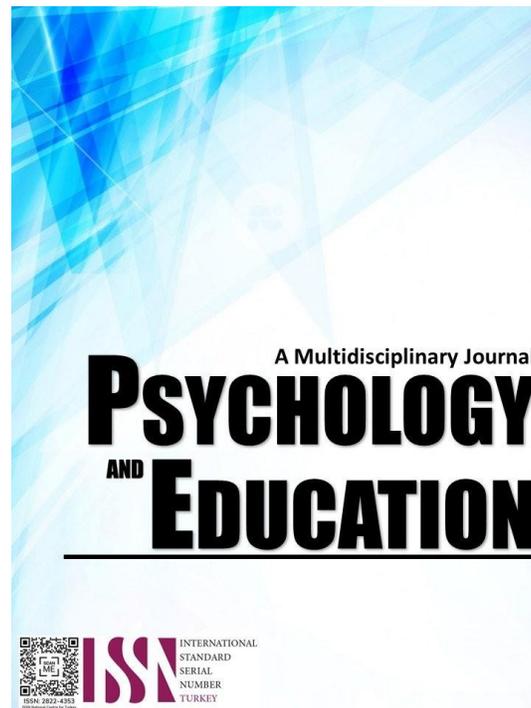


**THE STRUGGLE WITH MATH: INVESTIGATING THE LINK BETWEEN  
MATH ANXIETY AND MATHEMATICAL PERFORMANCE AMONG  
GRADE 10 STUDENTS AT SAINT MARY’S UNIVERSITY JUNIOR  
HIGH SCHOOL AND SCIENCE HIGH SCHOOL**



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## The Struggle with Math: Investigating the Link Between Math Anxiety and Mathematical Performance Among Grade 10 Students at Saint Mary's University Junior High School and Science High School

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### Abstract

Mathematics plays a vital role in academic success and future opportunities, yet many students struggle with mathematics anxiety, which undermines their performance. This study examined the relationship between mathematics anxiety and mathematical performance among Grade 10 students at Saint Mary's University Junior High School and Science High School. Using quantitative and qualitative approaches within a descriptive-comparative-correlational design, this study measured perceived mathematics anxiety levels, explored differences by sex, curriculum type, academic standing, and mathematical performance, and identified recommendations and anxiety-inducing topics and activities. Results revealed that students generally experience a medium level of mathematics anxiety, with significant differences between curriculum types and performance levels, but not between sexes or academic standings. A moderately negative correlation between anxiety and performance was also found. Students identified geometry, trigonometry, and word problems as the most anxiety-inducing topics and activities, while recommending peer tutoring as an effective strategy for improving performance and reducing anxiety. Overall, the study highlights the importance of early identification of math-anxious students and the use of collaborative, supportive teaching strategies that address both cognitive and emotional aspects of learning, with implications for curriculum design and targeted classroom interventions.

**Keywords:** *coping mechanisms, curriculum differences, educational intervention, mathematics anxiety, mathematical performance, peer tutoring*

### Introduction

Education serves as the foundation of personal and national development. It equips individuals with the knowledge, skills, and values necessary to contribute meaningfully to society and respond to the demands of a rapidly changing world. In the Philippines, education is recognized as a vital tool for fostering social progress and economic growth. The Department of Education (DepEd) implements the K-12 Basic Education Curriculum, which aims to provide learners with holistic development and prepare them for higher education, employment, and lifelong learning (Department of Education [DepEd], 2023). Under this system, basic education includes Kindergarten, six years of elementary education, four years of junior high school, and two years of senior high school.

At the junior high school level (Grades 7-10), students are introduced to a wide range of learning areas that support intellectual and character development. The curriculum covers English, Filipino, Science, Mathematics, Araling Panlipunan (Social Studies), MAPEH (Music, Arts, Physical Education, and Health), Edukasyon sa Pagpapakatao (Values Education), and Technology and Livelihood Education (DepEd, 2023). These subjects are designed to develop learners' communication, critical thinking, and problem-solving skills while preparing them for higher academic challenges. Among these disciplines, mathematics plays a particularly significant role as it strengthens logical reasoning, analytical thinking, and quantitative literacy, which are skills that are crucial for daily life and for pursuing careers in science, technology, engineering, and economics.

