



Mathematical Self-Efficacy and Performance of Grade 7 Learners Using the Rapid Mathematics Assessment (RMA)

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Abstract

Background and Aim: Mathematics is a foundational discipline that develops learners' critical thinking, logical reasoning, and problem-solving skills. However, many Filipino learners continue to experience difficulties in foundational mathematical competencies, as reflected in national and international assessment results. These learning gaps highlight the need for diagnostic assessments that can identify learners' strengths and weaknesses and inform instructional planning. This study aimed to examine the mathematical self-efficacy and mathematical performance of Grade 7 learners using the Rapid Mathematics Assessment (RMA). Specifically, it determined learners' levels of mathematical self-efficacy and mathematical performance, examined differences according to sex, and investigated the relationship between mathematical self-efficacy and posttest mathematical performance.

Materials and Methods: This study employed a quantitative descriptive-comparative-correlational design using a single-group pretest-posttest approach. The respondents consisted of 47 Grade 7 learners from Mayor Alfonso D. Tan High School, Tangub City, Philippines. Data were collected using the Department of Education's Rapid Mathematics Assessment (RMA), which underwent content review for its applicability to the study context, and an adapted Mathematics Self-Efficacy Questionnaire based on the Mathematics Self-Efficacy Scale (MSES). The adapted questionnaire likewise underwent expert content review and demonstrated excellent internal consistency reliability (Cronbach's $\alpha = .934$; McDonald's $\omega = .935$). Descriptive statistics were used to determine levels of mathematical self-efficacy and performance. Inferential statistics included the Wilcoxon Signed-Rank Test, Mann-Whitney U Test, and Spearman's rank-order correlation coefficient (ρ).

Results: Respondents demonstrated a moderately high level of mathematical self-efficacy. In terms of mathematical performance, most learners were initially classified at the Emerging proficiency level on the pretest but improved to the Developing and Proficient levels on the posttest. A statistically significant difference was found between pretest and posttest scores ($p < .001$), indicating higher mathematical performance at the end of the school year. Significant differences in pretest and posttest scores were likewise observed according to sex, with male respondents obtaining higher mean scores than female respondents. However, no significant difference in mathematical self-efficacy was found between male and female respondents ($p = .659$). Furthermore, no significant relationship was found between mathematical self-efficacy and posttest mathematical performance ($\rho = -0.058$, $p = .700$).

Conclusion: The findings suggest that mathematical self-efficacy alone may not sufficiently explain differences in foundational mathematical performance among the respondents. The study provides localized evidence on learners' mathematical self-efficacy, foundational mathematical performance, and the use of the Rapid Mathematics Assessment as a diagnostic tool for identifying learning gaps and monitoring learner progress. The findings may support assessment-informed instructional planning and intervention initiatives aligned with the goals of the MATATAG Agenda and related learning recovery programs in Philippine education.

Keywords: Self-efficacy, Mathematical Performance, Rapid Mathematics Assessment (RMA), Grade 7 Learners, Foundational Mathematical Competencies





Introduction

Mathematics is an integral part of basic education as it helps in the development of critical thinking, problem-solving, and decision-making abilities of the learners. Even though it is important, evidence still exists that Filipino learners still have difficulty reaching the expected level of mathematical proficiency. The Programme for International Student Assessment (PISA) 2022 results showed that the Philippines was among the lowest-scoring countries in math, and a significant percentage of students performed below the minimum level for functional mathematical literacy. These results illustrate the need for continuing areas for learning gaps in basic mathematical skills and highlight the importance of interventions that are effective in recognizing and correcting gaps in basic skills.

Beyond curriculum and assessment issues, research in education shows that psychological factors have an impact on students' performance through their engagement and learning patterns. Learners with ongoing problems in mathematics may experience negative self-efficacy in the ability to complete mathematical tasks, which can impact the motivation and persistence to learn mathematics. Due to the possibility of its connection with academic achievement, mathematical self-efficacy has gained much attention among these psychological factors. Past research has yielded mixed results on the relationship between mathematical self-efficacy and performance in mathematics; however, the need to continue investigation in various educational settings and student populations exists (Honicke & Broadbent, 2016).

Although there is an increasing amount of research in the field of mathematical achievement and mathematical self-efficacy, there are still limited studies that have investigated the mathematical performance, mathematical self-efficacy, and sex differences among learners in the Philippines using a diagnostic assessment of learners' foundational numeracy skills. Additionally, there is limited research on how Rapid Mathematics Assessment (RMA) is an instrument for studying foundational mathematics competencies of the Grade 7 learners. This gap relates especially to the need to improve foundations in the context of the MATATAG Curriculum, which is focused on improving foundations for future academic achievement.

This study, therefore, investigated the mathematical performance and mathematical self-efficacy of Grade 7 learners using the Rapid Mathematics Assessment (RMA). It specifically explored pretest and posttest performance of the learners, measured mathematical self-efficacy, compared the performance between sexes, and measured whether mathematical self-efficacy is significantly related to mathematical performance or not.

Objectives

This study examined the mathematical self-efficacy and mathematical performance of Grade 7 learners at Mayor Alfonso D. Tan High School using the Rapid Mathematics Assessment (RMA). Specifically, it aimed to:

1. Describe the mathematical self-efficacy and mathematical performance profiles of the respondents according to sex.
2. Determine the level of mathematical self-efficacy of the respondents in terms of: a. Confidence in Solving Mathematical Problems (CSMP); b. Confidence in Learning Mathematics (CLM); and c. Confidence in Performing Mathematical Tasks (CPMT).
3. Determine the level of mathematical performance of the respondents based on their RMA pretest and posttest scores.
4. Determine whether a significant difference exists between the pretest and posttest scores of the respondents.
5. Determine whether significant differences exist in mathematical self-efficacy, pretest scores, and posttest scores when respondents are grouped according to sex.
6. Determine whether a significant relationship exists between mathematical self-efficacy and posttest mathematical performance.





