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	GIF (Australia) = 0.564	ESJI (KZ) = 8.100	IBI (India) = 4.260
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Issue Article

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UNDERSTANDING STUDENTS' NUMERACY COMPETENCE THROUGH THE LENS OF CONFIDENCE IN PROBLEM SOLVING AND ATTITUDE TOWARDS MATHEMATICS

Abstract: *This study assessed the relationship between attitudes towards mathematics, problem-solving confidence, and numeracy skills of Grade 9 students. A total of 100 respondents were surveyed using standardized questionnaires and numeracy assessments. The study examined demographic profiles, parental educational attainment, and household income as contextual variables. Results revealed that the majority of respondents come from families with college-level education and middle-income households. In terms of attitudes towards mathematics, students exhibited a neutral overall disposition, with high recognition of the value of mathematics, moderate self-confidence, enjoyment, and motivation. Problem-solving confidence was generally moderate, with students showing persistence in challenging tasks but experiencing occasional stress and fear of errors. Numeracy skills varied, with most students classified at the basic level, indicating foundational competence but limited proficiency in complex mathematical operations. Spearman's rho correlation analyses indicated a negligible positive relationship between attitudes towards mathematics and numeracy skills, which was not statistically significant. In contrast, problem-solving confidence showed a statistically significant, albeit weak, positive correlation with numeracy performance. These findings suggest that fostering problem-solving confidence may have a greater impact on enhancing students' numeracy skills than attitudes alone. The study highlights the importance of supportive instructional strategies, scaffolded problem-solving activities, and differentiated learning to strengthen numeracy competence and confidence. Interventions aimed at improving both cognitive skills and affective dispositions toward mathematics are recommended to promote overall mathematical competence and engagement.*

Key words: *Teaching Mathematics, attitudes towards mathematics, problem-solving confidence, numeracy skills, Grade 9 students, mathematical competence, descriptive-correlational design, Minglanilla, Cebu.*

Language: *English*

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Introduction

Chapter 1
THE PROBLEM AND ITS SCOPE
INTRODUCTION

Rationale of the Study

The development of numeracy competence, confidence in problem solving, and a positive attitude towards mathematics has become a central focus in improving mathematics education globally, as these interrelated factors shape learners' ability to understand concepts, think critically, and apply mathematical skills to real-life situations. International research emphasizes that numeracy extends beyond basic computation; it involves interpreting information, making logical decisions, and solving everyday problems (Hodge et al., 2021). Likewise, confidence in problem solving has been consistently linked to students' perseverance, strategic thinking, and overall performance in mathematics (Zakariya et al., 2022). Meanwhile, students' attitude toward mathematics—whether positive or negative—plays a crucial role in shaping their motivation, engagement, and long-term success in the subject.

In the Philippine context, concerns about numeracy skills and learners' disposition toward mathematics continue to arise. National and international assessments show that Filipino students often struggle with mathematical reasoning, higher-order thinking skills, and real-life problem-solving tasks (Mangilala et al., 2021). The 2022 Programme for International Student Assessment (PISA) reported that the Philippines remains below the international average in mathematical literacy, with many learners demonstrating difficulties in applying mathematics to everyday scenarios (OECD, 2023). Similarly, the National Achievement Test (NAT) results reveal a persistent pattern of low performance in secondary-level mathematics, particularly in items requiring multi-step analysis and logical interpretation (Casildo, 2023).

These national trends are likewise reflected in many public schools across the country, including schools within the local community, where teachers observe that students struggle not only with basic numeracy tasks but also with sustaining confidence when faced with non-routine or unfamiliar problems. Many learners experience anxiety, lack of motivation, and negative attitudes toward mathematics, which further hinder their performance. Despite the Department of Education's ongoing initiatives such as the Rapid Mathematics Assessment (RMA) and numeracy strengthening programs—gaps in foundational skills remain visible, especially among Grade 9 learners who are expected to transition from basic arithmetic to more abstract mathematical concepts.

Grade 9 is a particularly challenging year, as the curriculum introduces topics that require both computational fluency and conceptual understanding. Students with weak numeracy foundations often rely on memorization rather than comprehension, leading to errors and loss of confidence when solving problems. Research also shows that negative attitudes such as fear of failure, low interest, or the belief that mathematics is inherently difficult—can diminish students' willingness to attempt challenging tasks, further widening performance gaps (Lara et al., 2025). In the context of a private secondary school in Minglanilla, Cebu, mathematics teachers have observed that a number of Grade 9 learners struggle to apply basic numerical concepts in problem-solving tasks despite having access to adequate learning resources and instructional support. Classroom observations and informal assessments reveal that some students exhibit hesitation when answering mathematical problems, avoid participation during problem-solving activities, and express low confidence in their mathematical abilities. These challenges are often accompanied by negative attitudes toward mathematics, such as anxiety during assessments and a tendency to perceive mathematics as a difficult and intimidating subject.

These local observations highlight the need to examine not only learners' numeracy competence but also their confidence in problem solving and overall attitude toward mathematics. Given these pressing concerns, it becomes essential to understand how these three dimensions interact within the context of local Grade 9 learners. By exploring these relationships, teachers and curriculum planners can better identify the specific barriers that hinder students' learning and develop targeted interventions to strengthen both skill and disposition.

Thus, this study, "Understanding Students' Numeracy Competence Through the Lens of Confidence in Problem Solving and Attitude Towards Mathematics," seeks to provide a localized and evidence-based understanding of the factors affecting learners' mathematical performance. The findings of this research will serve as a basis for designing an Enhancement Plan, which aims to support Grade 9 learners in cultivating positive mathematical mindsets, and improving overall learning outcomes in mathematics.

Theoretical Background

This study is anchored on the following theories: Albert Bandura's Social Cognitive Theory (1986) and Self-Efficacy Theory (1977), Jean Piaget's Cognitive Development Theory (1970), Carol Dweck's Growth Mindset Theory (2006), John Flavell's Metacognitive Theory (1979), and John Sweller's Cognitive Load Theory (1988).

This research is also legally anchored on Republic Act No. 10533, also known as "The Enhanced Basic Education Act of 2013"; DepEd Order No. 8, s. 2015, otherwise known as "Policy Guidelines on Classroom Assessment for the K-12 Basic Education Program; DepEd Orded No. 21, s. 2019, also known as "Policy Guidelines on the K - 12 Basic Education Program; and Republic Act No. 9155, also known as Governance of Basic Education Act of 2001.

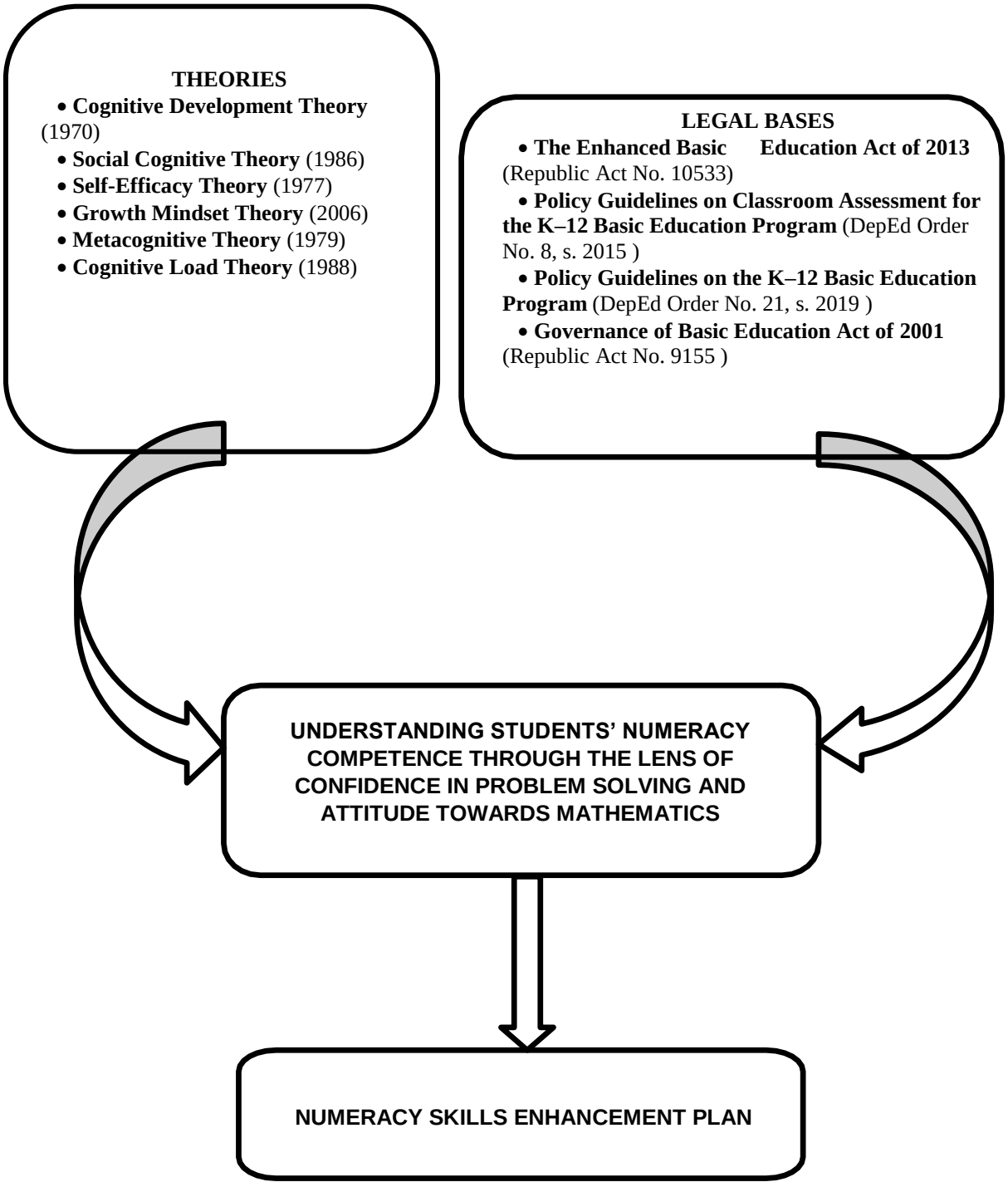

Figure 1: Theoretical-Conceptual Framework of the Study

Albert Bandura's Social Cognitive Theory (1986) posits that learning occurs through reciprocal interactions among personal factors, behavior, and environment, a process referred to as reciprocal determinism. This theory is particularly relevant in understanding how students develop numeracy competence, problem-solving confidence, and attitude toward mathematics because learning is shaped not only by individual ability but also by social context. In the mathematics classroom, students gain confidence and form attitudes by observing teachers demonstrate problem-solving strategies, seeing classmates engage successfully in tasks, and receiving constructive feedback from peers and adults. Positive social modeling fosters engagement, enhances confidence in problem solving, and cultivates a positive attitude toward mathematics, while negative social experiences or lack of guidance can increase anxiety and reduce both confidence and numeracy performance. Thus, Social Cognitive Theory provides a framework for understanding how classroom interactions and social influences shape students' mathematical competence as well as their affective responses to learning.

Bandura's Self-Efficacy Theory (1977) further emphasizes that students' beliefs about their capabilities strongly determine their motivation, persistence, and achievement in mathematics. Learners with high self-efficacy approach numeracy tasks with determination, maintain confidence when facing challenging problems, and are more likely to develop positive attitudes toward mathematics. Conversely, students with low self-efficacy are more prone to avoidance behaviors, negative attitudes, and decreased engagement, which can hinder the development of numeracy skills. Therefore, problem-solving confidence and attitude toward mathematics can be viewed as psychological mediators that directly influence the acquisition of numeracy competence, illustrating how self-perception drives both cognitive and affective aspects of learning.

Jean Piaget's Cognitive Development Theory (1970) explains that Grade 9 learners typically transition into the formal operational stage, a period characterized by the emergence of abstract reasoning, logical thinking, and systematic problem solving. Numeracy competence, particularly in algebra, geometry, and statistical reasoning, relies heavily on these cognitive abilities. When mathematical tasks match students' developmental readiness, learners experience mastery, which strengthens their problem-solving confidence and promotes positive attitudes toward mathematics. In addition, tasks that exceed cognitive capacity may lead to confusion, frustration, and negative attitudes, which can impede both confidence and the development of numeracy skills. Piaget's theory thus provides a developmental lens for understanding how the interplay of cognitive readiness, problem-solving confidence, and attitude contributes to successful mathematics learning.

Carol Dweck's Growth Mindset Theory (2006) offers insight into students' beliefs about their ability to develop mathematical skills. Learners with a growth mindset, who believe that effort and persistence can improve mathematical ability, are more likely to embrace challenges, sustain confidence in problem solving, and maintain positive attitudes toward mathematics. In contrast, learners with a fixed mindset may avoid difficult tasks, experience diminished confidence, and develop negative attitudes, which can hinder numeracy development. Growth mindset therefore provides a psychological foundation for improving both problem-solving confidence and attitudes, which in turn support the development of numeracy competence.

John Flavell's Metacognitive Theory (1979) emphasizes learners' ability to monitor, regulate, and evaluate their cognitive processes. In mathematics, metacognitive skills such as planning solutions, monitoring progress, and checking for errors enable students to approach problems systematically, increasing problem-solving confidence. Learners who are metacognitively aware are also more likely to develop positive attitudes toward mathematics, as they feel more in control of their learning and less frustrated when encountering difficulties. Hence, metacognitive competence strengthens both confidence and attitudes, which enhances numeracy performance and fosters deeper understanding of mathematical concepts.

