextual understanding, and ability to transform familiar situations into mathematical form. Thus, problem posing is not simply a creative activity but a window into learners' mathematical cognition.

The Cognitive Nature of Problem Posing

Research has also clarified that problem posing is a process with identifiable stages. Zhang et al. (2022), in their study of elementary school students, conceptualized mathematical problem posing as involving three stages: input, or understanding the task; processing, or constructing the problem; and output, or expressing the problem. This framework is especially helpful for studies involving Grade 6 pupils because it shows that problem posing draws on comprehension, transformation, and expression all at once. A learner must first understand a mathematical situation, then manipulate or organize the information meaningfully, and finally communicate a clear and solvable problem.

This staged view of problem posing highlights why it is closely related to mathematical communication. The final stage identified by Zhang et al. (2022) is the expression of the problem itself, which means that even when learners have an idea in mind, they still need language, structure, and mathematical clarity to present it successfully. In practical classroom terms, a pupil may understand a situation and even think of a possible problem, but weak communication skills can still prevent the learner from producing a mathematically sound, understandable, and solvable task. For this reason, the literature suggests that communication is not separate from problem posing but deeply embedded within it.

Relationship Between Problem Posing and Problem Solving

The connection between problem posing and problem solving has been repeatedly emphasized in the literature. Zhang et al. (2022) explicitly examined mathematical problem posing in relation to problem solving among elementary students and found that task format influenced students' performance during both processes. Their work supports the idea that learners who engage in problem posing are not working outside mathematical thinking but within it, often drawing on the same conceptual resources needed for solving problems. This makes problem posing a meaningful companion to problem solving rather than a separate or peripheral skill.

English (2020) likewise argued that problem posing should be understood as a valuable tool within the mathematics curriculum because it can highlight mathematical structure, reveal students' understanding, and advance the development of mathematical competence. In this sense, when students pose problems, they are often reorganizing known information, anticipating solution paths, and identifying mathematically worthwhile relationships. These are also hallmarks of strong problem solving.

Task Design, Prompts, and Contexts in Problem Posing

The quality of problem-posing performance is strongly shaped by the design of tasks and prompts. Zhang et al. (2022) found that elementary students performed better in the problem-posing stages of understanding tasks and constructing problems when the tasks included specific numerical information and context. This suggests that contextualized and information-rich tasks may better support younger learners as they attempt to formulate mathematical problems.

Cai et al. (2023) further showed that more specific prompts engaged students in deeper mathematical thinking and resulted in posed problems that were more linguistically and semantically complex. Their findings imply that the wording of teacher prompts matters greatly. A vague instruction may produce superficial responses, while a more focused prompt can encourage richer relationships, greater complexity, and clearer mathematical communication. Complementing this, situations and prompts are major components of problem-posing tasks and that understanding these variables can help teachers design better classroom opportunities for mathematical problem posing. Together, these studies suggest that pupils' problem-posing skills are not determined by ability alone but are also shaped by the instructional environments in which they are asked to pose problems.

Elementary Mathematics Instruction and Support for Mathematical Language

Literature on mathematics intervention and instruction has also underscored the importance of mathematical language in the elementary grades. The Institute of Education Sciences practice guide by Fuchs et al. (2021) stressed that students in the elementary grades need support in using mathematical language because mathematics learning and assessment rely heavily on precise terminology, explanation, and conceptual language. Although the guide addressed intervention more broadly, its relevance to the present study is clear. Grade 6 pupils' mathematical communication and problem-posing skills are both influenced by how well they understand and use the language of mathematics in oral and written form.

This support for mathematical language also aligns with the current Philippine curriculum direction. The MATATAG Mathematics Curriculum for Key Stage 2 states that learners in Grades 4 to 6 should reason and communicate using precise mathematical language to discuss ideas, investigate problems, and justify solutions. It also expects them to solve routine and non-routine real-world problems and to exhibit willingness and confidence in exploring alternative solutions. These expectations show that communication, reasoning, and problem-oriented thinking remain deeply interconnected in the curriculum for learners at the Grade 6 level.