Literature review

Several studies have shown that mathematical self-efficacy is closely related to academic achievement. Pajares and Miller (1994) explained that students who believe in their math abilities are more likely to perform well in mathematics because they demonstrate stronger persistence and motivation. Recent studies also support this finding. Ding (2024) found that mathematics self-efficacy strongly influences students' mathematics achievement and learning behavior. Similarly, Campanilla (2025) reported that learners with higher self-efficacy tend to perform better in mathematics and show greater confidence in solving mathematical problems. These findings support Bandura's (1997) proposition that individuals who believe in their capabilities are more likely to exert effort and persist in challenging academic tasks.

Further studies across various schools reveal the significance of self-efficacy in maths learning. In the study of Muhtadi et al. (2022), self-efficacy was found to positively correlate with mathematics learning ability in various studies. The relationship was, however, not always strong and depended on the type of education, the characteristics of the learners, and the assessment methods. The fact that this variation exists indicates that the effect of self-efficacy might not be consistent across all learning contexts and may vary according to the factors that may shape the learning context.

However, not all studies report a significant relationship between self-efficacy and mathematics achievement. Kunhertanti and Santosa (2018) found no significant relationship between students' self-confidence and mathematics performance. Rather than indicating that self-efficacy is unimportant, these conflicting findings suggest that differences in sample characteristics, instructional settings, and performance measures may influence the observed relationship between self-efficacy and achievement. Studies that report strong relationships often involve broader measures of mathematics achievement or learners exposed to supportive learning environments, whereas studies reporting weak relationships frequently involve more specific assessment contexts or populations with relatively homogeneous levels of self-efficacy. Therefore, inconsistencies in the literature may reflect methodological and contextual differences rather than contradictions in the theoretical role of self-efficacy itself.

Recent studies further suggest that mathematics achievement is influenced by a combination of instructional experiences and learners' existing knowledge base. Simonsmeier et al. (2021), in a meta-analysis of educational outcomes, reported that prior knowledge is a strong predictor of learning achievement, as learners with stronger foundational understanding tend to acquire new concepts more effectively. Similarly, Pizon and Ytoc (2022) found that instructional strategies and classroom learning experiences significantly influence mathematics achievement among secondary learners. These findings suggest that mathematics performance may be shaped by multiple interacting factors beyond learners' confidence beliefs alone. Consequently, both cognitive factors, such as prior knowledge, and instructional factors, such as teaching approaches and learning support, should be considered when examining learners' mathematical outcomes.

Bandura's (1997) Self-Efficacy Theory provides the theoretical basis for understanding these findings. The theory proposes that self-efficacy influences achievement indirectly through effort, persistence, goal setting, and resilience when encountering difficulties. Consequently, the theory predicts a positive association between mathematical self-efficacy and mathematical performance. Nevertheless, Bandura also acknowledged that self-efficacy does not operate independently and that environmental and instructional factors may strengthen or weaken their influence on academic outcomes. This perspective provides a useful framework for examining whether the expected relationship between self-efficacy and mathematical performance is evident among Grade 7 learners in the present study.

Sex differences in mathematics achievement and self-efficacy have also been examined in prior research. Else-Quest et al. (2010) explained that differences between males and females in mathematics are generally small, although social and academic factors may contribute to variations in performance. Hyde (2014) also argued that males and females are more alike than different in most academic areas, including mathematics. In the Philippines, research has also yielded a variety of results on sex differences in mathematics achievement. Some local studies have indicated that there is a slight edge to male learners in mathematical reasoning and problem-solving tasks; others report no difference between



male and female learners. The results of this study suggest that the gender gap in mathematics can be attributed to contextual and educational factors, which must be further explored in specific contexts and learner groups, in addition to biological factors.

Within the Philippine context, few studies have simultaneously examined mathematical self-efficacy, mathematical performance, and sex differences using localized assessment tools such as the Rapid Mathematics Assessment (RMA). Most existing studies focus on mathematics achievement or the isolation of self-efficacy. Therefore, the present study fills this gap by examining learners' mathematical self-efficacy, mathematical performance, and sex differences using the RMA as a contextualized assessment tool. The study additionally contributes to existing literature by providing evidence on learners' mathematical self-efficacy, foundational mathematical performance, and assessment outcomes within a local educational context.

Conceptual Framework

This study is grounded in Bandura's (1997) Self-Efficacy Theory, which emphasizes that learners' beliefs in their capabilities influence their motivation, persistence, and academic performance. Guided by this theory, the study examines the associations among learners' mathematical self-efficacy, initial mathematical performance, sex, and mathematical performance at the end of the school year. Figure 1 presents the conceptual framework of the study.

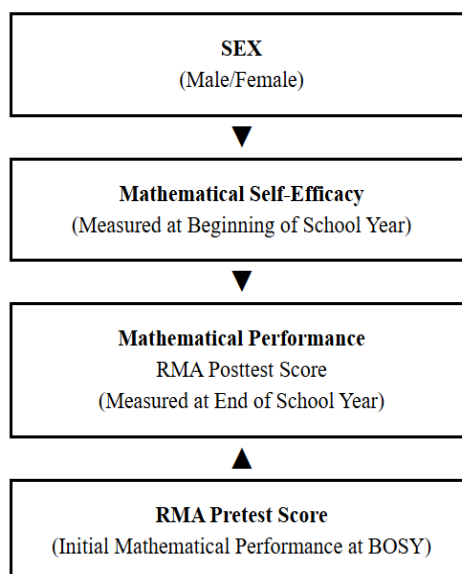


Figure 1. Conceptual Framework of the Study

Figure 1 shows the conceptual framework of the study. The framework shows the relationship between sex, mathematical self-efficacy, and the initial mathematical performance (pretest score on the Rapid Mathematics Assessment), with mathematical performance (posttest score on the Rapid Mathematics Assessment). Mathematical self-efficacy is the self-perception of the students' ability to perform mathematical tasks successfully, and pretest score is the level of foundational mathematical skills the students have at the start of the school year. Learner characteristics were included as sex to see if there were any differences in mathematical self-efficacy and mathematical performance.