However, despite these goals, many Filipino students encounter challenges in achieving the expected learning outcomes. The transition from elementary to junior high school often brings increased academic demands, leading to stress and adjustment difficulties among learners. A study conducted by Bagon (2024) found that mental health conditions, such as anxiety and emotional distress, are prevalent among secondary students in Batangas, affecting their focus and school performance. Similarly, Dakay et al. (2023) reported that junior high school students struggled with adapting to the "new normal" mode of learning, showing varied learning styles and difficulties in mathematics performance. These findings suggest that academic performance is influenced not only by intellectual capacity but also by emotional and psychological well-being.

In the context of the Philippine mathematics education, performance levels remain a concern. The Organisation for Economic Co-operation and Development (OECD) reported that Filipino students ranked among the lowest in mathematical literacy in the PISA 2022 assessment, scoring an average of 355 compared to the OECD average of 472 (OECD, 2023). Local studies echo this trend. Cabuquin and Abocejo (2023) observed that public high school students in Leyte exhibited below-average performance in mathematics, which correlated with overall academic achievement. Similarly, Pentang et al. (2023) highlighted the tendency of Filipino students to develop avoidance behaviors toward mathematics due to low confidence and negative attitudes. These findings reveal that while mathematics remains a cornerstone of education, many students struggle to meet its cognitive and emotional demands.

Addressing these challenges is essential to improving the quality of education in the country. Strengthening instructional strategies, promoting positive attitudes toward learning, and providing adequate psychological support can help students overcome barriers to academic success. By understanding the multifaceted nature of students' educational experiences, particularly in mathematics, educators and policymakers can better design interventions that foster both competence and confidence among junior high school learners.

Given these educational and psychological challenges, it becomes important to focus on one of the core subjects that strongly shapes students' learning experiences. Beyond being a requirement in the curriculum, mathematics serves as a foundation for logical thinking and problem-solving, skills that extend across various academic and real-life situations. Exploring mathematics as a discipline provides a clearer understanding of its importance in education and why it remains both essential and challenging for many Filipino students.

### **Research Questions**

This study aimed to determine the level of mathematics anxiety and its link to the mathematical performance of grade 10 students. The study aimed to answer the following questions:

1. What is the perceived level of mathematics anxiety among Grade 10 Students?
2. Is there a significant difference in the levels of mathematics anxiety among Grade 10 students when grouped according to:
  - 1.1 sex;
  - 1.2 academic standing;
  - 1.3 curriculum type; and
  - 1.4 mathematical performance?
3. Is there a significant relationship between mathematics anxiety and mathematical performance among Grade 10 students?
4. What suggestions do math-anxious students have for improving their mathematical performance and reducing their mathematics anxiety?
5. What particular math topics and activities make students anxious?

### **Methodology**

#### **Research Design**

This study used both quantitative and qualitative approaches to determine the relationship between mathematics anxiety and mathematical performance among Grade 10 students. The quantitative component followed a descriptive-comparative-correlational design. The descriptive aspect determined students' perceived levels of mathematics anxiety using a structured survey. The comparative aspect analyzed whether there are significant differences in anxiety levels when students are grouped according to sex, academic standing, curriculum type, and mathematical performance using appropriate statistical tests. The correlational aspect assessed the degree of relationship between mathematics anxiety and mathematical performance through statistical analysis to determine whether higher anxiety levels correspond to lower performance or vice versa. The qualitative component explored students' recommendations for improving mathematical performance and coping with anxiety, as well as identifying specific math topics and activities that cause anxiety. Data was collected through an open-ended questionnaire.

#### **Participants**

The participants involved in this research study were chosen from the Grade 10 students at Saint Mary's University Junior High School and Science High School. A total of 75 students were selected as the participants, which was determined based on the accessibility and availability of students within the institution during the data collection period. Using cluster sampling, the researchers randomly chose two sections, one from the regular curriculum and one from the science curriculum, to participate in the research to initially determine the goal of the study.

#### **Instrument**

The researchers adapted a survey questionnaire, specifically a Likert scale, as the primary data-gathering instrument, based on the research entitled *The Influence of Mathematics Anxiety in Middle and High School Students' Math Achievement* by Masooma Ali Al Mutawah (2015). Mathematical performance was measured using the Department of Education (DepEd) K to 12 grading system from the DepEd Order No. 8, s. 2015 to describe the previous final grades of Grade 10 students in mathematics. The questionnaire was divided into three parts.