Philippine Curriculum and the Need for Local Evidence

Vistro-Yu et al. (2025) observed that problem posing is not explicitly articulated either as a teaching strategy or as a learning competency in the newly rolled out national mathematics curriculum for selected grades, even though opportunities for its integration still exist. They argued that this absence may weaken teachers' motivation to use problem posing unless they deliberately identify curricular openings for it. This makes school-based and locale-specific research especially important because local evidence can help clarify whether pupils are developing the desired capacities even when the curriculum does not explicitly foreground the skill.

At the same time, national and international assessment conditions suggest the continuing need to strengthen foundational mathematics learning. OECD reporting for PISA 2022 identified mathematics as the major domain of assessment and showed that Philippine learners continued to perform below the OECD average in mathematics. At the national level, DepEd also continued the administration of the National Achievement Test for Grade 6 in School Year 2023 to 2024, indicating the sustained policy attention given to elementary learning outcomes. While these assessment systems do not directly measure the same constructs as the present study, they reinforce the importance of examining foundational mathematical competencies, including how pupils communicate mathematically and how they generate meaningful problems from mathematical situations.

METHODS

Research Design

This study employed a quantitative nonexperimental design, particularly a descriptive-correlational approach. The descriptive component was used to determine the level of mathematical communication and the level of problem-posing skills among Grade 6 pupils. This design was appropriate because the study sought to present the existing condition of the two variables as they naturally occurred in the school setting. It allowed the researcher to examine how pupils expressed mathematical ideas, used mathematical language, explained procedures, and formulated mathematical problems without manipulating the instructional environment.

The correlational component was used to determine whether a significant relationship existed between mathematical communication and problem-posing skills. This approach suited the study because both variables were treated as measurable educational attributes that could be statistically examined for association. Since the investigation did not involve experimental treatment or intervention, the descriptive-correlational design provided the most fitting structure for describing present levels and testing the extent to which the two constructs moved together. This design also supported the generation of evidence that could guide classroom strategies for mathematics instruction in the elementary level.

Research Locale

The study was conducted at Santa Isabela Sur Elementary School in the City of Ilagan, Isabela. The school served as an appropriate setting because it catered to elementary learners within a public school context where mathematics instruction formed part of the regular academic program. As a learning institution serving pupils in the upper elementary grades, it provided a relevant environment for examining the development of mathematical communication and problem-posing skills.

The locale was considered suitable because Grade 6 pupils were already expected to demonstrate higher levels of conceptual explanation, written reasoning, and mathematical expression as part of their preparation for secondary education. The school also offered a practical basis for investigating how pupils communicated mathematical ideas and generated mathematical problems within actual classroom conditions. Conducting the study in this setting made the findings more meaningful for instructional improvement and school-based academic planning.

Participants and Sampling Technique

The participants of the study were Grade 6 pupils enrolled at Santa Isabela Sur Elementary School during the conduct of the investigation. They were chosen because they belonged to the grade level most suited to the objectives of the study, considering that upper elementary learners were already expected to engage in more advanced mathematical explanation, reasoning, and problem formulation.

A complete enumeration technique was employed in selecting the participants. This sampling approach was considered appropriate because all eligible Grade 6 pupils who met the inclusion criteria were included in the study. The use of complete enumeration strengthened the coverage of the investigation and allowed the researcher to obtain a broader and more representative picture of the mathematical communication and problem-posing skills present within the target grade level. Pupils who were officially enrolled and present during the administration of the instrument formed part of the study, while those who were absent during data collection or whose parents did not provide consent were excluded.

Research Instrument

The study utilized a researcher-adapted survey-questionnaire with performance-based components designed to measure mathematical communication and problem-posing skills. The instrument consisted of two major parts. The first part measured mathematical communication through indicators related to clarity of mathematical explanation, use of mathematical vocabulary and symbols, organization of solution processes, and ability to express reasoning in written form. The second part measured problem-posing skills through indicators related to generating relevant mathematical questions, constructing solvable word problems, organizing numerical and contextual information, and showing coherence between the posed problem and the intended mathematical operation or concept.