The model is based on Bandura's (1997) Self-efficacy Theory, which states that learners who have higher self-efficacy in mathematics are more likely to exhibit higher levels of effort, persistence, and involvement in mathematical learning activities that may correlate with their higher level of mathematical performance. Similarly, students' initial mathematical ability as measured by their pretest scores could be related to their performance at the end of the school year.

The Rapid Mathematics Assessment (RMA) was used only as an assessment and not as an intervention. The RMA pretest was administered at the beginning of the school year (BOSY), and the



Mathematics Self-Efficacy Questionnaire was administered at the beginning of the school year (BOSY) and the RMA posttest at the end of the school year (EOSY) based on the Department of Education guidelines. The framework, therefore, serves as the foundation for a descriptive analysis of patterns, sex differences, and mathematics self-efficacy and mathematics performance of Grade 7 learners.

Methodology

Research Design

This study employed a quantitative descriptive-comparative-correlational research design using a single-group pretest-posttest approach to examine changes in the mathematical performance of Grade 7 learners as measured by the Rapid Mathematics Assessment (RMA). The descriptive component was used to determine the respondents' mathematical self-efficacy and mathematical performance profiles; the comparative component was used to examine differences according to sex and across testing periods; and the correlational component was used to determine the relationship between mathematical self-efficacy and posttest mathematical performance.

The study was conducted to describe the patterns, differences, and associations between the variables studied. It was not intended to establish causal relationships. Thus, any differences noted in mathematics performance on the pretest and posttest should be viewed as changes during the time spent in the classroom, not just as changes due to instruction.

Sample

The respondents consisted of 47 Grade 7 learners enrolled at Mayor Alfonso D. Tan High School, Tangub City, during School Year 2025-2026. Of the respondents, 27 (57.4%) were male, and 20 (42.6%) were female.

A complete enumeration approach was employed, wherein all Grade 7 learners in the identified cohort participated in the study. Consequently, the sample represents a school-based convenience sample rather than a randomly selected population sample. The data provided here helped gain insight into the mathematical self-efficacy and mathematical performance of the respondents, but may not be broadly applicable to other populations of students without further research with larger and more representative samples.

Research Instruments

1. Rapid Mathematics Assessment (RMA)

The Rapid Mathematics Assessment (RMA) is a diagnostic assessment developed for the Department of Education's (DepEd) National Mathematics Program (NMP) (Department of Education, 2023) by the University of the Philippines National Institute for Science and Mathematics Education Development (UP NISMED) in collaboration with the ABC+ Project, UNICEF, and DepEd instructional leaders. The assessment was developed to measure the basic mathematical skills of the learners and also to look for gaps in learning that may need specific attention in teaching.

To institutionalize the administration of the RMA, the appropriate DepEd issuances have been made, such as DepEd Memorandum No. 842, s. The DepEd Memorandum 2023, No. DM-CT-2024-284 and DepEd Memorandum 2025, No. DM_s2025-036, which supports the use of diagnostic assessments for learner grouping and planning for interventions. The assessment is also consistent with the Academic Recovery and Accessible Learning (ARAL) Program Act (Republic Act No. 12028), which encourages learning gap interventions based on evidence.

In this study, the RMA was administered as a pretest at the beginning of the school year (BOSY) and as a posttest at the end of the school year (EOSY) to assess learners' foundational mathematical competencies and monitor changes in performance over time.

Although the RMA was originally developed to assess foundational numeracy skills, it was utilized in this study to evaluate foundational mathematical competencies among Grade 7 learners. The assessment was not intended to measure mastery of the Grade 7 mathematics curriculum. Rather, it was used to determine the extent to which learners demonstrated foundational mathematical skills that support higher-level mathematical learning. Thus, proficiency levels reported by the RMA should be viewed as a measure of the foundation of mathematics, not as a complete assessment of Grade 7 mathematics achievement. Limitations should be considered when interpreting the findings.





2. Mathematics Self-Efficacy Questionnaire

Mathematical self-efficacy was measured using a Mathematics Self-Efficacy Questionnaire adapted from the Mathematics Self-Efficacy Scale (MSES) developed by Betz and Hackett (1983). The instrument was contextualized to suit the linguistic and educational background of Filipino Grade 7 learners and measured three dimensions of mathematical self-efficacy: Confidence in Solving Mathematical Problems (CSMP), Confidence in Learning Mathematics (CLM), and Confidence in Performing Mathematical Tasks (CPMT).

Responses were scored using a five-point Likert scale ranging from 1 (Very Low Confidence) to 5 (Very High Confidence). The overall mathematical self-efficacy score was computed as the mean of all item responses, with higher scores indicating greater levels of mathematical self-efficacy.

Before administration, the adapted Mathematics Self-Efficacy Questionnaire underwent expert content review to ensure the relevance, clarity, and appropriateness of the items for Grade 7 learners. The instrument was evaluated by experts in mathematics education and educational research, who reviewed the questionnaire for content validity and contextual suitability. Revisions were incorporated based on their recommendations to improve item clarity and alignment with the study objectives.