John Sweller's Cognitive Load Theory (1988) highlights the limitations of working memory in processing complex information. When mathematics tasks impose excessive cognitive load, learners may experience confusion, frustration, and decreased confidence, which negatively affect both attitudes and numeracy competence. On the other hand, instruction that is scaffolded and appropriately sequenced reduces cognitive load, allowing students to acquire problem-solving skills, build confidence, and develop more positive attitudes toward mathematics. Cognitive Load Theory thus demonstrates how instructional design influences the simultaneous development of competence, confidence, and affective dispositions in mathematics learning.

The theoretical foundations of this study are further supported by Philippine educational policies that emphasize the integrated development of knowledge, skills, and attitudes:

The Enhanced Basic Education Act of 2013 (Republic Act No. 10533). This act institutionalized the K–12 program, extending basic education to strengthen foundational competencies in literacy and numeracy (Violon & Violon, 2024). It mandates the integration of critical thinking, problem-solving, and lifelong learning skills as core competencies across grade levels. The law serves as a cornerstone for ensuring that learners acquire essential mathematical

proficiency before advancing to higher education or the workforce.

Policy Guidelines on Classroom Assessment for the K–12 Basic Education Program (DepEd Order No. 8, s. 2015). This policy emphasizes the importance of formative and summative assessments to measure learners' numeracy performance and analytical reasoning (Sabado, 2021). It aligns with diagnostic tools such as the Rapid Mathematics Assessment (RMA), which helps identify numeracy gaps and guides appropriate instructional interventions.

Policy Guidelines on the K–12 Basic Education Program (DepEd Order No. 21, s. 2019). This order highlights the integration of problem-solving, reasoning, and communication skills in mathematics instruction (Cerezo et al., 2023). It calls for contextualized and learner-centered approaches that promote both skill mastery and confidence.

Together, these legal bases ensure that mathematics instruction in the Philippines not only builds computational competence but also fosters self-efficacy and resilience in problem solving.

Governance of Basic Education Act of 2001 (Republic Act No. 9155). This act emphasizes school-level accountability in creating supportive learning environments. It mandates that learning experiences should cultivate essential competencies, including numeracy, and foster critical thinking, confidence, and positive attitudes toward academic subjects such as mathematics (Uy & Ocampo, 2023).

Recent empirical studies have consistently established a positive association between numeracy skills and problem-solving confidence or self-efficacy. Numeracy, or mathematical literacy, as defined in foundational frameworks such as OECD's PISA 2022 Mathematics Framework, encompasses applied reasoning, modelling, and evaluation tasks, which are closely linked to students' confidence in solving realistic problems (OECD, 2022). This is complemented by a systematic review of intervention studies (project-based learning, mastery learning, feedback-oriented instruction) conducted by Zakariya (2022) and found consistent gains in Mathematics self-efficacy when learning designs targeted both skill and reflective affective components. Experimental study conducted by Nurhasanah et al. (2024) showed that project-based learning (PjBL) significantly improved both numeracy test scores and Mathematics self-efficacy. Similarly, the Concrete-Pictorial-Abstract (CPA) approach has been shown in several quasi-experimental studies to elevate numeracy outcomes alongside increased confidence, especially in early secondary school cohorts (Iyamuremye et al., 2025; Rozata et al., 2024). Likewise, studies on using digital tools and dynamic visualization further support this relationship. Zhang et al. (2023) and Barçın et al. (2023) reported that students exposed to dynamic visualization tools such as GeoGebra performed better on problem-solving tasks and exhibited higher self-efficacy than those engaged in static visual instruction.

Moderation effects have also emerged in international research, demonstrating that the link between self-efficacy and performance is influenced by contextual variables. Shimizu (2022) found that learning engagement moderates the relationship between self-efficacy, Math anxiety, and problem-solving performance, indicating that the predictive effect of self-efficacy strengthens when students are highly engaged. Kaskens et al. (2020) observed that teacher competency and classroom environment enhance the predictive power of children's self-efficacy and self-concept for numeracy development. Cross-country analyses used PISA 2022 data revealed that creative learning environments, combined with high self-efficacy correlate with stronger applied numeracy performance (Wang, Perry & Ide, 2023).

In the Philippines, empirical evidence similarly points to a positive association between numeracy and problem-solving confidence, although variations have been observed in measurement approaches, contextual factors, and effect sizes. Rodil (2024) documented that students' self-reported confidence often exceeds their actual problem-solving performance, suggesting that self- report measures should be complemented with objective assessments. Norcio and Villahermosa (2021) addressed this by developing a numeracy assessment tool centered on Grade 9 learners' understanding of quadratic equations, allowing objective skills to be compared with confidence ratings. Project COUNTS (Munda et al., 2024) and Project NUMEROS (Aguilario et al., 2025) are two program evaluation studies in junior high school that revealed significant pre- and post- test gains in numeracy performance but also noted that improvements in confidence and self-efficacy occur mostly when there is teacher guidance, coaching and contextualized tasks.

At the methodological level, Echavez et al. (2024) conducted a systematic review of literacy and numeracy studies in the Philippines and identified several recurring limitations, including small sample sizes, non-standardized instruments for measuring confidence, and inconsistent reporting of reliability and effect sizes. Across both international and Philippine research, several instructional approaches have been consistently associated with improved numeracy performance and higher confidence levels. Strategies such as Realistic Mathematics Education (RME), the Concrete–Pictorial–Abstract (CPA) approach, project-based learning, contextualized tasks, and the integration of digital visualization tools have demonstrated effectiveness when properly implemented. Methodologically, the more rigorous studies utilize quasi-experimental or true-experimental designs with pretest–posttest measures, employ validated instruments for assessing numeracy

and self-efficacy, and apply robust statistical analyses such as Pearson correlation, regression models, and moderation analyses. For instance, studies by Nurhasanah (2024) and Shimizu (2022) report measurable effect sizes and incorporate engagement and classroom factors as moderating variables.

Across the reviewed literature, numeracy and problem-solving confidence emerge as closely interrelated constructs. However, few studies in the Philippine context have directly examined this relationship, particularly among Grade 9 students, a critical stage marking the shift from concrete arithmetic to abstract mathematical reasoning. Most available studies focus on interventions or complex modeling rather than direct correlational analysis. This study addresses the gap by exploring the relationship between numeracy skills and problem-solving confidence among Grade 9 learners, providing insights into how cognitive and affective factors interact to shape mathematical learning during this key developmental stage.

THE PROBLEM

Statement of the Problem

This study assessed the attitudes towards Mathematics, problem-solving confidence, and numeracy skills of Grade 9 students at a secondary private school in Cebu Province for School Year 2025–2026 as a basis for Numeracy Skills Enhancement Plan.

Specifically, this study sought to answer the following questions:

1. What is the profile of the respondents in terms of:
   1.1 age and gender;
   1.2 parents' highest educational attainment; and
   1.3 combined family monthly income?
2. What is the level of the attitudes of the respondents towards Mathematics in terms of:
   2.1 Self-confidence;
   2.2 Value of Mathematics;
   2.3 Enjoyment in Mathematics; and
   2.4 Motivation in Mathematics?
3. What is the level of problem-solving confidence of the respondents?
4. What is the level of numeracy skills of the respondents?
5. Is there a significant relationship between the:
   5.1 respondents' attitudes towards Mathematics and their numeracy skills; and
   5.2 respondents' problem-solving confidence and their numeracy skills?
6. Based on the findings, what Numeracy Skills Enhancement Plan can be proposed?

Statement of the Null Hypotheses

Based on the objectives of the study, the following null hypothesis were tested at 0.05 level of significance:

Ho_1: There is no significant relationship between the respondents' attitudes towards Mathematics and their numeracy skills.

Ho_2: There is no significant relationship between the respondents' problem-solving confidence and their numeracy skills.

Significance of the Study

The present study, which examines the relationship between numeracy skills and problem-solving confidence among Grade 9 students holds considerable significance for several key stakeholders:

Department of Education. For policymakers and officials in the Department of Education, this research provides empirical evidence that may guide curriculum review and policy development in mathematics education. It highlights the importance of integrating both cognitive (numeracy) and affective (confidence) domains in mathematics learning, supporting the development of programs that enhance student performance and self-efficacy.

School Administrators. The results of this study can help school administrators design and implement intervention programs that strengthen both numeracy skills and confidence in problem-solving. Insights from this research may also inform school-based initiatives to address gaps in mathematics achievement and encourage a positive learning environment.

Teachers. Mathematics teachers can benefit from the study by gaining a deeper understanding of how numeracy and confidence interact in the classroom. The findings can help them choose more effective instructional strategies that not only improve mathematical proficiency but also build problem-solving confidence

Learners. The results of the study are beneficial to the students themselves, as it emphasizes the value of developing both strong numeracy skills and confidence in problem-solving. With increased awareness of these factors, learners may be motivated to engage more actively in mathematics, ultimately improving their academic performance and self-belief.

Parents. Parents can use the findings to better understand how their children's numeracy skills and confidence levels interact. This knowledge can encourage more effective parental support at home, whether through helping with problem-solving tasks or fostering a positive attitude towards mathematics learning.

School Community. The study supports the entire school community in promoting a culture that values both competence and confidence in mathematics. By recognizing the dual importance of

skills and attitudes, schools can cultivate a more holistic and supportive environment for learners.

Researcher. For the researcher, this study contributes to professional growth and expertise in the field of mathematics education. It provides firsthand experience in conducting empirical research and offers insights that may guide future academic and professional pursuits..

Future Researchers. This study serves as a useful reference for future studies exploring the interplay of numeracy skills, confidence, and other affective factors in mathematics education. It can also be replicated or extended to other grade levels or contexts, contributing to the growing body of literature on mathematics learning and self-efficacy.

RESEARCH METHODOLOGY

This section presented the research design, respondents, research environment, instruments used, data-gathering procedure, ethical considerations, scoring procedure, and statistical tools employed in the study.

Design

The present study utilized a descriptive–correlational research design. This design is appropriate for research that seeks to describe variables as they naturally occur within a population and to examine the degree of association between or among them without exerting experimental manipulation (Seeram, 2019).

Because the variables under investigation already exist and were not subjected to treatment or intervention, a correlational approach was deemed most suitable. This design allowed the researcher to obtain quantitative measures of attitudes, confidence, and numeracy competence through the use of standardized and adopted research instruments, and to statistically analyze their interrelationships. The results derived from this design further served as the empirical basis for formulating the proposed Numeracy Skills Enhancement Plan.

Flow of the Study

The study followed an Input–Process–Output (IPO) framework to organize the variables, research activities, and expected outcome of the investigation. This model provides a systematic representation of how the study was carried out in relation to the research problems and intended output. Figure 2 illustrates the process of data gathering.

This phase included the identification of the respondents' profiles (age, gender, parents' highest educational attainment, and combined monthly income), their attitudes toward Mathematics in terms of self-confidence, value of Mathematics, enjoyment, and motivation, their level of problem-solving confidence, and their numeracy skills as assessed through the adapted numeracy test. The input also included the determination of the significant relationships between (a) attitudes toward Mathematics and numeracy skills, and (b) problem-solving confidence and (c) numeracy skills.

The process phase involved the major research activities undertaken in the study, such as the selection of respondents through purposive sampling, administration of the adopted research instruments, and the organization, tabulation, and statistical treatment of the gathered data. Appropriate statistical tools—including frequency, percentage, mean, standard deviation, and Pearson r correlation—were applied to analyze and interpret the findings in alignment with the research objectives.

Based on the results of the data analysis, the researcher developed a Numeracy Skills Enhancement Plan. This enhancement plan aims to improve learners' numeracy skills and strengthen their problem-solving confidence through regular diagnostic assessments, guided feedback, and targeted learning activities. The plan serves as the practical output of the study and is intended to address identified gaps in numeracy performance and confidence among Grade 9 students.

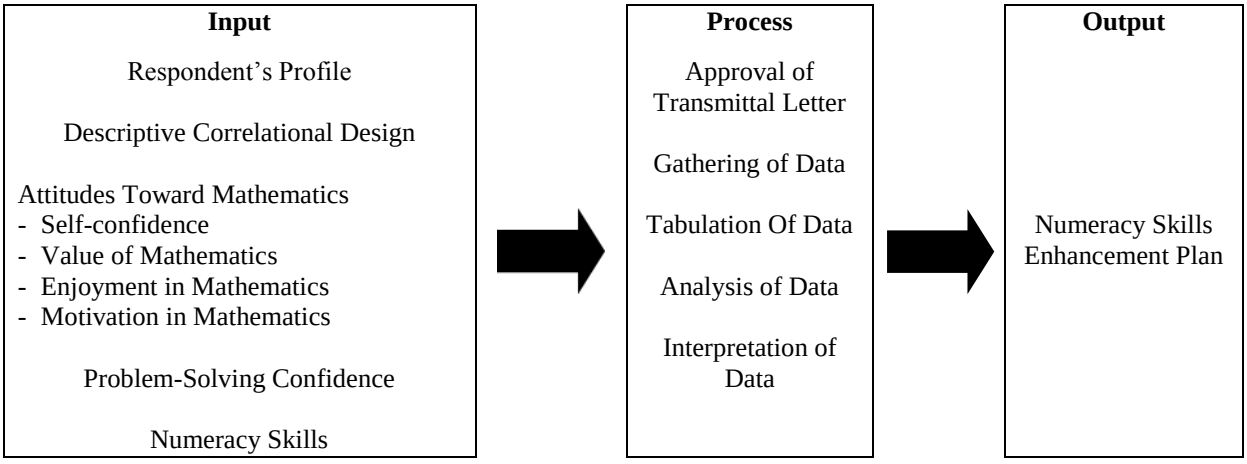

Figure 2. Flow of the Study

Environment

The study was conducted at a private school in Minglanilla, Cebu. This school implement the Department of Education's K–12 Basic Education Curriculum and offer Grade 9 Mathematics, making this a suitable site for assessing numeracy skills, attitudes toward Mathematics, and problem-solving confidence.