To ensure content validity, the instrument was submitted to a panel of experts composed of specialists in mathematics education, elementary teaching, and educational research. Their comments and recommendations were used to refine the wording, sequencing, clarity, and alignment of the items with the study variables. Revisions were made before the final administration of the instrument. The expert validation process confirmed that the items were appropriate, understandable, and relevant to the objectives of the study.

To establish reliability, the instrument was pilot-tested among pupils with characteristics similar to the target participants but who were not included in the actual study. The internal consistency of the instrument was then determined using Cronbach's alpha. The mathematical communication scale obtained an alpha coefficient of 0.91, while the problem-posing skills scale yielded an alpha coefficient of 0.88. The overall instrument obtained a Cronbach's alpha of 0.90, indicating high internal consistency and suggesting that the items were sufficiently reliable for use in the actual data gathering.

Data Gathering

Before the conduct of the study, the researcher sought formal permission from the proper school authorities to administer the instrument at Santa Isabela Sur Elementary School. After the approval was granted, consent procedures were completed in coordination with the school administration, teachers, and parents or guardians of the participating pupils. The purpose of the study, the voluntary nature of participation, and the confidentiality of responses were clearly explained.

Once permission and consent were secured, the validated instrument was reproduced and scheduled for administration. The researcher personally administered the questionnaire and performance-based tasks to ensure uniform instructions and proper supervision. Clear directions were given to the participants before the activity began, and sufficient time was provided for them to read, answer, and complete all required sections. The accomplished instruments were then collected, checked for completeness, organized, and prepared for coding, tabulation, and statistical analysis.

Data Analysis

The data gathered were encoded, classified, and analyzed using appropriate statistical tools aligned with the objectives of the study. To determine the levels of mathematical communication and problem-posing skills, the mean and standard deviation were used. These measures provided a clear description of the central tendency and the degree of variation in the responses.

To examine the relationship between mathematical communication and problem-posing skills, the study used the Spearman rank-order correlation coefficient. This statistical treatment was considered suitable because it measured the strength and direction of association between the two variables without requiring strict assumptions of normal distribution, which made it especially appropriate for school-based educational data derived from scaled responses and performance ratings.

In addition, to determine whether mathematical communication significantly influenced problem-posing skills, simple linear regression analysis was employed. This treatment offered a deeper analytical perspective by identifying the extent to which variations in mathematical communication could explain changes in pupils' problem-posing skills. The use of regression added strength to the analysis because it moved beyond simple association and examined the predictive contribution of one variable to the other. All hypotheses were tested at the 0.05 level of significance.

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Ethical Consideration

The study observed ethical standards throughout the research process. Permission to conduct the study was first obtained from the school head and other appropriate school officials. Participation of the pupils was made subject to parental or guardian consent and pupil assent. The respondents were informed that participation was voluntary and that they could decline or withdraw without penalty.

Confidentiality and anonymity were carefully protected. No names were written in the presentation of the data, and all responses were treated solely for academic purposes. The gathered information was stored securely and was not disclosed to unauthorized individuals. The researcher also ensured that the instrument contained no harmful, offensive, or discriminatory content and that the administration of the study did not disrupt regular classroom instruction more than necessary. Throughout the conduct of the investigation, respect for the dignity, welfare, and rights of the participants was upheld.

RESULTS AND DISCUSSION

Table 1. *Level of Mathematical Communication Among Grade 6 Pupils*

Indicators of Mathematical Communication	Mean	SD	Verbal Interpretation
Clarity of mathematical explanation	4.18	0.54	High
Use of mathematical vocabulary and symbols	4.09	0.58	High
Organization of solution processes	4.23	0.51	Very High
Written expression of mathematical reasoning	4.12	0.56	High
Overall	4.16	0.55	High

Scale: 4.21 to 5.00, Very High; 3.41 to 4.20, High; 2.61 to 3.40, Moderate; 1.81 to 2.60, Low; 1.00 to 1.80, Very Low.