For the reliability of the adapted instrument, the internal consistency was measured by Cronbach's alpha and McDonald's omega coefficients. The Cronbach's alpha coefficient for the questionnaire was .934, and the McDonald's omega coefficient was .935, which is excellent internal consistency reliability (Taber, 2018). The findings indicate that the instrument was able to measure the mathematical self-efficacy of the respondents in a reliable way. All items had acceptable to strong relationships with the overall scale, with a range of .446 to .796 for item-rest correlation. All items were retained for final analysis because the reliability coefficients were consistently high when items were dropped.

Ethical Considerations

Before data collection, permission to conduct the study was secured from the school administration. Participation in the study was voluntary. Informed consent was obtained from the parents or guardians of the learners, while assent was obtained from the participating students.

Respondents were informed of the purpose of the study, the voluntary nature of their participation, their right to withdraw at any time without penalty, and the confidentiality of the information they provided. The data collected was treated with absolute confidentiality and only used for the purpose of the study and research. There was no information about identifiable data provided in the presentation of the results.

Data Gathering Procedure

Data collection was conducted in two phases.

At the beginning of the school year (BOSY), the Rapid Mathematics Assessment (RMA) was administered as a pretest to establish learners' baseline level of foundational mathematical competence. At the same time, the Mathematics Self-Efficacy Questionnaire was given to determine the mathematical tasks that were perceived as self-confident before the normal teaching and learning of mathematics was carried out in the classroom.

Following the baseline assessment, learners participated in regular mathematics instruction throughout the school year in accordance with the Department of Education curriculum. Instruction was provided through normal classroom teaching, guided practice, classroom testing, and learning tasks provided by the assigned mathematics teacher.

At the end of the school year (EOSY), the Rapid Mathematics Assessment (RMA) was administered again as a posttest to assess learners' mathematical performance following a year of classroom instruction.

It should be noted that the study did not include a control group. Consequently, threats to internal validity such as maturation, test familiarity, external learning experiences, absenteeism, and other school-related factors could not be completely controlled. Thus, gains that are seen from pretest to posttest are not necessarily considered final evidence of causal instructional effects.

Data Analysis

Descriptive and inferential statistical techniques were used to analyze the data.





Frequency, mean, and standard deviation were computed to describe mathematical self-efficacy and mathematical performance according to sex.

The normality of the data was evaluated using the Shapiro-Wilk test before inferential analysis. Nonparametric statistical procedures were used because some of the variables did not meet the assumption of normality.

To assess if there is a significant difference between the pretest and post-test scores, the Wilcoxon Signed-Rank Test was used. The difference in mathematical performance and mathematical self-efficacy between the respondents classified based on sex was analyzed using the Mann-Whitney U Test. Spearman's rank-order correlation coefficient (ρ) was used to determine the relationship between mathematical self-efficacy and posttest mathematical performance.

All statistical analyses were performed using Jamovi statistical software with a significance level of $\alpha = .05$.

Use of Artificial Intelligence (AI) Tools

ChatGPT (OpenAI) and Grammarly were used solely for language editing, grammar checking, formatting assistance, and manuscript organization. These tools were not used to generate research findings, statistical analyses, interpretations, conclusions, or scholarly arguments. All data analyses, interpretations, and final manuscript content were reviewed, verified, and approved by the researchers, who assume full responsibility for the accuracy, integrity, and intellectual content of the study.

Limitations of the Study

There are some limitations that need to be considered when concluding the results of this study. The study adopted a school-based convenience sampling of only 47 Grade 7 learners from one public secondary school located in Tangub City. As such, the results can only be applied to the respondents in this study and cannot be extrapolated to a broader population without additional research with more varied and representative samples.

Secondly, the study used a pre-test/post-test quasi-experimental approach without a control group. Therefore, the gains seen from pretest to posttest are not necessarily due to classroom instruction. The observed changes in mathematical performance may also have been influenced by other factors like maturation, familiarity with the tests, events outside the classroom, and time.

Third, although the Rapid Mathematics Assessment (RMA) was used in accordance with Department of Education policies and issuances, the instrument was originally developed to assess foundational numeracy competencies. Thus, the proficiency classifications generated by the RMA should be interpreted as indicators of foundational mathematical competence rather than comprehensive measures of Grade 7 mathematics achievement.

Fourth, mathematical self-efficacy was only assessed at the start of the school year. Thus, the study could not measure changes in learners' self-efficacy over time, nor whether self-efficacy increased or decreased during the instructional period.

Lastly, the study was limited to selected variables: mathematical self-efficacy, mathematical performance, and sex. Other factors that may be related to mathematics achievement (socio-economic status, academic achievement before school, attendance, parental support, learning resources, instructional practices, etc.) were not explored. These variables could be included in future research to gain a better understanding of learners' mathematical performance.

Results and Discussion

This chapter presents the results, providing a comprehensive evaluation of the collected data and a detailed discussion of its significance and implications.





Table 1: Mathematical Self-Efficacy and Mathematical Performance Profiles of the Respondents According to Sex

Variable	Sex	N	Mean	SD
Mathematical Self-Efficacy	Male	27	3.65	0.590
	Female	20	3.61	0.507
RMA Pretest Score	Male	27	5.55	2.724
	Female	20	2.59	2.135
RMA Posttest Score	Male	27	35.70	5.060
	Female	20	32.05	3.034

Table 1 presents the mathematical self-efficacy and mathematical performance profiles of the respondents according to sex. Male respondents obtained a mean mathematical self-efficacy score of 3.65 (SD = 0.590), while female respondents obtained a mean score of 3.61 (SD = 0.507), indicating relatively similar levels of perceived mathematical capability between the two groups.

In terms of mathematical performance, male respondents obtained higher mean scores than female respondents in both the RMA pretest and posttest. The mean score of the pretest for male learners was 5.55 (SD = 2.724), while female learners were at 2.59 (SD = 2.135). Similarly, male learners obtained a higher mean posttest score (M = 35.70, SD = 5.060) than female learners (M = 32.05, SD = 3.034).