Figure 3. Location Map of the Research Environment

The institution maintains classrooms equipped with essential learning resources and instructional materials that facilitate the delivery of mathematics lessons, including numeracy-focused activities, problem-solving tasks, and performance-based assessments. Teachers regularly implement varied

teaching strategies to cater to different learner needs, making the school a suitable setting for examining students' numeracy competence, problem-solving confidence, and attitudes toward mathematics.

The presence of supportive school administrators, trained mathematics teachers, and established academic programs contributes to an environment conducive to data collection. The school's commitment to continuous improvement and learner development ensures that the findings of this study are relevant for enhancing mathematics instruction and supporting evidence-based educational practices.

Respondents

The respondents of this study were Grade 9 learners enrolled during School Year 2025–2026. They were selected through purposive sampling, a method appropriate for identifying individuals who meet specific criteria relevant to the study; namely, students currently exposed to mathematics lessons that develop numeracy skills, attitudes toward Mathematics, and problem-solving confidence. This sampling technique ensured that the data collected would be meaningful and directly aligned with the objectives of the study. The sample distribution of the respondents is presented in Table 1 below.

Table 1 - Distribution of the Respondents

Grade 9	n	%
Section 1	49	49.00
Section 2	51	51.00
Total	**100**	**100.00**

The respondents of this study were 100 Grade 9 students enrolled at St. Cecilia's College – Cebu, Inc. during the academic year. They were selected to participate because Grade 9 is a critical stage in the development of numeracy competence, particularly in algebraic reasoning, problem-solving, and higher-order mathematical skills.

As shown in the table, the respondents were distributed across two Grade 9 sections. Section 1 consisted of 49 students (49%), while Section 2 had 51 students (51%). This nearly equal distribution ensures balanced representation across the grade level, supporting fair and reliable analysis of students' numeracy skills, problem-solving confidence, and attitudes toward mathematics.

Instrument

The researcher utilized adopted research instruments to obtain the data necessary for the study. These instruments measured the respondents' profile, attitudes toward Mathematics, problem-solving confidence, and numeracy skills. The instruments used were as follows:

Part I. Profile of the Respondents. This section was designed to gather demographic information from the respondents. The profile included: name(optional), age, gender, parents' highest educational attainment, and combined monthly income.

Part II. Students' Attitude Toward Mathematics. This scale measured the attitudes of Grade 9 learners toward Mathematics across four domains: self-confidence in Mathematics, value of Mathematics, enjoyment in Mathematics, and motivation in Mathematics. It was adopted from the Attitude towards Mathematics Inventory questionnaire by Tapia and Marsh (2004). The instrument consisted of positively and negatively worded items rated on a 5-point Likert scale (1–Strongly Disagree to 5–Strongly Agree). Higher mean scores reflected more positive attitudes toward Mathematics.

Part III. The Problem-Solving Confidence of the Learners. This part measured the confidence level of Grade 9 students in solving mathematics problems. It was adopted from the Problem-Solving Confidence Questionnaire developed by Gok (2012). The instrument consisted of 20 worded statements reflecting students' confidence in problem solving, rated on a 5-point Likert scale: (1–Strongly Disagree to 5–Strongly Agree). Higher scores indicated higher problem-solving confidence in numeracy.

Part IV. The Numeracy Test. This part assessed the numeracy skills of the Grade 9 students. The 40-item numeracy test adopted from Department of Education's Rapid Mathematics Assessment (RMA), which covered essential mathematical concepts and problem-solving skills aligned with the Grade 9 mathematics curriculum. The items included operations involving polynomials, solving linear and quadratic equations using various methods (factoring, completing the square, and the quadratic formula), and problems on direct variation. The test was designed to measure students' understanding, computation, and application skills in mathematics. Each correct answer was given one point, and the total score represented the student's numeracy level. Higher scores indicated higher numeracy proficiency.

Data Gathering Procedures

Preparatory Stage. The researcher sent a letter to the office of the school's division superintendent at the Department of Education, Cebu Province Division. After it was approved, the researcher carried the letter by hand and gave it to the school principal of the school to formally inform the researcher's intention and to schedule a meeting with the teacher and student respondents for the conduct of the survey.

Data Gathering Stage. On the scheduled day of data collection, the researcher conducted an orientation session last November 26,2025 to explain the purpose of the study, the procedures involved, and the rights and protections of the participants. Ethical considerations—including voluntary participation, the right to withdraw at any time, and assurances of confidentiality—were clearly emphasized. The respondents were informed that their personal information and responses would be handled in compliance with data privacy standards and used solely for academic purposes.

After the orientation, the survey questionnaires were administered on the same day. Clear instructions were provided on how to accomplish each part of the instrument. The researcher remained available to clarify questions while ensuring that responses were completed independently. Sufficient time was allotted for answering, and all completed questionnaires were retrieved immediately after the session to maintain data integrity and confidentiality.

Post Data Gathering Stage. When the scores were carefully gathered, it was individually encoded and tabulated using Excel. The variables which were found in the statement of the problem were extracted, using a summary sheet that contains all the required information from this study. Then, the data were statistically treated, analyzed, and tabulated orderly. Furthermore, the interpretations were made possible based on the outcomes from the statistical tools used. Likewise, the data from the outcome was discussed in parallel according to the arrangement presented in the statement of the problem. To validate the data more, additional related studies were provided to elaborate the discussion.

Statistical Treatment of Data

After data collection, the data gathered had undergone different statistical treatments with the aid of the statistician. To arrive at reliable results, the following statistical tools were used:

Frequency. This tool was used to determine the number of characteristics in which the respondents fell in the same category, particularly in the profile. Each response was recorded and tallied.

Simple Percentage. This tool was utilized to describe the proportion of the respondents who belong to the same category as the total number of respondents specifically on their profile.

Weighted Mean. The mean was used to determine the respondents' overall level of attitudes toward Mathematics, their problem-solving confidence, and their numeracy skills.

Standard Deviation. This measure was used to determine the variability or dispersion of the respondents' scores from the mean in the attitude scale, problem-solving confidence scale, and numeracy test.

Spearman Rho (rho). This statistical tool was used to determine the significance of the relationship between attitudes toward Mathematics and numeracy skills, and problem-solving confidence and numeracy skills.

Scoring Procedure

Data that were collected through the research instruments were calculated and interpreted according to the following procedures:

To determine the respondents' attitude towards Mathematics, the responses from the Likert-scale questionnaire adopted from Tapia and Marsh (2004) were tallied and interpreted using the scale below. Each item was rated on a five-point Likert scale, with responses ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The weighted mean and standard deviation were computed per item, per domain (self-confidence, value of math, enjoyment of math, and motivation), and as a composite score. These were interpreted using the following scale:

Table 2

Scale	Numerical rating	Descriptive Rating	Description
5	4.21 – 5.00	Very Positive	The student consistently demonstrates a very positive attitude toward Mathematics, showing strong interest, enjoyment, and confidence in engaging with mathematical tasks.

4	3.41 – 4.20	Positive	The student generally shows a positive attitude toward Mathematics, with interest and willingness to learn, though occasional doubts or hesitations may arise.
3	2.61 – 3.40	Neutral	The student sometimes feels comfortable with Mathematics but may show mixed feelings, experiencing both interest and uncertainty depending on the task.
2	1.81 – 2.60	Negative	The student often displays a negative attitude toward Mathematics, frequently feeling hesitant, discouraged, or unsure when working with mathematical concepts.
1	1.00 – 1.80	Very Negative	The student rarely demonstrates a positive disposition toward Mathematics and often shows avoidance, discomfort, or strong doubts about their mathematical abilities.

To determine the respondents' level of problem-solving confidence, the responses from the Likert-scale questionnaire adopted from Gok (2012) were tallied, scored, and interpreted using the scale below. Each item was rated on a five-point Likert scale, with responses ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

Table 3

Scale	Numerical rating	Descriptive Rating	Description
5	4.21 – 5.00	Very High Confidence	The student consistently demonstrates very high confidence in solving mathematics problems and believes strongly in their ability to succeed in numeracy tasks.
4	3.41 – 4.20	High Confidence	The student generally shows high confidence in solving mathematics problems, with only minor doubts or hesitations.
3	2.61 – 3.40	Moderate Confidence	The student sometimes feels confident in solving mathematics problems but may experience occasional self-doubt or uncertainty.
2	1.81 – 2.60	Low Confidence	The student often lacks confidence when faced with mathematics problems and may be hesitant in applying problem-solving strategies.
1	1.00 – 1.80	Very Low Confidence	The student rarely demonstrates confidence in solving mathematics problems and often doubts their ability in numeracy.

To determine the respondents' level of numeracy skills, the 40-item numeracy test was scored by assigning one point for each correct answer and zero for each incorrect answer. The total score was computed for every learner, and the results were interpreted using the numeracy mastery-level scale presented below.

Table 4

Score Range	Numeracy Level	Description
33–40	Advanced	Demonstrates excellent numeracy and reasoning ability.
25–32	Proficient	Strong understanding and problem-solving skills.
17–24	Basic	Understands fundamental concepts; minor errors in complex problems.
9–16	Developing	Limited skills; needs guided practice.
0–8	Beginning	Struggles with basic numeracy skills; needs remediation.

To determine the relationship between the variables, the study employed the Spearman Rho (rho). This statistical tool was used to examine the relationship between:

(1) the respondents' attitudes toward Mathematics and their numeracy skills, and

(2) their problem-solving confidence and numeracy skills.

Ethical Considerations

This study was conducted in accordance with accepted ethical standards in educational research to ensure the protection, dignity, and welfare of all participants. Prior to data collection, permission to conduct the study was secured from the school administration. Participation of the respondents was voluntary, and informed consent was obtained, emphasizing that participants had the right to withdraw from the study at any stage without any penalty.

Confidentiality and anonymity of the respondents were strictly maintained. No names or personally identifiable information were recorded in the research instruments. Codes were used in place of identities to ensure that individual responses could not be traced back to specific participants.

In compliance with the Data Privacy Act of 2012 (Republic Act No. 10173), all data gathered were used solely for academic and research purposes. Collected data were securely stored and accessed only by the researcher. Electronic files were password-protected, while printed materials were kept in a secured location. After the completion of the study, all data will be properly disposed of following ethical research guidelines.

Overall, the study ensured that ethical principles of respect, beneficence, and integrity were upheld throughout the research process.

DEFINITION OF TERMS

The following terms are operationally defined according to how it is used in the study for better understanding:

Attitude Toward Mathematics (ATM). Refer to a learner's overall disposition, feelings, and beliefs about mathematics, including their interest, enjoyment, and perceived value of the subject. In this study, it is measured through students' responses to indicators such as: Enjoyment of mathematics, Interest and motivation, Perceived usefulness, and Confidence in learning mathematics .

Enjoyment in Mathematics. This refers to the level of pleasure or interest respondents experience when engaging in mathematical activities, as reflected in their responses to the enjoyment component of the attitude questionnaire.

Grade 9 Students. In the context of this research, they are enrolled under the K to 12 Basic Education Curriculum in public and private junior high schools for the school year 2025–2026 within the research locale who will participate as respondents.

Motivation in Mathematics. This refers to the respondents' willingness and drive to engage in learning mathematics and complete mathematical tasks, as measured by the motivation indicators in the

survey.

Numeracy Skills. This refers to the Grade 9 students' ability to perform mathematical operations, interpret quantitative information, and apply problem- solving strategies aligned with the K to 12 Mathematics Curriculum of the Department of Education (DepEd). These skills will be measured using a researcher-made numeracy test based on competencies in algebra, geometry, and statistics for Grade 9.

Numeracy Skills Enhancement Plan. This refers to the intervention program proposed in the study to improve the numeracy skills and problem-solving confidence of Grade 9 students. Operationally, it includes structured and scaffolded mathematics activities aligned with the K–12 curriculum, with effectiveness measured through students' numeracy test scores and problem-solving confidence levels.

Problem-Solving Confidence. This term refers to the learners' self- assurance in handling mathematical problems as reflected in their willingness to attempt, persist, and complete problem-solving tasks. In this study, it will be measured using a Likert-scale questionnaire adopted from Gok (2012)

Self-Confidence in Mathematics. This refers to the respondents' perceived belief in their ability to understand and perform mathematical tasks, based on the self-confidence component of the attitude questionnaire.

Value of Mathematics. This refers to the extent to which respondents perceive mathematics as useful, important, and relevant to daily life and future career, as measured by the value-of-math indicators in the survey.

Chapter 2
PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

This chapter presented the analyses and interpretations of the data gathered from the study which aimed to determine the profile of the respondents in terms of their age, gender, parents' highest educational attainment, and combined family monthly income. This also assessed the numeracy competence of the respondents through numeracy test, problem solving confidence and their attitudes towards mathematics in terms of self-confidence, value of math, enjoyment in math, and motivation math. Furthermore, the relationship of the respondents' numeracy competence and attitudes towards mathematics and [problem solving confidence was also considered.

With the help of the respondents' answers to the survey questionnaire, the following results and findings are hereby presented and discussed as follows:

PROFILE OF THE RESPONDENTS

This section presented the profile of the respondents in terms of their age, gender, parents' highest educational attainment, and combined family monthly income.