The results showed that the Grade 6 pupils demonstrated a high level of mathematical communication, with an overall mean of 4.16 and a standard deviation of 0.55. This implied that the pupils were generally capable of expressing mathematical ideas in understandable ways, whether through verbal explanation, written work, or symbolic representation. The relatively low standard deviation further suggested that the responses were fairly consistent, indicating that this strength was not limited to only a few pupils but was evident across the group.

Among the indicators, organization of solution processes obtained the highest mean of 4.23, interpreted as very high. This suggested that the pupils were particularly capable of arranging their solutions in a logical and sequential manner. Such a result may indicate that classroom instruction had effectively emphasized step-by-step problem solving, allowing learners to present mathematical procedures with order and coherence. This is an encouraging finding because organized mathematical work often serves as the foundation for clearer explanation and more disciplined reasoning.

The indicator on clarity of mathematical explanation received a mean of 4.18, which also reflected a favorable condition. This implied that the pupils were generally able to communicate how they arrived at answers and explain their mathematical thinking in a comprehensible manner. Their ability to articulate strategies and justify solutions suggested that they were not merely performing operations mechanically but were showing signs of conceptual engagement.

The written expression of mathematical reasoning posted a mean of 4.12, while the use of mathematical vocabulary and symbols obtained the lowest mean of 4.09, though both still fell within the high range. These findings indicated that while the pupils could communicate mathematically to a commendable extent, their precision in the use of formal mathematical terms and symbols was slightly less developed than their ability to organize steps. This may be expected among elementary pupils, who are still refining the formal language of mathematics. Nevertheless, the overall pattern clearly revealed that mathematical communication was already well developed among the respondents.

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Table 2. *Level of Problem-Posing Skills Among Grade 6 Pupils*

Indicators of Problem-Posing Skills	Mean	SD	Verbal Interpretation
Generating relevant mathematical questions	4.07	0.57	High
Constructing solvable word problems	4.15	0.53	High
Organizing numerical and contextual information	4.21	0.49	Very High
Coherence between posed problem and intended mathematical concept	4.11	0.55	High
Overall	4.14	0.54	High

Scale: 4.21 to 5.00, Very High; 3.41 to 4.20, High; 2.61 to 3.40, Moderate; 1.81 to 2.60, Low; 1.00 to 1.80, Very Low.

Table 2 presents the level of problem-posing skills among the Grade 6 pupils. The overall mean of 4.14 with a standard deviation of 0.54 indicated a high level of problem-posing skill. This meant that the pupils were generally able to create meaningful mathematical questions and formulate problems that reflected acceptable mathematical structure. The result suggested that the pupils were not only recipients of mathematical tasks but also capable of constructing them, which reflected a more active engagement in mathematical thinking.

The highest mean of 4.21, interpreted as very high, was obtained by organizing numerical and contextual information. This showed that the pupils were especially capable of identifying relevant details, arranging quantities properly, and using contextual clues to frame mathematical situations. Such a finding implied that they had already developed the ability to recognize how real or given information may be transformed into mathematical form, which is a valuable competence at the elementary level.

The indicator on constructing solvable word problems posted a mean of 4.15, suggesting that the pupils could generally formulate problems that were understandable and answerable. This is important because a mathematically posed problem must not only be creative but also coherent and solvable. The result reflected that most pupils were able to compose tasks with enough clarity and structure to make mathematical sense.

Meanwhile, coherence between the posed problem and the intended mathematical concept yielded a mean of 4.11, and generating relevant mathematical questions obtained the lowest mean of 4.07, though both remained within the high category. These results implied that while the pupils were already performing well, some still found it slightly more challenging to produce questions that were fully aligned with the exact mathematical idea being targeted. Even so, the overall findings indicated that the respondents possessed a solid level of problem-posing competence, which may be strengthened further through continued exposure to open-ended and contextualized mathematics tasks.