Part one includes the necessary respondent profile information, such as sex, academic standing, type of curriculum (science or regular), and grade 10 final grade in mathematics. Part two consists of a Likert Scale measuring the level of math anxiety, using the Revised Mathematics Anxiety Survey (R-MANX). Part three gathers respondents' insights, identifying ways to minimize math anxiety, improve mathematical performance, and target math topics and activities that cause anxiety.

To ensure relevance and applicability, the questionnaire was modified by rewording certain items to align with the local educational context and the specific focus of this study. Furthermore, unnecessary or less relevant items from the original questionnaire were

removed or revised based on expert feedback. To ensure validity and reliability, the research instrument underwent pilot testing and validation by a math teacher and was tested using Cronbach's alpha reliability test.

### Procedure

The data collection process began in the first quarter of the school year 2025–2026 and followed a structured approach to ensure accuracy and reliability.

The data gathering procedure started with the researchers adapting a Likert scale from Mutawah (2015) to measure math anxiety among the respondents and to be able to investigate the link between math anxiety and mathematical performance among grade 10 students. The scales and questions were adjusted to suit the specific needs of this study, while still maintaining the general format and structure of the original. This adaptation aimed to make the instrument more relevant to the participants. The instrument then went to content validation by a mathematics teacher, who reviewed it to ensure that the questions were aligned with the study's goals. The researcher's research adviser also gave insights to ensure the questionnaire's ability to meet academic standards. The instrument was also tested for reliability using Cronbach's alpha to check for consistency in responses. When these steps were completed, the research adviser reviewed and approved the instrument for use. A formal written request for data collection was then submitted to the principal of Saint Mary's University Junior High School and Science High School. After receiving approval, the collection of necessary data from the respondents began.

### Data Analysis

The data gathered in this study are analyzed using both quantitative and qualitative methods to address the research questions comprehensively. Statistical techniques are used to measure and analyze the perceived levels of mathematics anxiety, while qualitative responses are analyzed to explore students' recommendations and insights.

Descriptive statistics were used to analyze the perceived levels of mathematics anxiety among Grade 10 students. The analysis included the computation of the mean and standard deviation to provide a summary of the students' responses. The mean scores were interpreted using the five-point Likert scale adapted from Velez and Velez (2023), where responses range from Never (1.00–1.80) to Always (4.21–5.00). Standard deviations were calculated to show the variability of responses. The classification was then used to determine the level of mathematics anxiety based on the Revised Mathematics Anxiety Survey (R-MANX) following the classification method of Mutawah (2015).

The frequency response scale was adapted from the study of Velez and Velez (2023). It serves as the basis for interpreting the students' responses on the level of mathematics anxiety. The scale used a five-point Likert format, where a mean score of 1.00–1.80 corresponds to "Never", 1.81–2.60 to "Rarely", 2.61–3.40 to "Sometimes", 3.41–4.20 to "Frequently", and 4.21–5.00 to "Always." Higher mean scores indicate that students more often experience anxiety-related behaviors in mathematics, while lower scores suggest that such anxieties are rarely or never experienced. Meanwhile, the classification of mathematics anxiety levels was based on R-MANX scores, adapted from Mutawah (2015). The study directly matches each assigned score and response option to an anxiety level. Specifically, responses of "Never" (1) indicate a low level of anxiety, "Rarely" (2) and "Sometimes" (3) correspond to a medium level of anxiety, while "Frequently" (4) and "Always" (5) reflect a high level of anxiety. This classification provides a straightforward framework for interpreting students' responses, with higher scores showing stronger and more frequent experiences of mathematics anxiety. In comparison, lower scores suggest minimal or no anxiety in math-related tasks.

The DepEd K to 12 grading scale from the DepEd Order No. 8, s. 2015, and performance descriptors, which served as the basis for assessing the mathematics performance of the respondents. The grading system classifies students' performance into five categories, ranging from "Outstanding" (90–100) to "Did Not Meet Expectations" (below 75), determining whether they passed or failed based on their scores.

Independent samples t-tests are employed to examine significant differences in mathematics anxiety levels when students are grouped according to sex and curriculum type. These tests compared the mean anxiety scores between two groups, determining whether differences exist based on these factors.

One-way analysis of variance (ANOVA) was used to determine differences in mathematics anxiety levels among students when grouped according to academic standing and mathematical performance. This statistical test determined whether significant mean differences exist among multiple groups, identifying variations in anxiety levels based on academic and performance-related factors.