Table 5 - Age and Gender of the Respondents

Age (in years)	Female		Male		Total	
	f	%	f	%	f	%
16 and above	3	3.00	2	2.00	5	5.00
15	11	11.00	15	15.00	26	26.00
14	39	39.00	30	30.00	69	69.00
Total	**53**	**53.00**	**47**	**47.00**	**100**	**100.00**
Mean: 14.37	**St.Dev. 0.61**					

Age and gender are considered important variables that need to be determine in this study which could help in explaining the results of the study. Data gathered are presented in Table 5 below.

As shown in Table 5, there were 53 out of 100 respondents who are female students which comprised 53.00 percent of the respondents while there were 47 or 47.00 percent of them were male students. Thirty – nine or 39.00 percent of the female students were 14 years old followed by 11 or 11.00 percent of them were 15 years old. Moreover, there were 30 or 30.00 percent of the male respondents with of 14 years old and only fifteen or 15.00 percent of them had age 15 years old. It can be noted that the male respondents were older than the female respondents. However, the age of the respondents was within the expected age of the regular Grade 9 students. This implies that most of them had entered school on the proper age requirement by DepEd. Delaying the entry of students in school in order to

have advantage on their peers or retaining them to a certain grade level to ensure that they have achieved at that level could be an impractical strategy to improve students' achievement. According to Orbeta et al. (2021), students are more likely the low performers because these are those who are retained or stopped schooling at certain levels.

Parents' Highest educational Attainment

Parent's highest educational attainment is an important demographic factor that may influence students' academic behavior and numeracy development. Understanding this profile variable helps in explaining possible variations in the study's results. Data gathered are presented in Table 6 below.

Table 6 - Parents' Highest Educational Attainment

Highest Educational Attainment	Father		Mother	
	f	%	f	%
Doctorate Graduate	2	2.00	2	2.00
With Doctorate Units	0	0.00	1	1.00
Master's Graduate	4	4.00	1	1.00
With Master's Units	2	2.00	4	4.00
College Graduate	58	58.00	68	68.00
College Level	12	12.00	9	9.00
High School Graduate	12	12.00	14	14.00
High School Level	7	7.00	1	1.00
Elementary Graduate	0	0.00	0	0.00
Elementary Level	2	2.00	0	0.00
No Formal Education	1	1.00	0	0.00
Total	**100**	**100.00**	**100**	**100.00**

Table 3 showed the distribution of parents' highest educational attainment as reported by the respondents. The results indicate that the majority of both fathers (58%) and mothers (68%) are college graduates, suggesting a generally well-educated parental population. Having a substantial number of parents who completed higher education may contribute to stronger academic support at home, as parents with higher educational attainment tend to value schooling and are more capable of assisting their children academically. According to Jin (2023), parental education remains one of the strongest predictors of student learning outcomes, as parents with college backgrounds often provide more structured learning environments.

Furthermore, a number of parents also reported being college level (fathers 12%; mothers 9%) or high school graduates (fathers 12%; mothers 14%). This indicates that although a significant portion attained tertiary education, there is still a notable group whose formal schooling stopped at secondary level. Research by Davis‑Kean et al. (2021) emphasizes that parental education shapes the cognitive stimulation children receive at home, suggesting that differing educational backgrounds may lead to varied levels of academic engagement and support.

The table also shows a smaller percentage of parents holding postgraduate degrees (doctorate and master's), ranging from 1–4%. This group, though limited in number, may reflect families with strong academic orientation and higher educational aspirations. A study by Bener et al. (2021) found that parents with advanced degrees demonstrate higher expectations for their children's educational performance, which often translates to more positive learner outcomes.

Very few parents completed only elementary education or had no formal schooling. While this represents a minor proportion of the sample, it is essential to recognize that parents with lower educational attainment may face challenges in providing academic assistance at home. Davis‑Kean et al. (2021) argue that lower parental education is often associated with reduced confidence in guiding children's schoolwork, though it does not diminish their motivation to support their children.

In general, the results show that the respondents come from families where most parents have achieved higher levels of education, particularly college degrees. This may have positive implications for the learners' academic environments, as higher parental education is frequently associated with greater educational support, enhanced motivation, and stronger emphasis on schooling.

Combined Family Income

The respondents' monthly family income is a key socioeconomic variable that may affect learning opportunities, access to resources, and overall academic performance. This information helps contextualize the outcomes of the study. Data gathered are presented in Table 7 below.

Table 7 - Respondents' Combined Family income

Description of Monthly Income	Monthly Income (in pesos)	f	%
High-income households	76,700 and above	15	15.00
Upper-middle-income households	between 43,829-76,699	18	18.00
Middle-income households	between 21,915-43,828	32	32.00
Lower-middle-income households	between 10,957-21,914	22	22.00
Low-income households	less than 10,957	13	13.00
	Total	**100**	**100.00**

Table 7 showed the distribution of the respondents' combined family income. The results reveal that the largest proportion of respondents (32%) belong to families earning between ₱21,915–₱43,828 monthly, placing them within the lower-middle to middle-income bracket. Families in this range are generally able to meet basic needs but may still experience financial limitations in terms of educational expenses and enrichment activities. According to Catacutan et al. (2024), Filipino households within the middle-income spectrum often balance essential needs with limited discretionary spending, which may affect the level of educational support they can provide.

A substantial portion of the respondents also come from families earning ₱10,957–₱21,914 (22%), indicating that nearly one-fourth fall within lower-income categories. Families in this income range may face economic pressures that influence children's schooling experiences, such as limited access to learning materials at home. Mistry et al. (2021) found that financial strain can affect students' overall learning conditions, particularly in early childhood and elementary levels, where parental provision of resources plays a critical role.

Conversely, 15% of respondents belong to higher-income households earning ₱76,700 and above, while another 18% fall between ₱43,829–₱76,699. These groups represent upper-middle to high-income families who typically have greater financial capacity to support academic needs, such as supplemental learning programs, digital devices, or additional tutoring. Research by Paulus, Spinath, and Hahn (2021) emphasizes that higher socioeconomic status is associated with greater access to educational opportunities and a more conducive home learning environment.

Meanwhile, 13% of the respondents belong to households earning less than ₱10,957, reflecting economically vulnerable families. Children from low-income households often encounter challenges related to resource availability, parental time for academic supervision, and stable learning routines. Xia (2024) assert that socioeconomic disadvantage can influence a child's academic readiness and engagement, although supportive school environments can help mediate these effects.

In general, the results indicate that the respondents come from diverse socioeconomic backgrounds. This range of financial conditions may influence the learners' access to academic resources, and overall educational experiences.

LEVEL OF RESPONDENTS' ATTITUDES TOWARDS MATHEMATICS

The overall attitude of students toward mathematics is a key affective factor that can influence their motivation, engagement, and academic performance. Assessing their general attitude provides a comprehensive understanding of how they perceive and respond to mathematical tasks.

Self-confidence

Self-confidence in mathematics reflects students' belief in their ability to perform mathematical tasks. Measuring this component of attitude helps explain its influence on numeracy competence. Data gathered are presented in Table 8.

Table 8 - Level of respondents' attitudes towards Mathematics in terms of self-confidence

S/N	Indicators	WM	SD	Verbal Description
1	Mathematics is a standout amongst my most feared subjects.	3.38	1.02	Neutral
2	My mind goes blank, and I am unable to think clearly when working with math.	3.10	1.06	Neutral
3	Studying mathematics makes me feel nervous.	2.77	1.17	Neutral
4	Mathematics makes me feel uncomfortable.	2.36	1.11	Negative
5	I am constantly under an awful strain in a math class.	2.71	1.08	Neutral
6	When I hear the word mathematics, I feel uneasy.	2.31	1.19	Negative
7	It makes me nervous to even think about completing a math problem.	2.73	1.35	Neutral
8	Mathematics does not scare me at all.	2.72	1.10	Neutral

9	I expect to do well in any math class I take.	3.02	1.07	Neutral
10	I am constantly confused in my math class.	2.96	1.09	Neutral
11	I have a lot of self-confidence when it comes to mathematics.	2.62	1.07	Neutral
12	I am able to solve math problems without much difficulty.	2.73	1.21	Neutral
13	I feel insecure when trying to do mathematics.	3.00	1.23	Neutral
14	I learn mathematics easily.	2.82	1.05	Neutral
15	I believe that I am good at solving math problems.	2.78	1.10	Neutral
	Aggregate Mean	**2.80**		**Neutral**
	Aggregate Standard Deviation		**1.13**	

Legend: 4.21-5.00-Very Positive; 3.41-4.20- Positive ; 2.61-3.40-Neutral; 1.81-2.60-Negative;1.00-1.80-Very Negative

Table 5 showed the level of respondents' attitudes towards Mathematics in terms of self-confidence. The results reveal that the overall aggregate mean of 2.80 indicates a Neutral attitude, suggesting that respondents neither strongly believe in nor strongly doubt their mathematical abilities. This neutrality reflects a balanced yet uncertain disposition toward mathematics, where learners experience both moments of confidence and hesitation.

The table further shows that several indicators—specifically items 4 (WM = 2.36) and 6 (WM = 2.31)—obtained Negative verbal descriptions. These indicators are negatively worded items expressing discomfort and uneasiness toward mathematics. Negative reactions such as these are common signs of mild math anxiety, characterized by feelings of discomfort and worry in math-related situations. According to Victor‑Edema (2024), math anxiety continues to influence learners' emotional responses toward mathematics, often triggered by early experiences of difficulty or pressure in solving mathematical tasks.

On the other hand, the majority of the indicators—such as "Studying mathematics makes me nervous," "I expect to do well in any math class," and "I learn mathematics easily"- received Neutral ratings. This suggests that learners do not completely fear mathematics, but they are also not fully confident in their abilities. Neutrality in mathematical self-confidence reflects a transitional mindset where students may be open to improving but still lack consistent belief in their skills. In a study by Boaler (2022), students' moderate confidence levels often stem from inconsistent learning experiences, where success in some areas of math is overshadowed by difficulty in more complex tasks.

Meanwhile, items that measure positive self-belief, such as "I believe that I am good at solving math problems" (WM = 2.78) and "I have a lot of self-confidence when it comes to mathematics" (WM = 2.62), also fall under the Neutral category. This implies that while students do not explicitly perceive themselves as weak in mathematics, they have not yet developed strong confidence in their mathematical capabilities. Fitz and Price (2025) emphasize that developing strong mathematical self-concept requires continuous reinforcement, positive learning experiences, and supportive instructional practices.

In general, the results show that respondents hold a Neutral level of self-confidence in mathematics. This may mean that learners do not exhibit strong anxiety, but they also lack the firm confidence needed to excel in mathematical tasks. Research by Brewster (2023) highlights that students with moderate or neutral math self-confidence often benefit significantly from instructional strategies that build assurance, such as mastery-based learning and scaffolded problem-solving activities.

Overall, these findings suggest that while respondents do not fear mathematics intensely, there remains a need to strengthen their confidence and reduce lingering feelings of discomfort, especially among learners who reported negative reactions toward mathematical tasks.

Value of Mathematics

The value students place on mathematics indicates their perception of the subject's importance and usefulness. This dimension is essential in understanding motivation and engagement. Data gathered are presented in Table 9 below.

Table 9 - Level of respondents attitudes towards Mathematics in terms of Value of Mathematics

S/N	Indicators	WM	SD	Verbal Description
1	Mathematics is an essential and necessary subject.	4.12	1.08	Positive
2	I want to develop my mathematical skills.	4.54	0.81	Very Positive
3	Mathematics helps develop the mind and teaches us to think.	4.19	0.83	Positive
4	Mathematics is essential in everyday life.	3.88	1.06	Positive

5	Mathematics is one of the most important subjects for people to study.	4.10	0.86	Positive
6	High school math courses would be useful regardless of my career path.	4.01	0.97	Positive
7	I can think of many ways that I use math outside of school.	3.61	1.09	Positive
8	Studying advanced mathematics is useful.	4.06	0.97	Positive
9	Studying math helps me with problem-solving in other areas.	3.93	0.91	Positive
10	A solid math foundation could help me in my professional life.	4.00	0.93	Positive
	Aggregate Mean	**4.04**		**Positive**
	Aggregate Standard Deviation		**0.95**	

Table 9 showed the level of respondents' attitudes towards Mathematics in terms of the value of math. The table reveals an aggregate mean of 4.04, which corresponds to a Positive verbal description. This indicates that respondents generally recognize the importance, usefulness, and relevance of mathematics in both academic and real-life contexts.

The results show that respondents strongly acknowledge mathematics as beneficial, especially with Item 2 (WM = 4.54) obtaining a Very Positive rating. This reflects a strong desire among learners to further develop their mathematical skills. According to Morano et al. (2023), students' motivation to enhance mathematical abilities is closely linked to their belief in math's long-term usefulness and its role in cognitive development.

Most indicators, such as "Mathematics is an essential subject," "Mathematics helps develop the mind," and "Math is essential in everyday life", received Positive responses. These items highlight the respondents' awareness of math's significance across various domains. In the study of DiNapoli and Miller (2022), students who perceive mathematics as valuable tend to demonstrate greater engagement and persistence when solving mathematical tasks because they believe math contributes directly to critical thinking and logical reasoning.

Responses also show a strong acknowledgment of math's role beyond school settings. For instance, Item 7 (WM = 3.61) indicates that many respondents can identify ways they apply math in daily situations, such as budgeting, measuring, and interpreting information. This is consistent with the findings of Morano et al. (2023), who reported that students' real-world experiences significantly influence their appreciation of math's practicality.