These results indicate gender differences in mathematical performance across the sample, but not that much in mathematical self-efficacy. The findings of this descriptive study should be taken with a pinch of salt; however, due to the small sample size and the limited number of schools, it should not be generalized to people outside the study. These observed differences are further explored statistically in Table 5.

Table 2 Level of Mathematical Self-Efficacy of The Respondents

	Mean	SD	Min	Max	Interpretation
Self-Efficacy (Overall)	3.63	0.552	2.68	4.61	
Confidence in Solving Mathematical Problems (CSMP)	3.69	0.488	2.63	4.63	Moderately High
Confidence in Learning Mathematics (CLM)	3.61	0.680	2.50	4.83	
Confidence in Performing Mathematical Tasks (CPMT)	3.59	0.641	2.50	4.83	

Table 2 presents the respondents' level of mathematical self-efficacy. The overall mean of 3.63 (SD = 0.552) indicates a moderately high level of mathematical self-efficacy among the respondents. This finding suggests that the learners generally perceived themselves as capable of learning mathematics, solving mathematical problems, and performing mathematical tasks. Self-Efficacy Theory (Bandura, 1997) posits that when faced with academic challenges, learners with stronger self-efficacy beliefs are more likely to exhibit greater motivation, persistence, and resilience.

Among the three dimensions, Confidence in Solving Mathematical Problems (CSMP) obtained the highest mean score (M = 3.69, SD = 0.488), followed by Confidence in Learning Mathematics (CLM) (M = 3.61, SD = 0.680) and Confidence in Performing Mathematical Tasks (CPMT) (M = 3.59, SD = 0.641). The relatively high score in problem-solving confidence indicates that the respondents generally had a strong confidence in their ability to solve problems involving mathematics, but a slightly lower score in learning and task performance implies that some learners might still be unsure when they are using mathematical knowledge in various contexts.

Bandura (1997) noted that self-efficacy beliefs shape students' approaches to tasks, efforts made, and persistence even when faced with challenges; similarly, Honicke and Broadbent (2016) noted that there is a generally positive relationship between self-efficacy and academic behaviors and achievement outcomes, although this relationship varies as a function of the educational context.





The findings also indicate that the respondents started the school year with mostly positive attitudes towards their mathematical abilities. But mathematical performance is not dependent on a moderate level of self-efficacy. This difference is relevant to the findings of the relationship between self-efficacy and mathematical performance discussed later in this study because of the focus of the measures on foundational skills. (Honick & Broadbent, 2016; Zakariya, 2022).

Overall, the results indicate that the respondents possessed relatively positive perceptions of their mathematical capabilities across the three dimensions of self-efficacy. The results imply that self-efficacy is a significant psychological factor that can impact students' involvement in math, but that this impact can vary depending on the skill being evaluated and the learning environment within which students learn math.

Table 3: Level of Mathematical Performance of the Respondents in the Rapid Mathematics Assessment (RMA) Pretest and Posttest

Test Type	Mean	SD	Min	Max	N	Proficiency Level
Pretest	3.23	2.28	0	10	40	Emerging (Not Proficient)
	7.43	2.94	3	13	7	Emerging (Low Proficient)
Posttest	33.7	4.24	31	43	45	Developing (Nearly Proficient)
	44.0	0.00	44	44	2	Transitioning (Proficient)

Table 3 presents respondents' levels of mathematical performance on the Rapid Mathematics Assessment (RMA) pretest and posttest, organized by proficiency classification. The findings reveal that learners demonstrated low mathematical proficiency during the pretest but showed considerable improvement in the posttest following sustained classroom instruction and learning interventions.

During the pretest, most respondents were classified under the Emerging proficiency levels, indicating limited mastery of the foundational mathematical competencies assessed by the RMA. Specifically, 40 learners were categorized as Emerging (Not Proficient), with a mean score of 3.23 (SD = 2.28), while 7 learners were classified as Emerging (Low Proficient), with a mean score of 7.43 (SD = 2.94). These findings suggest that many respondents initially had trouble demonstrating the foundational mathematical skills measured by the assessment.

The predominance of Emerging proficiency levels during the pretest is consistent with broader evidence indicating persistent challenges in foundational mathematics learning among Filipino learners. Results from the Programme for International Student Assessment (PISA) 2022 showed that many Filipino students performed below the minimum proficiency level in mathematics, highlighting continuing concerns regarding mathematical literacy and numeracy development (OECD, 2023). Although the RMA and PISA measure different constructs, both assessments underscore the importance of strengthening foundational mathematical competencies.

In contrast, the posttest results indicate a substantial improvement in learners' mathematical performance following regular classroom instruction throughout the school year. Most respondents (n = 45) progressed to the Developing (Nearly Proficient) level, with a mean score of 33.70 (SD = 4.24), ranging from 31 to 43. This suggests that learners were able to acquire and demonstrate improved understanding of mathematical concepts and skills after instruction. Furthermore, two learners advanced to the Transforming (Proficient) level, achieving a mean score of 44.00 (SD = 0.00). These findings indicate that respondents demonstrated higher levels of foundational mathematical competence at the end of the school year compared with their initial performance at the beginning of the year.

The number of students in Emerging proficiency and the number in Developing and Transitioning proficiency as reported at the pretest and the posttest indicate that there were meaningful gains in the mathematical skills measured by the RMA across the two groups. This improvement should be interpreted with caution, however. Since the study was a single-group pretest-posttest design with no control group, the results of this design should not be interpreted as exclusively due to classroom instruction. There may also be other factors that contributed to the improvement in scores, such as natural maturation or greater familiarity with assessment procedures and other learning experiences that may have occurred throughout the school year.