Pearson's  $r$  correlation coefficient was used to measure the relationship between mathematics anxiety and mathematical performance. This statistical technique assesses whether higher anxiety levels are associated with lower mathematical performance or vice versa, or if the two variables are unrelated.

The study used thematic analysis to analyze the qualitative responses from students. Through open-ended questions, students provided insights into the challenges they face with mathematics anxiety, strategies they find helpful, suggestions for improving mathematical performance, and particular math topics and activities that make them anxious. Thematic analysis identified recurring themes and patterns in their responses, offering a deeper understanding and practical recommendations to support students in managing



mathematics anxiety and enhancing problem-solving skills.

## Results and Discussion

This section presents the analyzed results and discussion on the perceived level of mathematics anxiety among Grade 10 SMU students. It examines differences in anxiety levels when grouped by sex, academic standing, curriculum type, and mathematical performance, as well as the relationship between math anxiety and students’ mathematical performance based on their previous final grade in math. It also highlights students’ suggestions for improving performance and reducing anxiety, along with the specific topics that cause them to feel anxious.

Table 1. *Descriptive Statistics of the Perceived Level of Mathematics Anxiety of Grade 10 Students*

Statements	Mean	Std. Deviation	Verbal Interpretation	Level of Mathematics Anxiety
1. I feel relieved when a friend is chosen to answer a math question instead of me.	4.01	.92	Frequently	High Level of Anxiety
2. I panic when starting the math section of a standardized achievement test.	3.25	1.12	Sometimes	Medium Level of Anxiety
3. I struggle to ask questions about concepts that I don’t understand in math class.	3.09	1.20	Sometimes	Medium Level of Anxiety
4. I feel anxious when I receive math homework with many problems.	2.93	1.14	Sometimes	Medium Level of Anxiety
5. Holding a math textbook to study gives me a stomachache.	1.89	1.06	Rarely	Medium Level of Anxiety
6. I find it hard to concentrate on anything before math exam.	2.83	1.10	Sometimes	Medium Level of Anxiety
7. I hesitate to present solved problems to my teacher.	3.13	1.12	Sometimes	Medium Level of Anxiety
8. I can reject helping a child with his homework, because I am afraid of facing a question which I cannot solve.	2.69	1.34	Sometimes	Medium Level of Anxiety
9. I am afraid of taking a math pop quiz.	3.11	1.21	Sometimes	Medium Level of Anxiety
10. I am afraid of learning my math grade	3.08	1.40	Sometimes	Medium Level of Anxiety
11. I misunderstand concepts in math courses.	3.21	.95	Sometimes	Medium Level of Anxiety
12. I struggle to study well for math exams because I worry about my grade.	3.20	1.29	Sometimes	Medium Level of Anxiety
13. Looking at the pages of my math book makes me fear failing the test.	2.69	1.22	Sometimes	Medium Level of Anxiety
14. Even though I think a salesman made a mistake about the amount of my charge, I cannot object, since I will not be able to make the calculations while somebody is watching me	2.47	1.18	Rarely	Medium Level of Anxiety
15. I feel anxious while waiting for my math exam results	3.57	1.26	Frequently	High Level of Anxiety
16. I panic when I cannot remember a required equation for a problem	3.71	1.12	Frequently	High Level of Anxiety
17. When I think about the subjects required for passing a math course, I feel I cannot complete my school requirements.	3.09	1.29	Sometimes	Medium Level of Anxiety
18. I do not enjoy working with numbers.	2.97	1.29	Sometimes	Medium Level of Anxiety
19. I feel nervous when a friend notices that I didn’t understand a math solution.	2.88	1.22	Sometimes	Medium Level of Anxiety
Overall Mean	3.05	.79	Sometimes	Medium Level of Anxiety

Legend: Low Level of Anxiety (1.00 – 1.80); Medium Level of Anxiety (1.81 – 3.40); High Level of Anxiety (3.41 – 5.00)

Table 1 shows the descriptive statistics of the Perceived Level of Mathematics Anxiety of Grade 10 Students. As seen in the table, the highest mean score observed was Statement 1, “I feel relieved when a friend is chosen to answer a math question instead of me,” and it received a mean score of 4.01 (High Level of Anxiety). Meanwhile, statement 5, “Holding a math textbook to study gives me a stomachache,” obtained the lowest mean score of 1.89 (Medium level of Anxiety). The overall mean score of all the statements is 3.05, which indicates that the grade 10 students at Saint Mary’s University Junior High School and Science High School have a Medium Level of anxiety.