Moreover, respondents expressed positive attitudes toward the importance of mathematics in future careers, with items such as "A solid math foundation could help me in my professional life" (WM = 4.00) and "High school math courses are useful regardless of my career path" (WM = 4.01). Tan and Lim (2024) emphasize that learners who view math as essential to their future employment are more likely to engage deeply with mathematical content and see its long-term relevance in a global workforce increasingly dependent on quantitative skills.

In general, the results show that respondents highly value mathematics, recognizing both its academic benefits and its application in everyday life. This positive perception may reflect the effectiveness of classroom instruction, increased exposure to real-life math applications, and growing awareness of math's relevance across careers and life situations. Such valuing of mathematics is essential, as noted by Roche et al. (2023), who argue that students who appreciate the relevance of mathematics are more likely to approach the subject with confidence, motivation, and sustained interest.

Enjoyment in Mathematics

Enjoyment in mathematics represents the emotional aspect of learning the subject, which may significantly influence performance and persistence. This indicator is examined to determine its contribution to numeracy outcomes. Data gathered are presented in Table 10 below.

Table 10 - Level of respondents attitudes towards Mathematics in terms of Enjoyment in Mathematics

S/N	Indicators	WM	SD	Verbal Description
1	I get much satisfaction out of solving a math problem.	3.60	1.23	Positive
2	I have generally enjoyed studying math in school.	3.14	0.96	Neutral
3	Mathematics is dull and boring.	2.11	0.89	Negative
4	I like to tackle new problems in mathematics.	2.88	1.03	Neutral

5	I would rather complete a task in math than write an essay.	2.80	1.44	Neutral
6	I like mathematics.	3.13	1.13	Neutral
7	I am happier in a mathematics class than in any other class.	2.68	1.08	Neutral
8	Mathematics is an interesting subject.	3.81	0.92	Positive
9	I am comfortable expressing my own ideas on how to solve a difficult math problem.	2.74	1.02	Neutral
10	I am comfortable answering questions in math.	2.92	0.93	Neutral
	Aggregate Mean	**2.98**		**Neutral**
	Aggregate Standard Deviation		**1.06**	

Table 10 showed the level of respondents' attitudes towards Mathematics in terms of enjoyment in math. The table reveals an aggregate mean of 2.98, which corresponds to a Neutral verbal description. This suggests that respondents neither strongly enjoy nor strongly dislike mathematics. Their attitudes reflect a moderate stance where some aspects of math are appealing, while others may still pose challenges or discomfort.

The results show that the highest-rated indicators—Item 1 (WM = 3.60) and Item 8 (WM = 3.81)—obtained Positive descriptions. These items highlight that many respondents find satisfaction in solving math problems and consider mathematics an interesting subject. Students who perceive problem-solving as enjoyable often experience deeper engagement and persistence. According to Jones (2023), enjoyment in academic tasks enhances intrinsic motivation, allowing learners to sustain interest even when tasks become more challenging.

However, the findings also show that Item 3 (WM = 2.11) received a Negative rating, reflecting that some students still see mathematics as dull or boring. Negative perceptions like these may stem from past difficulties or teaching approaches that do not align with students' preferred learning styles. Anh and Duong (2023) found that students' enjoyment of mathematics significantly increases when learning experiences are interactive, meaningful, and connected to real-life contexts.

Most of the items—including "I have generally enjoyed studying math," "I like mathematics," "I am happier in a mathematics class," and "I am comfortable answering questions in math"—received Neutral ratings. This suggests that while students acknowledge some positive aspects of mathematics, they do not consistently experience enjoyment or comfort in math-related activities. Neutral responses often indicate inconsistent experiences, where students may enjoy mathematical activities under certain conditions but struggle in others. In the study of Hettinger et al. (2023) students with moderate enjoyment in math tend to fluctuate in engagement depending on task difficulty, classroom climate, and the support they receive from their teachers.

Additionally, the neutral ratings on items related to participation—such as expressing ideas during problem solving or answering questions in class—imply that students may still lack full confidence in contributing during math discussions. Aulia (2024) emphasized that classroom environments that encourage risk-taking and value student reasoning significantly increase enjoyment and willingness to participate.

In general, the results show that respondents have a neutral level of enjoyment in mathematics. This indicates that while students recognize the interesting and satisfying aspects of math, they do not consistently experience joy or comfort in mathematical activities. As noted by Sujatha and Vinayakan (2023), fostering enjoyment in math requires engaging instructional strategies, supportive classroom interactions, and opportunities for students to experience meaningful mathematical success.

Motivation in Mathematics

Motivation in mathematics reflects the level of effort students are willing to exert when engaging with mathematical tasks. Assessing this factor helps clarify its role in developing numeracy skills. Data gathered are presented in Table 11 below.

Table 11 - Level of respondents attitudes towards Mathematics in terms of Motivation in Mathematics

S/N	Indicators	WM	SD	Verbal Description
1	I am confident that I could learn advanced mathematics.	2.85	1.16	Neutral
2	I would like to avoid using mathematics in school.	2.28	1.00	Negative
3	I will take more than the required number of mathematics subjects.	2.50	0.85	Negative
4	I plan to take as much mathematics as I can during my education.	3.01	0.97	Neutral

5	The challenge of mathematics appeals to me.	3.22	0.94	Neutral
	Aggregate Mean	**2.77**		**Neutral**
	Aggregate Standard Deviation		**0.98**	

Table 11 showed the level of respondents' attitudes towards Mathematics in terms of motivation in math. The table reveals an aggregate mean of 2.77, which corresponds to a Neutral verbal description. This indicates that the respondents exhibit a moderate level of motivation toward learning mathematics. They do not fully avoid the subject, yet they are not highly driven to pursue extensive math learning beyond what is required.

Two indicators—Item 2 (WM = 2.28) and Item 3 (WM = 2.50)—obtained Negative verbal descriptions. These negatively worded indicators suggest that some respondents prefer to avoid using mathematics in school and are not inclined to take more math subjects beyond the required courses. Negative motivation may stem from previous challenging experiences or perceived difficulty in understanding mathematical concepts. According to Aguilar (2021), students with low motivation in mathematics often report anxious or discouraging learning experiences that affect their willingness to engage further with the subject.

Meanwhile, most indicators—including "I am confident that I could learn advanced mathematics" (WM = 2.85), "I plan to take as much mathematics as I can during my education" (WM = 3.01), and "The challenge of mathematics appeals to me" (WM = 3.22)—received Neutral descriptions. These responses indicate a balanced but uncertain level of motivation, where students recognize the value of mathematics but may still be hesitant about committing deeper effort. Hettinger et al. (2023) found that students' math motivation is strongly influenced by classroom climate and instructional support; when learners feel encouraged and supported, they show greater willingness to persist in mathematical tasks.

Items showing neutrality also highlight that respondents do not reject the idea of pursuing more advanced mathematics, but they are not strongly compelled either. This middle-ground perspective often reflects students' fluctuating confidence and varying levels of self-efficacy. In the study of Roche et al. (2021), moderate motivation in mathematics is commonly observed when learners perceive the subject as important but also challenging, resulting in a cautious approach to further mathematical engagement.

In general, the results show that respondents hold a Neutral level of motivation toward mathematics. This means that while they are open to learning and can appreciate the challenge of the subject, they do not demonstrate strong enthusiasm toward taking more math courses or integrating mathematics deeply into their educational plans. As emphasized by Siregar (2025), strengthening students' motivation requires meaningful learning experiences, supportive feedback, and opportunities to succeed in challenging tasks, all of which help students develop greater persistence and interest in mathematics.

Table 12 - Summary on the level of respondents Attitudes towards Mathematics

Components	WM	SD	Verbal Description
Self-confidence	2.80	1.13	Neutral
Value of Math	4.04	0.95	Positive
Enjoyment in Math	2.98	1.06	Neutral
Motivation in Math	2.77	0.98	Neutral
Grand Mean	**3.15**		**Neutral**
Grand Standard Deviation		**1.03**	

Table 12 presented the summary of respondents' attitudes towards Mathematics across four components—self-confidence, value of math, enjoyment in math, and motivation in math. The table reveals a Grand Mean of 3.15, which corresponds to a Neutral verbal description. This indicates that overall, the respondents exhibit a balanced but moderate attitude toward mathematics, showing neither strong negativity nor strong positivity, except in their valuation of the subject.

The findings show that Value of Math obtained the highest weighted mean (WM = 4.04, Positive). This indicates that respondents clearly recognize the importance and usefulness of mathematics in education, daily life, and future careers. According to Hill et al. (2023), students who value mathematics

tend to see its relevance beyond the classroom, contributing to stronger appreciation and long-term engagement with the subject.

Meanwhile, the components of Self-confidence (WM = 2.80), Enjoyment in Math (WM = 2.98), and Motivation in Math (WM = 2.77) all yielded Neutral descriptions. These results suggest that respondents hold moderate beliefs about their abilities, experience a fair amount of enjoyment, and possess an average level of motivation when dealing with mathematical tasks. Neutral attitudes reflect inconsistencies in experiences—where students may feel confident or motivated in some mathematics topics but not in others. In a study by Augilar (2021), students' mixed experiences in mathematics often lead to fluctuating confidence and motivation, particularly when they encounter varying levels of difficulty across topics.

The neutral ratings for enjoyment and motivation also imply that while students do not strongly dislike mathematics, they are not fully enthusiastic about pursuing it either. Liu et al. (2022) highlighted that students with moderate enjoyment tend to participate more when learning environments are supportive and tasks are meaningful. Likewise, Morano et al. (2021). found that moderate motivation is typical among learners who perceive mathematics as valuable but challenging, resulting in cautious engagement rather than strong proactive involvement.

Overall, the Grand Mean of 3.15 indicates a generally Neutral attitude toward mathematics. This means that although students recognize the importance of mathematics, they do not consistently feel confident, motivated, or highly joyful when engaging with mathematical tasks. As emphasized by Sujatha and Vinayakan (2023), strengthening positive attitudes in mathematics requires instructional practices that foster success experiences, provide supportive feedback, and connect mathematical ideas to real-life applications.

LEVEL OF PROBLEM SOLVING CONFIDENCE OF THE RESPONDENTS

Problem-solving confidence indicates students' perceived ability to analyze and solve mathematical problems. Understanding this variable is crucial in interpreting students' numeracy performance. Data gathered are presented in Table 13 below.

Table 13 - Level of problem-solving confidence of the respondents

S/N	Indicators	WM	SD	Verbal Description
1	I like to solve to a problem	3.10	1.06	Moderate
2	I enjoy solving a problem	3.10	1.07	Moderate
3	I like to solve a numeric problem	2.96	1.01	Moderate
4	I do my best to be successful in problem solving	3.90	0.87	High
5	I am interested in problem solving	3.28	0.98	Moderate
6	I like to struggle with solving problem even if I cannot solve the problem	3.14	1.16	Moderate
7	I like to solve problems from different sources	3.00	1.01	Moderate
8	I struggle with a problem until I find the correct answer	3.70	0.86	High
9	I try too hard when I cannot solve the problem	3.60	1.06	High
10	I am sure that I can solve a problem	2.84	1.13	Moderate
11	I am self confident in problem solving	2.81	1.08	Moderate
12	I am sure that I am able to solve even a difficult problem	2.57	1.12	Low
13	I do my best for solving the problem no matter how difficult a problem	3.79	0.88	High
14	I lose track of time while solving a problem	3.58	1.14	High
15	I demoralize if I cannot solve a problem	2.97	1.03	Moderate
16	I am stressed while solving a problem	3.38	1.09	Moderate
17	I lose self-confidence if I cannot solve a problem	3.35	1.40	Moderate
18	I am upset when I find incorrect answer of a problem	3.42	1.26	High
19	I am afraid of making numerical mistakes	3.67	1.09	High
20	Preconceptions prevent me from solving a problem	2.92	0.85	Moderate
	Aggregate Mean	**3.25**		**Moderate**
	Aggregate Standard Deviation		**1.06**	

Legend: 4.21-5.00-Very High; 3.41-4.20- High; 2.61-3.40-Moderate; 1.81-2.60-Low; 1.00-1.80- Very Low

Table 13 showed the level of problem-solving confidence of the respondents. The table reveals an aggregate mean of 3.25, which corresponds to a Moderate verbal description. This indicates that respondents generally possess a fair level of confidence in solving mathematical problems, though not at a consistently high level. Their responses suggest that while they demonstrate persistence and interest in problem solving, they also experience uncertainty, stress, and occasional loss of self-confidence.

Several indicators obtained High verbal descriptions, particularly items related to perseverance and emotional investment in problem solving. For instance, respondents highly agreed that they do their best to be successful in problem solving (WM = 3.90), struggle with a problem until they find the correct answer (WM = 3.70), and try very hard when they cannot solve a problem (WM = 3.60). These findings illustrate students' determination and resilience when faced with challenging tasks. According to DiNapoli and Miller (2022), students who show strong perseverance in problem solving are more likely to develop adaptive learning behaviors, enabling them to approach tasks with greater persistence and belief in improvement.

Additionally, respondents rated highly their emotional reactions toward errors, such as being upset when thcsey find incorrect answers (WM = 3.42) and being afraid of making numerical mistakes (WM = 3.67). These high ratings suggest that while students are committed to solving problems correctly, they may also experience performance pressure. Hoth et al. (2022) found that fear of making mistakes is common among math learners and can influence their confidence, especially when they value accuracy and correctness.