In addition, the Rapid Mathematics Assessment was not designed to measure all Grade 7 mathematics content, but rather to measure basic mathematical skills. Thus, the results of the





proficiency classification presented in this study should be understood as a sign of learners' basic mathematical capability and not as a complete picture of mathematics achievement. In this context, the results indicate that the respondents have improved their fundamental mathematical skills, but not as evidence to show that they have mastered the competencies of Grade 7 mathematics.

Results, however, are consistent with the research that highlights the importance of ongoing assessment and feedback for moving forward with learning progress. Black and Wiliam (1998) suggested that formative assessment practices support learning through giving information that can inform teaching and learning. Likewise, Hattie (2009) found that feedback and continuous assessment of learning were some of the most powerful influences for student success. The results reported here do not indicate a cause-and-effect relationship in instruction, but they do show that students' mathematical skills ended the school year higher than they started it.

Table 4 Significant Difference Between the Pretest and Posttest Scores of the Respondents

	Mean	Mean Difference	Test Statistic Value (Wilcoxon W)	p-value
Pretest Score	3.85	-30.0	0.001	<0.01
Posttest Score	34.15			

Table 4 presents a comparison of pretest and posttest scores using the Wilcoxon signed-rank test. The results show that the mean pretest score ($M = 3.85$) is substantially lower than the mean posttest score ($M = 34.15$), indicating a notable increase in performance after the intervention. The computed p-value ($p < 0.01$) is less than the significance level, indicating a statistically significant difference between the pretest and posttest scores.

Results indicated that respondents' mathematical performance on the posttest administration was higher than on the pretest administration. A statistically significant difference means that the difference between the scores observed was not due to chance. Therefore, it can be concluded that there was no null hypothesis, as the scores before and after the study were not the same, as the difference was significant.

The findings show significant improvements in performance over time, but care needs to be taken when interpreting the source of this improvement. The study adopted a single-group pretest-posttest design, with no control group, so gains seen within it are not necessarily due to classroom teaching. Other factors contributing to the increase in scores may include developmentally appropriate learning, additional exposure to the assessment format, familiarity with math concepts from repetition, and additional school year experiences.

It is important to note that the findings should be regarded as a sign of better mathematical achievement in the two assessment periods and not as evidence of the effectiveness of instruction. This distinction is significant as the primary aim of the present design was to detect change in performance over time, and not to establish causal relationships.

However, the observed improvement is consistent with the literature suggesting that continuous learning experiences, assessment practices, and instructional support are associated with positive academic growth. Black and Wiliam (1998) emphasized that ongoing assessment and feedback provide valuable information that can support learning progress, while Hattie (2009) identified feedback and visible learning practices as important contributors to student achievement. Although the present study cannot isolate the specific factors responsible for the observed gains, the findings suggest that respondents demonstrated higher levels of mathematical competence at the end of the school year than at its beginning.

Overall, the results show that there was a statistically significant improvement in mathematical achievement from pretest to posttest. However, given the limitations of the research design, the findings should be interpreted as evidence of performance improvement over time rather than conclusive evidence that the instructional approach alone caused the observed gains.





Table 5 Difference in Mathematical Self-Efficacy and Mathematical Performance According to Sex

Variables	Group	Mean	SD	Test Statistic Value (Mann-Whitney U)	p-value
Pretest Score	Male	5.55	2.724	98.0	<.001
	Female	2.59	2.135		
Posttest Score	Male	35.70	5.060	167.5	0.015
	Female	32.05	3.034		
Self-Efficacy	Male	3.65	0.590	249.0	0.659
	Female	3.61	0.507		

Note. $H_a: \mu_{\text{Male}} \neq \mu_{\text{Female}}$

Table 5 presents a comparison of respondents' scores, grouped by sex, using the Mann–Whitney U test. For the pretest scores, male respondents ($M = 5.55$, $SD = 2.724$) obtained significantly higher scores than female respondents ($M = 2.59$, $SD = 2.135$), with a $p\text{-value} < .001$. This finding indicates a statistically significant difference in baseline mathematical performance between the two groups.

Similarly, for the posttest scores, males ($M = 35.70$, $SD = 5.060$) also scored higher than females ($M = 32.05$, $SD = 3.034$), with a $p\text{-value} = 0.015$, which is less than the 0.05 level of significance. The results indicate that differences in mathematical performance remained evident at the end of the school year. In contrast, no significant difference was found in mathematical self-efficacy between male respondents ($M = 3.65$, $SD = 0.590$) and female respondents ($M = 3.61$, $SD = 0.507$), as reflected by the $p\text{-value}$ of .659. This suggests that both groups reported comparable levels of confidence in their mathematical abilities.

The findings indicate that male respondents obtained higher mathematical performance scores than female respondents within the present sample. However, these results should be interpreted cautiously. The sample consisted of only 47 learners from one secondary school, and no controls were used for other factors that could affect mathematics achievement, such as prior academic preparation, attendance, socioeconomic status, access to learning resources, and other learner characteristics. Therefore, the differences observed should not be interpreted as sex being the only factor to influence mathematical performance.

The results contrast somewhat with recent studies indicating that most sex differences in mathematics performance are small and, in many cases, disappear when comparing the performance of mathematically proficient girls and boys with similar contextual backgrounds and educational opportunities (Else-Quest et al., 2010; Hyde, 2014). The lack of a significant difference between males and females in mathematical self-efficacy is especially important as it indicates that male and female respondents had similar levels of confidence in their ability to perform mathematical tasks despite the difference in mathematics performance outcomes. Such a pattern suggests that mathematical competence may not be equivalent to actual mathematical performance within groups of learners.