The results suggest that students’ anxiety is situational rather than constant. The presence of specific high anxiety is triggered by a certain situation involving mathematics, such as being asked to answer in class, which triggers a high level of anxiety. However, the medium level of anxiety is manifested in a situation where students do not reject mathematics altogether. Still, it affects their confidence and comfort in doing the task being assigned to them. This lack of confidence may lead to feelings of discouragement and heightened anxiety, particularly when students are unaware of the gaps in their understanding.

This result is consistent with the findings of Guo and Liao (2025), who reported that students exhibit a greater state of anxiety under exam preparation conditions compared to daily practice settings. This means that anxiety responses in specific situations are distinct from a persistent trait that occurs only when there is involvement in something they feel reluctant to do. Similarly, research by Sorvo et al. (2022) discovered that math anxiety demonstrates situational interactions with performance, particularly anxiety response, causing worse performance skill level during difficult tasks. These two studies imply that mathematical anxiety should be viewed as both a dynamic reaction brought on by certain school-related demands and an established emotional tendency.



Table 2. Comparison of the Perceived Level of Mathematics Anxiety of Grade 10 Students in terms of Sex

Variable	Groups	f	Mean	SD	t-value	p-value
Sex	Male	31	2.94	.78	-1.01ns	.314
	Female	44	3.12	.79		

ns/Not significant ( $p > 0.05$ )

Table 2 presents the comparison of mathematics anxiety levels between male and female Grade 10 students. The results show that the computed p-value of 0.314 indicates that the difference is not statistically significant ( $p > 0.05$ ). This suggests that there is not enough difference between male and female students' anxiety levels to make any significant implications.

The results suggest that mathematics anxiety among Grade 10 students is not significantly affected by sex. This means that male and female learners tend to experience mathematics anxiety at almost the same levels, and the small differences observed in their mean scores are not strong enough to suggest any real pattern. In other words, being male or female does not determine how anxious a student feels toward mathematics, since both groups show comparable levels of worry and stress when dealing with the subject. Therefore, this shows that math anxiety is a problem that all students face, regardless of their sex, highlighting that it is influenced more by academic and learning factors than by sex itself.

Recent studies support this finding. For instance, Levy et al. (2023) investigated how sex and math anxiety relate to career preferences among students. They found that during high school, sex did not predict levels of math anxiety. Still, instead, math anxiety itself, regardless of sex, was what shaped students' inclination toward or away from math-intensive careers. This underscores that sex does not significantly influence math anxiety in secondary school learners, reinforcing the view that interventions should target universal influences like teaching methods, learning environment, and study habits rather than focusing on gender differences.

Table 3. Comparison of the Perceived Level of Mathematics Anxiety of Grade 10 Students in Terms of Curriculum Type

Variable	Groups	f	Mean	SD	t-value	p-value
Curriculum Type	Regular	39	3.24	.73	2.35*	.021
	Science	36	2.83	.80		

\*Significant ( $p > 0.05$ )

Table 3 presents the comparison of the perceived level of mathematics anxiety of Grade 10 students in terms of curriculum type. The table shows that the computed t-value is 2.35 with a p-value of 0.021, indicating that there is a significant difference in the perceived levels of mathematics anxiety of students according to curriculum type. Students under the regular curriculum with  $M = 3.24$  and  $SD = 0.73$  reported higher levels of mathematics anxiety, while students from the Science Curriculum with  $M = 2.83$  and  $SD = 0.80$  reported lower levels of mathematics anxiety. This means that the difference that occurred in the perceived level of mathematics anxiety of grade 10 students according to curriculum type is unlikely due to chance.

This result implies that JHS science students likely receive specialized subjects and instruction, allowing them to be more advanced, which may reduce their anxiety levels compared to regular students who only focus on the standard curriculum. The students from the regular curriculum appear to encounter higher levels of anxiety, which could be linked to differences in exposure to mathematical concepts, instructional strategies, or academic expectations. In contrast, Science Curriculum students, who are generally more engaged with mathematics-related content, may develop greater familiarity and confidence with mathematical tasks, potentially reducing their anxiety.