The majority of items, however, received Moderate ratings. These include statements such as liking to solve numeric problems, being sure they can solve a problem, being self-confident in problem solving, and experiencing stress while solving problems. Moderate responses indicate that students possess a balanced level of problem-solving confidence—sufficient to engage with mathematical tasks but not consistently strong across all problem types. Wang and Molnár (2023). explain that moderate problem-solving confidence typically emerges when students have mixed experiences, alternating between success and difficulty depending on problem complexity and prior knowledge.

One item received a Low verbal description: "I am sure that I am able to solve even a difficult problem" (WM = 2.57). This suggests that respondents may struggle with confidence when faced with more complex mathematical challenges. This aligns with the findings of Monarrez and Tchoshanov (2024), who reported that students often show lower confidence for high-cognitive-demand tasks, especially when they lack familiarity or feel pressured to perform well.

In general, the results show that respondents have a Moderate level of problem-solving confidence. This means that while they demonstrate persistence, determination, and interest in solving mathematical problems, they also encounter challenges related to stress, fear of mistakes, and reduced confidence when dealing with more difficult problems. As emphasized by Siregar (2025), strengthening problem-solving confidence requires supportive learning environments, opportunities for guided struggle, and instructional strategies that build students' belief in their ability to succeed even when tasks are complex.

LEVEL OF NUMERACY SKILLS OF THE RESPONDENTS

Numeracy skills measure students' competence in performing essential mathematical tasks. This variable is central to the study's objectives and helps identify learners' proficiency levels. Data gathered are presented in Table 14 below.

Table 14 - Level of numeracy skills of the respondents

Level	Numerical Range	f	%
Advanced	33–40	3	3.00
Proficient	25–32	11	11.00
Basic	17–24	48	48.00
Developing	9–16	35	35.00
Beginning	0–8	3	3.00
Total		**100**	**100.00**
Mean		18.45	
St. Dev.		5.67	

Table 14 showed the level of numeracy skills of the respondents. The results indicate that the majority of learners (48%) fall within the Basic level, demonstrating foundational numeracy skills but still requiring support to perform more complex mathematical operations. Numeracy skills are essential for applying mathematical concepts in everyday life and academic tasks, as they involve understanding, interpreting, and manipulating numbers effectively. According to Aniati et al. (2022), students with basic numeracy skills often face challenges in problem solving and higher-order mathematical reasoning, which may limit their capacity to perform confidently in more advanced topics.

A significant portion of the respondents, 35%, are classified under the Developing level, suggesting that they are still acquiring essential skills needed for competence in mathematics. Only a small proportion of respondents achieved higher performance levels: 11% are Proficient, and 3% are Advanced, reflecting that a limited number of learners can confidently perform complex calculations and problem-solving tasks. Sujatha and Vinayakan (2023) emphasize that students with advanced numeracy skills are better equipped to handle academic challenges and real-life quantitative reasoning, highlighting the importance of strengthening foundational skills for all learners.

Conversely, 3% of respondents belong to the Beginning level, indicating minimal numeracy competency and a need for focused intervention. Early identification and remediation are critical in preventing further difficulties in mathematics, as noted by Bryant et al. (2019), who found that targeted numeracy support significantly improves learners' performance and confidence in mathematics.

The mean score of 18.45, which falls within the Basic range, coupled with a standard deviation of 5.67, indicates that while most students perform at a foundational level, there is considerable variability in numeracy skills among the respondents. This suggests that instructional strategies should be differentiated to cater to varying levels of ability, ensuring that both struggling and high-performing learners are adequately supported.

In general, the results reveal that respondents exhibit a Basic level of numeracy skills overall. This implies a need for interventions, such as guided practice, problem-solving activities, and scaffolded instruction, to strengthen learners' numerical competencies. As emphasized by Chen (2025), enhancing numeracy skills in early education promotes academic achievement, confidence in mathematics, and the ability to apply mathematical reasoning in real-life contexts.

RELATIONSHIP BETWEEN ATTITUDE TOWARDS MATHEMATICS AND NUMERACY SKILLS OF THE RESPONDENTS

This section presents the relationship between the respondents' attitude towards Mathematics and their numeracy skills which is presented in table 15.

Table 15 - Test of relationship between the respondents' attitudes towards Mathematics and their numeracy skills

Variables	Spearman's rho	Strength of Correlation	p - value	Decision	Result
Attitudes and Numeracy Skills	0.168	Negligible Positive	0.094	Do not reject Ho	Not Significant

*significant at p<0.05 (two-tailed)

Table 15 showed the test of relationship between the respondents' attitudes towards Mathematics and their numeracy skills. The results indicate a Spearman's rho of 0.168, which reflects a negligible positive correlation between attitudes and numeracy skills. This suggests that while more positive attitudes toward mathematics are slightly associated with higher numeracy skills, the relationship is very weak and practically minimal. The p-value of 0.094 exceeds the significance threshold of 0.05, leading to the decision to not reject the null hypothesis. This means that the observed correlation is not statistically significant, and the data do not provide enough evidence to conclude a meaningful relationship between respondents' attitudes and their numeracy performance.

The negligible positive correlation may be attributed to the fact that although learners recognize the value of mathematics and hold generally neutral attitudes toward enjoyment, confidence, and motivation, these attitudes do not automatically translate into measurable numeracy skills. According to Rehman (2025), while positive attitudes can influence engagement in learning, actual proficiency in numeracy also depends heavily on prior knowledge, instructional quality, and practice opportunities. Similarly, Wen et al. (2022) emphasized that students may value mathematics and

display interest, but without consistent application and skill development, attitudes alone have limited impact on numerical performance.

In general, the results imply that respondents' attitudes toward mathematics are not significantly related to their numeracy skills. This indicates that fostering positive attitudes alone may not be sufficient to improve numeracy; targeted instruction, guided practice, and skill-building exercises are also essential to enhance students' mathematical competence. As noted by Susanti (2025), effective numeracy development requires a combination of positive learner disposition, deliberate practice, and contextualized problem-solving activities to achieve measurable improvement.

RELATIONSHIP BETWEEN PROBLEM SOLVING CONFIDENCE AND NUMERACY SKILLS OF THE RESPONDENTS

This section presents the relationship between the respondents' problem-solving confidence and their numeracy skills, which is presented in Table 16.

Table 16 - Test of the relationship between the respondents' problem-solving confidence and their numeracy skills

Variables	Spearman's rho	Strength of Correlation	p - value	Decision	Result
Problem Solving and Numeracy Skills	0.202*	Negligible Positive	0.044	Reject Ho	Significant

*significant at p<0.05 (two-tailed)

Table 16 showed the test of the relationship between the respondents' problem-solving confidence and their numeracy skills. The results indicate a Spearman's rho of 0.202, reflecting a negligible positive correlation between problem-solving confidence and numeracy skills. Despite being categorized as negligible, the correlation is statistically significant with a p-value of 0.044, which is less than the 0.05 threshold, leading to the decision to reject the null hypothesis. This suggests that respondents' confidence in problem-solving is positively associated with their numeracy performance, albeit weakly.

The positive relationship implies that learners who demonstrate higher problem-solving confidence are more likely to perform better in numeracy tasks. Confidence in problem-solving enables students to approach mathematical problems with persistence, strategic thinking, and reduced anxiety, which can enhance performance. According to Torres‑Peña (2025), students with strong problem-solving confidence are more likely to engage deeply in numerical reasoning and apply strategies effectively, thereby improving their numeracy outcomes. Similarly, Siregar (2025) emphasized that confidence in problem-solving acts as a motivational and cognitive resource that supports learners' ability to handle complex mathematical tasks.

In general, the results suggest that problem-solving confidence has a significant, albeit small, positive effect on numeracy skills. This finding highlights the importance of fostering problem-solving confidence in learners, as even slight increases in confidence can contribute to better numerical performance. As noted by Clemente et al. (2024), interventions that build students' self-efficacy in problem solving—such as scaffolded tasks, guided practice, and constructive feedback—can enhance both confidence and competence in numeracy.

Chapter 3
SUMMARY, FINDINGS, CONCLUSION, AND RECOMMENDATION

This chapter presented the summary, findings, conclusion, and recommendations of the study. It aimed to provide a coherent overview of the respondents' attitudes toward mathematics, problem-solving confidence, numeracy skills, and the relationships among these variables, as a basis for a proposed intervention plan to improve mathematical performance.

SUMMARY

This study aimed to determine the attitudes and performance of students in mathematics, focusing on their self-confidence, perceived value of math, enjoyment, motivation, problem-solving confidence, and numeracy skills. The respondents' profiles, including parents' educational attainment and monthly income, were considered to provide context for interpreting the results. Data were gathered using a structured questionnaire designed to measure students' attitudes toward mathematics and their level of problem-solving confidence, alongside a standardized numeracy test to evaluate their mathematical skills. The study employed descriptive statistical tools such as frequency counts, percentages, weighted means, and standard deviations to summarize and describe the respondents' profiles and

levels of attitudes, confidence, and numeracy skills. To determine the relationships among students' attitudes toward mathematics, problem-solving confidence, and numeracy skills, Spearman's rho correlation analysis was utilized.

The findings generated from these analyses served as the basis for interpreting the extent to which affective factors relate to students' mathematical performance and for formulating recommendations and an enhancement plan aimed at improving numeracy skills and problem-solving confidence among learners.

FINDINGS

The following findings were arrived based on the results of the data that were gathered and treated statistically.

Findings showed Majority of the respondents are male repeaters who are aging from fourteen to fifteen years old of Grade 9. Analysis of the respondents' profiles revealed that most respondents' fathers attained a college level of education, while most mothers achieved college graduation. A majority of families have a moderate monthly income. These findings suggest that while educational attainment and family income may provide some support for learning, they do not guarantee high mathematical performance.

In terms of attitudes toward mathematics, respondents showed a Neutral level of self-confidence, indicating moderate belief in their mathematical abilities. However, they recognized the importance of mathematics in daily life and education, with a Positive rating in the value of math. Enjoyment of mathematics and motivation to engage in mathematical tasks were both Neutral, reflecting moderate interest and willingness to participate in learning activities. Overall, the respondents hold a Neutral attitude toward mathematics, appreciating its relevance but not consistently demonstrating confidence, enjoyment, or motivation.

Regarding problem-solving confidence, respondents generally displayed a Moderate level. Items assessing perseverance, such as struggling until finding the correct answer and doing their best in solving problems, received High ratings, demonstrating resilience and persistence in mathematical tasks. Conversely, items related to confidence in solving difficult problems scored lower, suggesting that respondents may experience uncertainty or stress in more challenging scenarios.

Chapter 4
OUTPUT OF THE STUDY

This chapter presented the numerical skills enhancement plan which aims to enhance the problem-solving confidence, attitudes, and numeracy skills of students in mathematics.

Assessment of numeracy skills revealed that the majority of respondents are at the Basic level, followed by Developing, with only a small fraction achieving Proficient or Advanced levels. The mean score indicates foundational mathematical abilities, with a standard deviation reflecting variability in performance. These results suggest that many students require additional support to develop higher-level numeracy skills.

The relationship tests showed that respondents' attitudes toward mathematics and numeracy skills are not significantly correlated, indicating that positive attitudes alone do not guarantee higher numeracy performance. In contrast, problem-solving confidence and numeracy skills demonstrated a negligible but significant positive correlation, suggesting that students who exhibit higher confidence in solving problems tend to perform slightly better in numeracy tasks.

CONCLUSION

Based on the findings, it can be concluded that respondents generally hold a Neutral attitude toward mathematics, with recognition of its value but moderate confidence, enjoyment, and motivation. Their problem-solving confidence is moderate, with strong persistence in manageable tasks but lower assurance when facing difficult problems. Numeracy skills are largely at the Basic level, indicating a need for additional instructional support. While attitudes toward mathematics do not significantly influence numeracy performance, problem-solving confidence shows a small positive effect, highlighting the importance of fostering self-efficacy and persistence in learning. Overall, the study suggests that factors such as skill development, confidence building, and instructional support are critical in enhancing mathematical performance.

RECOMMENDATION

Drawn from the study's findings and conclusion, it is highly recommended that the numerical skills enhancement plan to enhance the attitudes, problem-solving confidence, and numeracy skills of the respondents in mathematics be adopted. The plan should include activities and strategies that foster student-centered learning, build confidence in problem solving, and strengthen foundational numeracy skills to improve overall mathematical performance.

Rationale

The role of the teacher in the classroom extends beyond identifying high-performing students; it also includes recognizing and supporting learners who struggle during the learning process. Oftentimes, students with lower performance are left behind due to the limited time allocated for lessons. This practice

can hinder learning, especially for students who find mathematics challenging. Mathematics is frequently considered a difficult subject because it requires the application of cumulative concepts and problem-solving strategies. The nature of the subject, which often relies on scaffolding, necessitates that students master foundational concepts before moving on to more complex topics. Failure to ensure a strong foundation may result in poor performance, and in some cases, student retention if learning deficits persist into subsequent grading periods.

The findings of this study indicate that while students recognize the value of mathematics and demonstrate moderate problem-solving confidence, most possess basic numeracy skills and hold neutral attitudes toward self-confidence, enjoyment, and motivation. These results highlight the need for an intervention that strengthens numeracy competence, problem-solving confidence, and positive engagement with mathematics. Addressing these areas is essential to reduce academic struggles, foster mathematical skills, and ultimately minimize student retention, which has remained a persistent issue in schools when learners fail to meet DepEd standards.