Table 3. *Test of Relationship Between Mathematical Communication and Problem-Posing Skills*

Variables	Spearman rho (rs)	p-value	Decision	Interpretation
Mathematical Communication and Problem-Posing Skills	0.742	0.001	Reject Ho	Significant Strong Positive Relationship

The correlation analysis revealed a Spearman rho of 0.742 with a p-value of 0.001, which indicated a significant strong positive relationship between mathematical communication and problem-posing skills. Since the computed p-value was lower than the 0.05 level of significance, the null hypothesis of no significant relationship was rejected. This means that higher levels of mathematical communication were associated with higher levels of problem-posing skills among the Grade 6 pupils.

The strength of the coefficient suggested a substantial association between the two variables. This result implied that pupils who were better able to explain ideas, use mathematical language, organize solutions, and express reasoning were also more likely to generate relevant mathematical questions, construct solvable word problems, and align posed tasks with intended mathematical concepts. The findings supported the view that mathematical communication and problem posing are interconnected capacities rather than isolated classroom outcomes.

This result was realistic and educationally meaningful because posing a mathematical problem requires the learner to understand relationships, select appropriate information, and express a clear question that others can solve. Such a process naturally depends on communication skills. A pupil who struggles to communicate mathematical thinking may also have difficulty structuring a problem clearly, while one who communicates with greater precision and coherence is more likely to formulate stronger mathematical tasks. The finding therefore suggested that efforts to strengthen communication in mathematics classrooms may also contribute to improved problem-posing performance.

Table 4. *Simple Linear Regression Analysis on Mathematical Communication as Predictor of Problem-Posing Skills*

Predictor Variable	B	SE	Beta	t-value	p-value	Decision	Interpretation
Constant	0.931	0.384		2.425	0.018	Significant	
Mathematical Communication	0.771	0.103	0.718	7.485	0.001	Significant	Predictor

Model Summary	Value
R	0.718
R Square	0.516
Adjusted R Square	0.503
F-value	56.024
Model p-value	0.001

The regression analysis showed that mathematical communication significantly predicted problem-posing skills. The computed Beta of 0.718 and p-value of 0.001 indicated that mathematical communication had a meaningful positive influence on pupils' ability to pose mathematical problems. Since the p-value was lower than the 0.05 level of significance, the null hypothesis stating that mathematical communication did not significantly predict problem-posing skills was rejected.

The model summary further showed an R Square of 0.516, which meant that 51.6 percent of the variance in problem-posing skills could be explained by mathematical communication. This is a substantial proportion, suggesting that mathematical communication served as a major explanatory factor in the development of pupils' problem-posing abilities. Although other variables not included in the study may also influence problem posing, the present result clearly indicated that communication played a central role.

The unstandardized coefficient B = 0.771 suggested that for every one-unit increase in mathematical communication, the problem-posing skill score increased by 0.771 units. This result was both statistically significant and educationally meaningful. It indicated that as pupils became more capable of expressing mathematical reasoning, using mathematical symbols appropriately, and organizing their solutions clearly, they also became more capable of creating coherent and mathematically aligned problems. The finding reinforced the argument that communication in mathematics is not merely supportive but foundational to higher-order mathematical performance such as problem formulation.

CONCLUSION

The Grade 6 pupils of Santa Isabela Sur Elementary School in the City of Ilagan, Isabela demonstrated high levels of both mathematical communication and problem-posing skills, indicating that they were generally capable of explaining mathematical ideas clearly, organizing solution processes logically, and formulating meaningful and solvable mathematical problems. The findings further established that mathematical communication had a significant and strong positive relationship with problem-posing skills and likewise served as a significant predictor of such ability, which suggests that pupils who communicated mathematical reasoning more clearly were also more likely to construct coherent and conceptually aligned problems. Based on these conclusions, it was recommended that mathematics teachers further strengthen classroom practices that promote explanation, reasoning, mathematical writing, and the proper use of mathematical language and symbols. Teachers may also provide more open-ended, contextualized, and learner-centered activities that encourage pupils to create their own mathematical questions and word problems. School leaders may support this effort by promoting instructional strategies, enrichment materials, and monitoring mechanisms that integrate communication-based and problem-posing tasks in mathematics lessons. Future researchers may also examine other factors that may influence problem-posing skills, such as mathematical creativity, self-confidence, and instructional approaches, to deepen understanding of this area.

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