These findings are consistent with previous research showing that curriculum design and exposure to mathematical content can shape students' levels of mathematics anxiety. For example, Passolunghi et al. (2016) found that students with greater and more continuous engagement in mathematics tended to report lower anxiety, as familiarity and practice help build confidence and reduce negative emotional responses. In a study of secondary school students in Qatar, Megreya and Al-Emadi (2023) found that students enrolled in Arts track curricula reported significantly higher levels of both math anxiety and science anxiety compared to those in Sciences track curricula, regardless of gender. The authors suggest that the structured and repeated exposure to mathematical and scientific content inherent in the Sciences curriculum may help reduce anxiety over time.

Table 4. Comparison of the Perceived Level of Mathematics Anxiety of Grade 10 Students in terms of Academic Standing

Variable	Groups	f	Mean	SD	F-value	p-value
Academic Standing	With High Honors	2	2.58	.11	.43ns	.735
	With Honors	32	2.98	.85		
	With Academic Distinction	3	3.02	1.10		
	None	38	3.13	.74		

ns/Not significant ( $p > 0.05$ )

Table 4 shows the comparison between the perceived level of mathematics anxiety of Grade 10 students when grouped according to their academic standing. The result shows no significant difference in mathematics anxiety across academic standings with p-value = 0.735 ( $p > 0.05$ ). This indicates that students' anxiety levels do not vary significantly across academic standing.

This result implies that mathematics anxiety is not closely connected to students' academic standing. This means that even students



who achieve high grades and receive honors can still feel anxious in mathematics, just like those who do not receive any recognition. Academic standing may show how well students perform in school, but it does not fully reflect their feelings or emotional struggles in learning math. In other words, math anxiety is something that all students can experience, whether they are considered high achievers or not. This suggests that mathematics anxiety is a common emotional experience among students, rather than one determined solely by academic performance.

More recent findings back this up. According to the study of Finell et al. (2022), math anxiety significantly affects performance through its impact on working memory, suggesting that ways to help lower anxiety could benefit students across all academic groups. Similarly, Sammallahti et al. (2023) found through a meta-analysis that structured anxiety-reduction strategies, including positive classroom environment and tangible support, can help improve mathematical outcomes regardless of a student's prior academic standing. These findings emphasize that improving mathematics learning environments benefits all students, whether they have high academic distinction or none.

Table 5. Comparison of the Perceived Level of Mathematics Anxiety of Grade 10 Students in terms of Mathematical Performance

Variable	Groups	f	Mean	SD	F-value	p-value
Mathematical Performance	Outstanding	23	2.72 <sup>A</sup>	1.00	3.55*	.019
	Very Satisfactory	31	3.05 <sup>AB</sup>	.71		
	Satisfactory	17	3.31 <sup>AB</sup>	.70		
	Fairly Satisfactory	4	3.80 <sup>B</sup>	.80		

\*Significant (p<0.05) Legend: Mean groups that do not share a common letter are significantly different from each other.

Table 5 shows the Comparison of the Perceived Level of Mathematics Anxiety of Grade 10 Students in Terms of Mathematical Performance. As shown, students who have Fairly Satisfactory performance got the highest mean of 3.80. Meanwhile, students who rated Outstanding got the lowest mean score of 2.72. With a p-value less than 0.05 (p<0.05), the result shows that there is a significant difference in the perceived levels of mathematics anxiety between particular levels of mathematical performance. The post hoc analysis revealed that the significant difference lies specifically between the Fairly Satisfactory group, with a mean = 3.80, and the Outstanding group, with a mean = 2.72, where students with Fairly Satisfactory performance experience significantly higher mathematics anxiety compared to those with Outstanding performance.

The result indicates that as students' mathematical performance increases, their anxiety level decreases and vice versa. It also suggests that students' performance is affected by their anxiety. Students who have an Outstanding performance often feel more capable, boosting their confidence and mastery of the subject, reducing the feelings of fear in dealing with math. On the other hand, students who perform poorly develop a higher level of anxiety, causing them to doubt, hindering their ability to learn effectively. This may be caused by having past experiences, such as repeatedly making the same mistakes when answering math problems.

This result is consistent with the findings of Barroso et al. (2021), wherein they discovered a relationship between math anxiety and performance, suggesting that as students' achievement gets lower, this will link to the development of higher math anxiety levels. Similarly, the study of Cipora et al. (2024) states that mathematics anxiety has a negative influence on student attitudes, such as self-efficacy and self-concept. In addition, it limits their arithmetic ability. Therefore, anxiety might set off an endless cycle of avoidance behaviors in any math-related activity, resulting in decreased performance and less confidence in their mathematical skills.