The numerical skills enhancement plan is designed to provide structured, student-centered activities that improve problem-solving confidence, enhance attitudes toward mathematics, and strengthen numeracy skills. Activities will focus on guided problem-solving, scaffolded practice, real-life applications, and collaborative learning, allowing students to actively engage in tasks while receiving continuous support and feedback. The intervention will also include exercises aimed at building self-confidence, helping students tackle challenging problems without fear of failure, and recognizing the importance of mathematics in daily life.

Objectives

The Numerical Skills Enhancement Plan is designed to achieve the following objectives:

1. Increased students' performance in Mathematics, particularly in numeracy skills
2. A student-centered classroom environment that fosters participation, engagement, and collaboration.
3. Improved attitudes toward mathematics, including enjoyment, confidence, and motivation.
4. Enhanced self-confidence in approaching and solving math-related activities.
5. Development of a sense of the importance of mathematics in real-life situations, reinforcing the practical value of the subject.

Scheme of the Implementation

To ensure that this enhancement plan is properly implemented, it will first be presented to the principal, guidance coordinators, and mathematics teachers of the school. Teachers will receive copies of the proposed activities, instructional matrices, and guidelines for implementation.

The plan will be executed in the classroom through structured, scaffolded lessons and collaborative problem-solving activities, ensuring that students at the basic and developing levels receive additional support. Teachers will provide continuous feedback, monitor student progress, and adapt tasks to address learners' specific needs.

Finally, the effectiveness of the enhancement plan will be evaluated based on improvements in numeracy skills, problem-solving confidence, and attitudes toward mathematics, allowing adjustments to the plan for maximum impact. Through this intervention, students are expected to gain confidence, strengthen their mathematical skills, and engage more actively in learning, thereby reducing difficulties in mathematics and improving overall performance.

Table 17 - Enhancement Plan: Fostering Positive Attitudes, Problem-Solving Confidence, and Numeracy Skills in Grade 9 Learners

Component	Objective	Strategy	Responsible	Budget	Source of Budget	Time Frame	Expected Outcome	Actual Accomplishment	Remarks
Attitude Enhancement	Improve students' attitudes toward	Workshops on math appreciation sessions	Math Teachers, Guidance Counselors	₱8,000	School Funds	1st Quarter SY 2026–27	Increased positive attitudes toward math		

	mathematics								
Problem-Solving Confidence	Build confidence in solving mathematical problems	Guided problem-solving sessions, real-life math applications	Math Teachers, Grade Level Heads	₱10,000	School Funds	Monthly Sessions	Students demonstrate higher confidence in tackling problems		
Numeracy Skills Development	Strengthen foundational numeracy skills	Diagnostic tests, targeted practice exercises.	Math Teachers, Learning Support Staff	₱12,000	School Funds	Every Mid-Quarter	Improvement in numeracy test scores		
Engagement & Motivation	Increase student participation and enjoyment in math	Math games, interactive lessons, , project-based learning	Math Teachers, ICT Staff	₱6,000	School Improvement Fund	Monthly	Students actively participate and show enthusiasm in math activities		
Feedback & Assessment	Monitor progress and provide support	Continuous assessment, reflection journals, teacher feedback	Math Teachers, Grade Level Coordinators	₱4,000	School Funds	End of Each Term	Data-driven adjustments to learning strategies		
Parent & Community Involvement	Strengthen home-school support	Parent-teacher conferences, progress updates	Homeroom Teachers, Guidance Office	₱5,000	PTA	Ongoing	Improved parent engagement and continuity of support		
Resource Development	Provide accessible instructional materials	Development of visual aids, ICT-based resources	Math Teachers, ICT Staff	₱7,000	School Improvement Fund	Monthly	Availability of learner-friendly math materials		

ACKNOWLEDGMENT

First, I would like to give thanks and praise to the Almighty God for providing me with wisdom and knowledge in this milestone. Second, my deepest and sincerest gratitude to all the people who helped me, in any manner by sharing their effort, knowledge, guidance, support, inspiration, and encouragement to make this research a success, namely:

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Rose Gamboa

DEDICATION

This research is dedicated to my family for the never-ending inspiration.

To my parents, though you may not have supported me financially, your love, presence, and unwavering support have inspired me to strive harder. This dream is not only mine but also yours. Despite all the hardships and struggles we have faced, I continue to pursue my goals because of you. You are my greatest inspiration to dream beyond what I thought was possible.

To my working besties—Daddy, Ate Ching, and Thalia—thank you for helping me with my data gathering. Everything went smoothly and easily because of your support.

To all my friends, for always believing in me; thank you for walking beside me, for the cheers, and your mere existence to support me in many little ways you never know of. Thank you,

To my research adviser, thank you for your patience, encouragement, and constant guidance. Your support has shaped this research into what it is today.

To my mentors, whose guidance and wisdom have inspired me to reach higher-this work is a reflection of your influence.

Above all, to the Almighty Father, thanks to you for the enlightenments, through all my prayers and granting me the strength, wisdom and grace to complete this thesis, this achievement is for Your glory.

Rose S. Gamboa

APPENDICES

Appendix A
TRANSMITTAL LETTER

Dear Parent/s:

To God be the Glory!

Your child is invited to participate in a thesis entitled **"UNDERSTANDING STUDENTS' NUMERACY COMPETENCE THROUGH THE LENS OF CONFIDENCE IN PROBLEM SOLVING AND ATTITUDE TOWARDS MATHEMATICS".**

The purpose of this letter is to provide you as the parent of a prospective thesis participant with information that may influence your decision to allow your child to participate in this thesis. The researchers will explain the study to you and answer all your questions. Before deciding whether or not to give your child permission to participate, read the information below and ask any questions you may have. This form will be used to record your permission if you decide to allow your child to participate in this study.

Purpose of the Study

If you agree, your child will be asked to participate in a research study about **"UNDERSTANDING STUDENTS' NUMERACY COMPETENCE THROUGH THE LENS OF CONFIDENCE IN PROBLEM SOLVING AND ATTITUDE TOWARDS MATHEMATICS".** The purpose of this study is to check if the learner's learning style is a potential tool for the improvement of students' Numeracy Skills.

What is my child going to be asked to do?

If you allow your child to participate in this study, they will be asked to answer the questionnaire on their problem solving confidence, attitude towards mathematics, and answer the 1 to 40 item achievement tests after their math teacher discusses about certain topics. The target participants are the ninth-grade students at this school.

What are the risks involved in this study?

There are no foreseeable risks to participating in this study.

What are the possible benefits of this study?

The possible benefits of this study are your child's knowledge of his confidence in problem solving to improve his academic performance in mathematics.

Does my child have to participate?

This research study will take place during regular classroom activities; however, if you do not want your child to participate, it will not affect their relationship of the school.

What if my child does not want to participate?

Your child must agree to participate in the study in addition to your permission. If your child declines to participate, he or she will not be included in the study and will face no consequences. If your child initially agrees to participate in the study, they can change their mind at any time without penalty.

Will there be any compensation?

Neither you nor your child will receive any type of payment participating in this study.

How will your child's privacy and confidentiality be protected if s/he participates in this research study?

The data collected as a result of your child's participation may be shared with other researchers in the future for research purposes not specified in this consent form. In these cases, the data will be free of any identifying information that could be linked to your child or his or her participation in any study.

Whom to contact with questions about the study?

You can contact your child's Math teacher if you have questions about this study.

Whom to contact with questions concerning your rights as a research participant?

For questions about your rights or any dissatisfaction with any part of this study, you can contact the researchers by phone number 09499619004.

You are about to make a decision about whether or not to allow your child to participate in this study. By signing below, you acknowledge that you have read the information above and have decided to allow them to participate in the study. If you later decide that you wish to withdraw your child's permission to participate in the study, you may do so at any time. This document will be provided to you in its entirety

CONCHITA A. ARCHIVAL

Parent's Signature Over Printed Namo

Thank you very much, God bless and more power! Respectfully yours,

Researcher

Appendix B
PARENTAL CONSENT FOR CHILDREN PARTICIPATION

MRS. EPIFANIA M. REYES
BED Principal
St. Cecilia's College - Cebu, Inc.
Cebu South National Highway,
Ward II, Minglanilla, Cebu

Dear Madam:

I am a graduate student of Cebu Technological University- Main Campus taking up Master of Arts in Education major in Mathematics. I am currently working on my thesis entitled **"UNDERSTANDING STUDENTS' NUMERACY COMPETENCE THROUGH THE LENS OF CONFIDENCE IN PROBLEM SOLVING AND ATTITUDE TOWARDS MATHEMATICS"** as one of the requirements of my course.

In line with this, I would like to ask permission from your good office to allow me to conduct data collection and administer the questionnaires to the Grade 9 students of your institution. Rest assured that the data collected in the research will be treated with utmost confidentiality and will only be used for the said purpose.

I am hoping for a favorable response on this matter.

Thank you and God Bless.

Sincerely yours,

ROSE S. GAMBOA
Researcher

Noted:

EMERSON D. PETEROS, Dev.Ed.D.
Adviser

Approved by:

MRS. EPIFANIA REYES
BED Principal

Appendix C
QUESTIONNAIRE FOR THE RESPONDENTS

Part I. Profile of the Respondents

Name:_____Age:_____Gender: _____M____F

Directions: Put a checkmark (/) on your appropriate answer based on your profile.

Parents' Highest Educational Attainment:

Father	**Mother**
_____Doctorate Graduate	_____ Doctorate Graduate
_____With Doctorate Units	_____ With Doctorate Units
_____Master's Graduate	_____ Master's Graduate
_____With Master's Units	_____ With Master's Units
_____College Graduate	_____ College Graduate
_____College Level	_____ College Level
_____High School Graduate	_____ High School Graduate
_____High School Level	_____ High School Level
_____Elementary Graduate	_____ Elementary Graduate
_____Elementary Level	_____ Elementary Level
_____No Formal Education	_____ No Formal Education

Combined Family Monthly Income:

_____less than ₱10,957
_____between ₱10,957 - ₱21,914
_____between ₱21,915 - ₱43,828
_____between ₱43,829 - ₱76,699
_____₱76,700 and above

Part II. Students' Attitudes Towards Mathematics

Directions: Read each statement carefully. Indicate how much you agree with each statement using the scale below.

1 – Strongly Disagree
2 – Disagree
3 – Neutral
4 – Agree
5 – Strongly Agree

A. Students' Attitudes Towards Mathematics as to Self-Confidence					
1. Mathematics is a standout amongst my most feared subjects.					
2. My mind goes blank, and I am unable to think clearly when working with math.					
3. Studying mathematics makes me feel nervous.					
4. Mathematics makes me feel uncomfortable.					

5.	I am constantly under an awful strain in a math class.					
6.	When I hear the word mathematics, I feel uneasy.					
7.	It makes me nervous to even think about completing a math problem.					
8.	Mathematics does not scare me at all.					
9.	I expect to do well in any math class I take.					
10.	I am constantly confused in my math class.					
11.	I have a lot of self-confidence when it comes to mathematics.					
12.	I am able to solve math problems without much difficulty.					
13.	I feel insecure when trying to do mathematics.					
14.	I learn mathematics easily.					
15.	I believe that I am good at solving math problems.					
B. Students' Attitudes Towards Mathematics as to Value of Math						
1.	Mathematics is an essential and necessary subject.					
2.	I want to develop my mathematical skills.					
3.	Mathematics helps develop the mind and teaches us to think.					
4.	Mathematics is essential in everyday life.					
5.	Mathematics is one of the most important subjects for people to study.					
6.	High school math courses would be useful regardless of my career path.					
7.	I can think of many ways that I use math outside of school.					
8.	Studying advanced mathematics is useful.					
9.	Studying math helps me with problem-solving in other areas.					
10.	A solid math foundation could help me in my professional life.					
C. Students' Attitudes Towards Mathematics as to Enjoyment in Math						
1.	I get much satisfaction out of solving a math problem.					
2.	I have generally enjoyed studying math in school.					
3.	Mathematics is dull and boring.					
4.	I like to tackle new problems in mathematics.					
5.	I would rather complete a task in math than write an essay.					
6.	I like mathematics.					
7.	I am happier in a mathematics class than in any other class.					
8.	Mathematics is an interesting subject.					
9.	I am comfortable expressing my own ideas on how to solve a difficult math problem.					
10.	I am comfortable answering questions in math.					
D. Students' Attitudes Towards Mathematics as to Motivation in Math						
1.	I am confident that I could learn advanced mathematics.					
2.	I would like to avoid using mathematics in school.					
3.	I will take more than the required number of mathematics subjects.					
4.	I plan to take as much mathematics as I can during my education.					
5.	The challenge of mathematics appeals to me.					

Part III. Problem-Solving Confidence

Directions: Read each statement carefully. Indicate how much you agree with each statement using the scale below.

1 – Strongly Disagree
2 – Disagree
3 – Neutral
4 – Agree
5 – Strongly Agree

Problem-Solving Confidence	1	2	3	4	5
1. I like to solve to a problem					
2. I enjoy solving a problem					
3. I like to solve a numeric problem					
4. I do my best to be successful in problem solving					
5. I am interested in problem solving					

6. I like to struggle with solving problem even if I cannot solve the problem					
7. I like to solve problems from different sources					
8. I struggle with a problem until I find the correct answer					
9. I try too hard when I cannot solve the problem					
10. I am sure that I can solve a problem					
11. I am self confident in problem solving					
12. I am sure that I am able to solve even a difficult problem					
13. I do my best for solving the problem no matter how difficult a problem					
14. I lose track of time while solving a problem					
15. I demoralize if I cannot solve a problem					
16. I am stressed while solving a problem					
17. I lose self-confidence if I cannot solve a problem					
18. I am upset when I find incorrect answer of a problem					
19. I am afraid of making numerical mistakes					
20. Preconceptions prevent me from solving a problem					

Part IV: Numeracy Test

Quarter: _____Time: 60 minutes Total Items: 40

General Directions: Read each item carefully. Choose the letter of the correct answer and write it on your answer sheet. Avoid erasures.