The differences observed may be school- and respondent-specific and do not necessarily represent broader differences that would be seen in other populations. Thus, the results should be interpreted as local evidence of the experience of the learners participating in this study and not as evidence of sex differences in mathematics achievement in general.

Overall, the results partially support the alternative hypothesis ($H_a: \mu_{\text{Male}} \neq \mu_{\text{Female}}$). Significant differences were found in pretest and posttest mathematical performance scores, whereas no significant difference was observed in mathematical self-efficacy.





Table 6 Relationship Between Mathematical Self-Efficacy and Posttest Mathematical Performance

Variables	Correlation Coefficient (Spearman's rho)	p-value
Self-Efficacy and Posttest	-0.058	0.700

Table 6 shows the relationship between self-efficacy and posttest scores using Spearman's rho. The results revealed a very weak negative correlation between the two variables ($\rho = -0.058$) with a p-value of .700. Since the p-value exceeded the .05 level of significance, the relationship was not statistically significant. Therefore, the null hypothesis of no significant relationship between mathematical self-efficacy and posttest mathematical performance was not rejected.

The findings indicate that learners' reported confidence in their mathematical abilities was not significantly associated with their posttest performance on the Rapid Mathematics Assessment (RMA). The results are contrary to Bandura's (1997) Self-Efficacy Theory, which holds that people with higher self-efficacy are more likely to exhibit higher levels of persistence, effort, and performance on academic tasks. Likewise, past research has found positive correlations between mathematics self-efficacy and academic achievement (Honicke & Broadbent, 2016; Zakariya, 2022).

However, the absence of a significant relationship in the present study does not necessarily invalidate the theoretical importance of self-efficacy. Rather, it suggests that the relationship between self-efficacy and performance may depend on the specific nature of the constructs being measured. The Mathematics Self-Efficacy Questionnaire measured the learners' confidence in learning mathematics, solving mathematical problems, and completing mathematical tasks in a relatively general manner. The Rapid Mathematics Assessment, on the other hand, was aimed at measuring a set of specific mathematical competencies. As a result of this, there is the possibility that the two instruments measured similar, but not identical, aspects of mathematical capability.

This distinction may help explain why respondents reported moderately high levels of mathematical self-efficacy while simultaneously demonstrating varying levels of performance on the RMA. Learners may feel confident that they are able to relate to mathematics in general, but not be able to demonstrate competence in some basic skills evaluated by the instrument. At times, therefore, perceived competence and measured competence may not coincide, especially when different aspects of mathematical competence are being evaluated.

The findings also support previous observations that the relationship between self-efficacy and achievement is not uniform across contexts. The links between self-efficacy and academic outcomes have been inconsistent and inconsistent across different studies, educational contexts, and measurement methods (Honicke & Broadbent, 2016). Based on the findings of the present study, it can be concluded that mathematical self-efficacy is not enough to account for the difference in the mathematical basic skills of the respondents.

Overall, the findings indicate that mathematical self-efficacy was not a significant predictor of posttest mathematical performance within the present sample. Rather than contradicting the importance of self-efficacy, the results highlight the complexity of the relationship between learners' perceived capabilities and their demonstrated performance, particularly when confidence beliefs and achievement outcomes are measured using instruments that assess different aspects of mathematical competence.

Knowledge Contribution

This study contributes to mathematics education research and practice in several important ways.

1. Provides Localized Evidence on Mathematical Self-Efficacy, Performance, and the Use of the Rapid Mathematics Assessment (RMA)

The study provides local evidence for the mathematical self-efficacy and mathematical baseline performance of Grade 7 learners in the context of the Philippines. It also offers empirical data regarding the use of the Rapid Mathematics Assessment (RMA) as a diagnostic and monitoring instrument to detect learning gaps, monitor learner development, and guide instruction. Findings will add to the existing body of literature in mathematics education in the Philippines, as local studies using the RMA are still scarce at the secondary education level.





2. Provides an Integrated Examination of Mathematical Self-Efficacy, Mathematical Performance, and Sex

The study explored mathematical self-efficacy, mathematical performance, and gender differences together in one study. Given that these variables were explored simultaneously, the research offers a more holistic view of the learners' mathematical experiences and offers a piece of evidence about the relationships and differences between these variables in the context of this research.

3. Identifies Contextual Boundaries in the Relationship Between Self-Efficacy and Mathematical Performance

Unlike studies that reported a positive correlation, this study did not find any significant relationship between mathematical self-efficacy and the posttest mathematical performance. This result does not illustrate an extension of Bandura's Self-Efficacy Theory, but it is a reminder that the link between self-efficacy and attainment may differ in context, learner population, and across measurement methods. The findings indicate a possible relationship between the constructs assessed and the nature of the assessment; thus, the relationship between a student's perceived competence and actual performance may vary based on these factors.

4. Supports the Value of Continuous Assessment and Evidence-Based Instructional Planning

The study noted significant gains in student mathematics achievement from pretest to posttest administration of the RMA. While the research design does not allow for any causal statements about the effectiveness of instruction, it does highlight the importance of ongoing assessment to track learner progress and provide evidence that can inform decisions about instruction, interventions, and learner support.

5. Serves as a Basis for Future Research and Educational Practice

The results serve as initial data that could be used to inform future research, school-based intervention programs, curriculum improvement programs, and mathematics teaching and learning. Further studies could be conducted with larger and more diverse samples, with more rigorous research designs, and with other variables to further explore the factors that influence mathematical performance and self-efficacy of learners.