Table 6. Relationship Between the Perceived Level of Mathematics Anxiety and Mathematical Performance of Grade 10 Students

	Pearson's r	p-value	QD
Perceived Level of Mathematics Anxiety ↔ Mathematical Performance	-0.388*	0.001	Moderately Low Negative Correlation

Legend: Pearson r qualitative description—±0.80–±0.99: Very High Correlation; ±0.60–±0.79: Moderately High Correlation; ±0.40–±0.59: High Correlation; ±0.20–±0.39: Moderately Low Correlation; ±0.01–±0.19: Very Low Correlation; \*Significant (p < 0.05). \*

Table 6 presents the relationship between the perceived level of mathematics anxiety and mathematical performance among Grade 10 students. Based on the gathered data, the relationship between the two variables exhibits a moderately low negative correlation (r = -0.388).

This finding suggests that higher levels of mathematics anxiety are linked to slightly lower mathematics performance, although the correlation is not strong. The moderately low negative correlation means that when students feel more anxious, their performance usually becomes lower because their focus and ability to solve problems are affected. Still, since the connection is only moderately low, this also shows that math anxiety is not the only reason for differences in performance. Other factors, such as prior knowledge, study habits, confidence, and the way lessons are taught, also play an important part. This means that math anxiety adds to the difficulties students face in mathematics, but it does not fully explain why some students perform better than others.

Similarly, Finell et al. (2022) state that math anxiety diminishes working memory capacity, which is an essential resource for complex mathematical reasoning. Likewise, Caviola et al. (2022) identify working memory as a critical moderator. Students with stronger



working memory skills are less susceptible to the negative performance effects of anxiety. On the other hand, Tapola et al. (2025) emphasized that programs that improve both memory skills and emotional control help anxious students do better in math. Furthermore, Doz et al. (2024) found that boosting resilience and self-regulation helps students convert anxious feelings into productive engagement rather than avoidance.

Table 7. *Thematic Analysis of Suggestions to Improve the Mathematical Performance and Reduce the Mathematics Anxiety of the Grade 10 Students*

Theme/s	Sample Responses	f(n=41)	%
Peer Tutoring and Collaborative Support	“A tutoring program could be effective wherein each student who needs help will be taught in one-on-one discussions or through an online help desk to help students ask questions.” “I think a tutoring program could be effective wherein each students who needs help will be taught on one on one discussions or an online help desk to help students ask questions.” “Probably a tutor session with a fellow who understands math since teachers are busy and also sometimes lil awkward to talk to. A friend who’s good at math should teach those who isn’t”	19	25.3
Interactive, game-based and real-life learning	“Using math problems or puzzles as students’ entry pass and exit pass with their classes. This can help them become better with math without feeling anxious.” “To help students with Math anxiety, activities like math games, real life application and step-by-step practice can be useful. Group work tutoring, and supporting feedback also build confidence.” “Help students with math anxiety with activities like math games, real life application and others.”	12	16.0
Practice, Repetition, and Recall	“Practicing more exercises, asking questions in class and studying with my classmates can help students feel less nervous in math. It builds confidence because they get used to solving problems.” “Always practice solving problems and reviewing the previous lessons so that the next topics become easier to understand.” “Always recall the math lessons the next day to remember the lessons”	11	14.7
Supportive and Effective Teaching	“In my opinion a patient math teacher is what we need; moreover, we also need an appropriate teacher.” “Letting us students copy before teachers explain, some students can't write down notes while listening. Also taking things slow and citing lots of examples.” “Tutor programs or review sessions with teachers during free time”	9	12
Independent Learning and Study Habits	“By having organized notes in your notebook and reviewing ahead so that you won't worry about what's the next lesson and by also staying calm.” “I think other students could ask questions during discussion so that they don't get confused or ask a friend if they're too nervous to ask the teacher. They could also try solving some math exercises to try and apply what they learned.” “Do note-taking and have good study habits”	8	10.7
Confidence-Building	“Relaxation exercises in between math class helps calm anxiety that improves focus, and pairing students with peers to do math games can create a less intimidating learning space and reduces pressure.” “For me the best they can do is to think positively, avoid negative thoughts and stay calm.” “Taking deep breaths or short breaks helps me more supported”	7	9.3
Digital and Technology-Based Learning	“Practicing with apps or websites that makes math less scary.” “Utilizing video presentations or tutorials in math to improve math skills and gain more confidence in my mathematical abilities.” “Watch a YouTube strategies about the math lesson and you would feel more confident in math”	5	6.7
Simplified Curriculum and Assessments	“Remove the complex math situations and equations, since we only need the basics in real life situations.” “Math is a hands-on subject, so I'd suggest activities that bombard the student with problems and to reduce anxiety, it must not be recorded, just extra points or simply practice.” “More easier non graded questions or relate methods to previous lessons back on previous grades or take it slow and explain in greater detail the more complex lesson so students won't have a problem with catching up also please better handwriting for some teachers that's another plug problem some students struggle when listening while also note taking and notes because you have to understand the lesson first which makes it a big problem with multitasking also acknowledge that some students might get tired after a while during math class”	4	5.3