1. What is the product of $5x(x + 7)$?
   A. $5x + 35$ B. $5x^2 + 7$ C. $5x^2 + 35x$ D. $x^2 + 35$

2. Simplify $(x + 3)(x + 2)$.
   A. $x^2 + 5x + 6$ B. $x^2 + 6x + 5$ C. $x^2 + 5x + 2$ D. $x^2 + 4x + 3$

3. Find $(x - 4)^2$.
   A. $x^2 + 8x + 16$ B. $x^2 - 8x + 16$ C. $x^2 - 16x + 4$ D. $x^2 + 16$

4. Simplify $(t + 2)^2$.
   A. $t^2 + 4t + 4$ B. $t^2 + 2t + 2$ C. $t^2 + 4$ D. $t^2 + 2t + 4$

5. Multiply $(8 + r)(r - 5)$.
   A. $r^2 - 5r + 8$ B. $r^2 + 3r - 40$ C. $r^2 + 8r - 5$ D. $r^2 + 8r + 5$

6. Simplify $3(x + 4)$.
   A. $3x + 12$ B. $x + 12$ C. $12x + 3$ D. $3x + 4$

7. Find the value of x in $x + 8 = 15$.
   A. 7 B. 8 C. 9 D. 6

8. Evaluate $2(x + 3) - x$ when $x = 4$.
   A. 10 B. 8 C. 5 D. 2

9. Solve $3(x + 2) = 12$.
   A. 2 B. 3 C. 4 D. 5

10. Solve $-5 = 4 + x$.
    A. 1 B. -1 C. -9 D. 9

11. Find x if $7 - x = 2x - 14$.
    A. 3 B. 7 C. 9 D. 14

12. Solve $2x = 4 - 12$.
    A. 4 B. -4 C. 8 D. -8

13. Find the solution of $7(3x - 4) = 14$.
    A. $x = 10/3$ B. $x = 2$ C. $x = 4$ D. $x = 3$

14. Simplify $4(x - 2) + 8 = 0$.
    A. $x = 2$ B. $x = -2$ C. $x = 0$ D. $x = 4$

15. Solve the unknown value of $(2s - 1)^2 = 225$
    A. 8 B. 9 C. 10 D. 11

16. Solve the unknown value of $(k + 7)^2 = 289$
    A. 10 B. 14 C. -7 D. 17

17. Find the positive root of $x^2 = 16$
    A. 4 and -4 B. 8 C. 2 and -2 D. 16

18. Find the roots of the given equation, $3h^2 - 147 = 0$
A. ±7 B. ±9 C. ±10 D. ±14

19. Find the roots of the given equation, $2s^2 = 50$
A. ±4 B. ±5 C. ±6 D. ±7

20. Find the roots of the given equation, $x^2 + 9x + 8 = 0$
A. -1, -8 B. -8, -1 C. -8, -9 D. 8, 1

21. Find the positive root of $t^2 + 8t + 16 = 0$
A. -4 B. -8 C. 4 D. 8

22. Find the positive root of $4s^2 - 12s + 9 = 0$
A. 3/2 B. 3 C. 1 D. -3

23. Find the roots of the given equation, $x^2 - 5x - 14 = 0$
A. 7, -2 B. -7, 2 C. 5, 9 D. 2, -5

24. $x^2 - 10x + 25 = 0$
A. 10 B. 5 C. -5 D. -10

25. Find the roots of the given equation, $x^2 - 14 = 5$
A. 2, 7 B. 7, 2 C. 7, -2 D. -7, -2

26. Find the roots of the given equation, $2x^2 + 8x - 10 = 0$
A. -5, 1 B. 1, 5 C. -1, 5 D. -5, -1

27. Find the roots of the given equation, $s^2 + 4s - 21 = 0$
A. 3, -7 B. -3, 7 C. -7, -3 D. 7, 3

28. Find the roots of the given equation, $2x^2 + 3x = 27$
A. 3, -4.5 B. -3, 4.5 C. 9, -3 D. -9, 3

29. Find the roots of the given equation, $2x^2 + 7x + 9 = 0$
A. No real roots B. -1, -9 C. 1, -9 D. 9, -1

30. Find the roots of the given equation, $3x^2 - 12x + 12 = 0$
A. No real roots B. -2, -2 C. 2, -2 D. 2, 2

31. Transform $x(x + 5) = 2$ into standard quadratic form.
A. $x^2 + 5x - 2 = 0$ B. $x^2 + 5x + 2 = 0$
C. $x^2 - 5x - 2 = 0$ D. $x^2 + 2x + 5 = 0$

32. Expand $(s + 6)^2 = 5$.
A. $s^2 + 12s + 36 = 5$ B. $s^2 + 6s + 5 = 0$
C. $s^2 + 12s + 31 = 0$ D. $s^2 + 12s + 36 = 0$

33. $(2r + 3)^2 + (r + 4)^2 = 10$ simplifies to
A. $5r^2 + 20r + 25 = 0$ B. $5r^2 + 16r + 25 = 0$
C. $5r^2 + 12r + 25 = 0$ D. $5r^2 + 14r + 25 = 0$

34. $(m - 4)^2 + (m - 7)^2 = 15$
A. $2m^2 - 22m + 65 = 0$ B. $2m^2 - 18m + 50 = 0$
C. $2m^2 - 14m + 45 = 0$ D. $2m^2 - 22m - 65 = 0$

35. If y varies directly as x and $y = 24$ when $x = 6$, find the constant of variation.
A. 3 B. 4 C. 6 D. 2

36. If x varies directly as y and x = 35 when y = 7, find y when x = 25.
A. 3 B. 4 C. 5 D. 6

37. If y varies inversely as x and y = 5 when x = 2, find y when x = 4.
A. 10 B. 4 C. 2.5 D. 20

38. A rectangle's area is A = lw. If A = 48 and l = 8, find w.
A. 5 B. 6 C. 7 D. 8

39. The average of 5 numbers is 20. If one number is 10, what is the average of the remaining 4?
A. 18 B. 20 C. 22.5 D. 25

40. A number is increased by 8, then multiplied by 3. The result is 36. What is the number?
A. 2 B. 4 C. 6 D.8

Appendix D
Statistical Report

Profile of the respondents

age * gender Crosstabulation

Count

		gender		
		F	M	Total
age	14	39	30	69
	15	11	15	26
	16 and above	3	2	5
Total		53	47	100

father

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-DOCTORATE GRADUATE	2	2.0	2.0	2.0
	2-MASTER'S GRADUATE	4	4.0	4.0	6.0
	3-WITH MASTERS UNITS	2	2.0	2.0	8.0
	4-COLLEGE GRADUATE	58	58.0	58.0	66.0
	5-COLLEGE LEVEL	12	12.0	12.0	78.0
	6-HIGH SCHOOL GRADUATE	12	12.0	12.0	90.0
	7-HIGH SCHOOL LEVEL	7	7.0	7.0	97.0
	8-ELEMENTARY LEVEL	2	2.0	2.0	99.0
	9-NO FORMAL EDUCATION	1	1.0	1.0	100.0
	Total	100	100.0	100.0	

mother

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-DOCTORATE GRADUA	2	2.0	2.0	2.0
	1-WITH DOCTORATE U	1	1.0	1.0	3.0
	2-MASTER'S GRADUAT	1	1.0	1.0	4.0
	3-WITH MASTERS UNI	4	4.0	4.0	8.0
	4-COLLEGE GRADUATE	68	68.0	68.0	76.0

	5-COLLEGE LEVEL	9	9.0	9.0	85.0
	6-HIGH SCHOOL GRAD	14	14.0	14.0	99.0
	7-HIGH SCHOOL LEVE	1	1.0	1.0	100.0
	Total	100	100.0	100.0	

income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-76700 AND ABOVE	15	15.0	15.0	15.0
	2-BET 43829-76699	18	18.0	18.0	33.0
	3-BET 21915-43828	32	32.0	32.0	65.0
	4-BET 10957-21914	22	22.0	22.0	87.0
	5-LESS 10957	13	13.0	13.0	100.0
	Total	100	100.0	100.0	

Level of respondents attitudes towards Mathematics

Self-confidence

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
S1	100	1.00	5.00	3.3800	1.02277
S2	100	1.00	5.00	3.1000	1.05887
S3	100	1.00	5.00	2.7700	1.17082
S4	100	1.00	5.00	2.3600	1.11482
S5	100	1.00	5.00	2.7100	1.07586
S6	100	1.00	5.00	2.3100	1.18658
S7	100	1.00	5.00	2.7300	1.34731
S8	100	1.00	5.00	2.7200	1.10170
S9	100	1.00	5.00	3.0200	1.07290
S10	100	1.00	5.00	2.9600	1.09101
S11	100	1.00	5.00	2.6200	1.07101
S12	100	1.00	5.00	2.7300	1.21319
S13	100	1.00	5.00	3.0000	1.23091
S14	100	1.00	5.00	2.8200	1.04813
S15	100	1.00	5.00	2.7800	1.09710
Valid N (listwise)	100				

Value

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
V1	100	1.00	5.00	4.1200	1.07572
V2	100	2.00	5.00	4.5400	.80929
V3	100	2.00	5.00	4.1900	.82505
V4	100	1.00	5.00	3.8800	1.05677
V5	100	2.00	5.00	4.1000	.85870
V6	100	2.00	5.00	4.0100	.96917
V7	100	1.00	5.00	3.6100	1.09078
V8	100	1.00	5.00	4.0600	.97255
V9	100	2.00	5.00	3.9300	.91293
V10	100	1.00	5.00	4.0000	.93203
Valid N (listwise)	100				

Enjoyment

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation

E1	100	1.00	5.00	3.6000	1.23091
E2	100	1.00	5.00	3.1400	.96421
E3	100	1.00	4.00	2.1100	.88643
E4	100	1.00	5.00	2.8800	1.02770
E5	100	1.00	5.00	2.8000	1.44250
E6	100	1.00	5.00	3.1300	1.13400
E7	100	1.00	5.00	2.6800	1.08134
E8	100	2.00	5.00	3.8100	.91778
E9	100	1.00	5.00	2.7400	1.02119
E10	100	1.00	5.00	2.9200	.92856
Valid N (listwise)	100				

Motivation

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
M1	100	1.00	5.00	2.8500	1.15798
M2	100	1.00	5.00	2.2800	.99575
M3	100	1.00	5.00	2.5000	.84686
M4	100	1.00	5.00	3.0100	.96917
M5	100	1.00	5.00	3.2200	.93830
Valid N (listwise)	100				

Level of problem-solving confidence of the respondents

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
VAR00022	100	1.00	5.00	3.1000	1.05887
VAR00023	100	1.00	5.00	3.1000	1.06837
VAR00024	100	1.00	5.00	2.9600	1.01424
VAR00025	100	1.00	5.00	3.9000	.87039
VAR00026	100	1.00	5.00	3.2800	.97525
VAR00027	100	1.00	5.00	3.1400	1.16359
VAR00028	100	1.00	5.00	3.0000	1.00504
VAR00029	100	1.00	5.00	3.7000	.85870
VAR00030	100	1.00	5.00	3.6000	1.06363
VAR00031	100	1.00	5.00	2.8400	1.12564
VAR00032	100	1.00	5.00	2.8100	1.07961
VAR00033	100	1.00	5.00	2.5700	1.12146
VAR00034	100	2.00	5.00	3.7900	.87957
VAR00035	100	1.00	5.00	3.5800	1.13867
VAR00036	100	1.00	5.00	2.9700	1.02942
VAR00037	100	1.00	5.00	3.3800	1.08971
VAR00038	100	1.00	5.00	3.3500	1.39534
VAR00039	100	1.00	5.00	3.4200	1.26475
VAR00040	100	1.00	5.00	3.6700	1.09226
VAR00041	100	1.00	5.00	2.9200	.84900
Valid N (listwise)	100				

Level of numeracy skills of the respondents

VAR00043

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-33-40	3	3.0	3.0	3.0
	2-25-32	11	11.0	11.0	14.0
	3-17-24	48	48.0	48.0	62.0
	4-9-16	35	35.0	35.0	97.0
	5-0-8	3	3.0	3.0	100.0
	Total	100	100.0	100.0	

Test of Normality of the variables

Descriptives

	attitudes	problem solving	numeracy test scores
N	100	100	100
Missing	0	0	0
Mean	3.15	3.25	18.4
Median	3.14	3.25	18.0
Standard deviation	0.341	0.510	5.67
Minimum	2.20	1.65	6
Maximum	3.95	4.45	35
Shapiro-Wilk W	0.980	0.954	0.958
Shapiro-Wilk p	0.138	0.002	0.003

Test of the hypotheses

Correlation Matrix

		attitudes	problem solving	numeracy test scores
attitudes	**Spearman's rho**	—		
	df	—		
	p-value	—		
problem solving	**Spearman's rho**	0.609***	—	
	df	98	—	
	p-value	<.001	—	
numeracy test scores	**Spearman's rho**	0.168	0.202*	—
	df	98	98	—
	p-value	0.094	0.044	—

Note. * p < .05, ** p < .01, *** p < .001

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