Discussion

The findings revealed that seventh-grade students had a comparatively high level of mathematical self-efficacy, suggesting they generally possessed confidence in their ability to address mathematical challenges, learn mathematical concepts, and perform mathematical operations. This finding corresponds with Bandura's (1997) Self-Efficacy Theory, which posits that individuals with strong efficacy beliefs are more likely to demonstrate persistence, motivation, and resilience when confronted with challenging academic tasks. In a similar vein, the overall level of self-efficacy shown in this study aligns with the findings of Ding (2024), who suggested that self-efficacy in mathematics positively influences students' engagement and achievement in the subject. However, even though students demonstrated a relatively high degree of confidence, this self-assurance did not intrinsically lead to enhanced mathematical performance.

The study further indicated a significant improvement in students' mathematical skills from the RMA pretest to the posttest. The predominant number of participants progressed from the Emerging competence level to either the Developing or Transitioning proficiency levels, indicating improvement in fundamental mathematical abilities after one academic year. These findings support previous research emphasizing the necessity of continuous assessment and classroom feedback to improve educational outcomes. Black and Wiliam (1998) argued that formative assessment enables educators to identify learning gaps and adjust their instructional strategies, whereas Hattie (2009) acknowledged feedback as a crucial element influencing student achievement. However, given the study's employment of a single-group pretest-posttest design without a control group, the observed improvement should not be interpreted exclusively as evidence of teaching effectiveness. Supplementary factors such as student growth, increased consciousness of the assessment, and regular classroom engagement may have contributed to the enhancements.





Regarding sexual distinction, male participants attained significantly better pretest and posttest outcomes than their female counterparts. However, no significant difference was detected in mathematical self-efficacy. The findings suggest that although male students performed better on the RMA within our sample, both sexes had comparable confidence in their mathematical abilities. This is somewhat consistent with the research conducted by Else-Quest et al. (2010) and Hyde (2014), which indicated that gender differences in mathematics are often slight and influenced by contextual, pedagogical, and sociocultural factors rather than merely biological differences. As a result, the variations observed in this research should be approached with prudence owing to the restricted and localized sample size.

A really significant finding was that mathematical self-efficacy did not show a considerable relationship with posttest mathematical performance. This result diverges from several studies suggesting positive associations between self-efficacy and mathematics achievement (Honick & Broadbent, 2016; Zakariya, 2022). One possible explanation is that the Mathematics Self-Efficacy Questionnaire evaluated students' general confidence in mathematics, whereas the Rapid Mathematics Assessment (RMA) concentrated on basic mathematical competencies. Consequently, students may have perceived themselves as skilled in mathematics, yet continued to encounter difficulties in demonstrating mastery of the essential skills assessed. This examination corresponds with Muhtadi et al. (2022), who noted that the strength of the relationship between self-efficacy and achievement varies according to learner characteristics, educational contexts, and assessment methods.

The findings suggest that mathematical self-efficacy alone cannot explain differences in students' mathematical performance. Mathematical achievement appears to be influenced by multiple interconnected factors, including prior knowledge, instructional quality, educational experiences, and assessment techniques. Simonsmeier et al. (2021) identified prior knowledge as a crucial determinant of academic achievement, whereas Pizon and Ytoc (2022) emphasized the vital importance of teaching strategies in improving mathematics learning outcomes. Thus, programs designed to enhance mathematical achievement should not only elevate students' confidence but also improve fundamental mathematical abilities through experiential teaching techniques, continuous assessment, and targeted educational support. These findings highlight the importance of the Rapid Mathematics Assessment (RMA) as a diagnostic tool for identifying learning gaps and informing teaching methods within the MATATAG curriculum.

Recommendation

Based on the findings of the study, the following recommendations are proposed:

1. For Mathematics Teachers

The Rapid Mathematics Assessment (RMA) results are used as a way for mathematics teachers to plan differentiated instruction and targeted learning interventions in a way that maximizes outcomes. Remediation activities to support learners at the Emerging proficiency level can be targeted toward basic numeracy skills, guided practice, and scaffolded learning experiences. Enrichment activities, higher-level problem-solving, and collaborative learning opportunities can be offered to learners at the Developing and Transitioning levels to further build their mathematical skills. The teachers are also encouraged to continue to use formative assessment practices to track the progress of learners and modify instruction to meet identified learning needs.

2. For School Administrators

Successful assessment-based instructional support programs should be strengthened by having school administrators provide professional learning around data-informed decision-making and interpretation of assessment results, as well as differentiated instruction. The use of workshops for analysing and interpreting RMA results can assist teachers in planning more responsive interventions for students who have mathematical problems. Furthermore, schools should consider putting in place learner support programs that focus on academic and motivational issues that impact mathematics achievement, especially for those learners in the bottom 20% of the achievement scale in mathematics who have shown persistent achievement gaps.

3. For Curriculum Planners and Policymakers





Continuing to support evidence-based instructional practices that build foundational mathematical skills would benefit curriculum planners and policymakers. Information gathered from the assessment using diagnostic tools like RMA can be systematically used to guide curriculum implementation, intervention programs, and learner support. Focus should be particularly placed on developing basic numeracy skills, as these are important stepping stones to more advanced mathematical learning.

4. For Future Researchers

Future researchers are encouraged to replicate the study with larger and more diverse samples from multiple schools and educational settings that will further extend the generalizability of findings. More sophisticated analytic methods, such as regression or structural equation modeling, might also be used to investigate the interactive effects of self-efficacy, prior achievement, and socio-demographic characteristics on mathematics achievement.

Furthermore, it is suggested that the mixed methods research design be used, which includes qualitative interviews, focus group discussions, or learner reflections. These would offer a better understanding of the processes underlying the fact that learners with relatively high self-efficacy in mathematics do not necessarily perform at similarly high levels in assessments of basic mathematical skills. Other factors that could be explored in future studies include socioeconomic status, parental involvement, learning strategies, classroom climate, and mathematics anxiety to gain a better understanding of what contributes to mathematics achievement.

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