Table 7 presents the thematic analysis of suggestions from Grade 10 students on how to improve mathematical performance and reduce mathematics anxiety. As shown in the table, Peer Tutoring and Collaborative Support recorded the highest frequency of 19 (25.3%), followed by Interactive, Game-Based, and Real-Life Learning with 12 (16.0%), and Practice, Repetition, and Recall with 11 (14.7%). This indicates that students most commonly prioritize learning with peers, engaging activities tied to real contexts, and consistent practice.

The results indicate that students see peer tutoring as the most effective way to improve their mathematical performance and lessen anxiety since it allows them to learn with classmates who can explain lessons in simple and relatable ways. Moreover, this shared learning experience helps reduce stress and makes problem-solving more manageable. In addition, interactive and game-based learning



activities also play an important role, as they make mathematics more engaging and easier to connect with real-life situations, which can lessen feelings of fear and boredom. Furthermore, practice and repetition support these approaches by helping students strengthen their memory, improve accuracy, and feel more confident during assessments. Altogether, these findings show that students value collaboration, active engagement, and consistent practice as key to improving their overall experience in mathematics.

These findings are supported by the study of Moliner and Alegre (2020), wherein they found that peer tutoring significantly lowered students' mathematics anxiety in middle school. Another study from them in that same year further showed that the same approach boosted students' confidence and self-concept in mathematics. Meanwhile, Hidayat et al. (2023), through a systematic review, confirmed that peer tutoring consistently leads to improved mathematics learning outcomes across different contexts, demonstrating its broad effectiveness. Beyond peer tutoring, Hii and Mahmud (2023) reported that game-based learning in mathematics not only improves students' cognitive skills but also enhances their motivation and engagement, which can help in reducing anxiety. Likewise, Pizzie and Kraemer (2023) highlighted that consistent study practices, such as reviewing and practicing mathematical problems, help students mitigate the negative effects of anxiety on performance.

Table 8. *Thematic Analysis on Particular Math Topics and Activities that Make Grade 10 Students Anxious*

Theme/s	Sample Responses	f(n=75)	%
Geometry and Shapes	"Geometry because I struggle to determine which angle or side I need to find." "Geometry proofs confused me because they feel complicated and strict." "Yes, geometry because I get confused"	16	21.4
Trigonometry and Related Concepts	"Trigonometry feels overwhelming because I mess up formulas." "Trigonometry because of its rules that are easily forgettable." "Trigonometry concepts are hard"	14	18.6
Problem Solving and Word Problems	"Problem solving because it is hard for me to analyze the problems." "Word problems cause anxiety as they require translating stories into equations Which can be hard for me who are good at calculations but struggle with interpreting a question" "Yes word problems are hard."	13	17.3
All Math Topics (General Anxiety)	"All because I get really scared working with numbers." "All because I understand much sometimes but I forgot it at the same time" "All because I cannot memorize all of the steps on solving and their formulas"	9	12.0
None / No Specific Topic	"I don't think there's specific math topics or lessons that cause me to feel anxious sometimes I only feel this when my teachers gives a call and don't even know the answer" "Nothing really that is too tense for me, I can understand lessons well but in a slow and steady way." "Not really. There are no specific math topics or lessons that cause me to feel anxious it's just that I'm not that confident with myself sometimes."	8	10.7
Algebra and Polynomials	"Yes, algebra and word problems because they are sometimes hard to understand." "I feel most anxious with fractions, algebra, and timed tests." "Yes, algebra trigo and many more"	7	9.3
Fractions	"No, not really, but when it comes to fractions I don't get any of the lessons." "I feel most anxious with fractions." "Yes, fractions are really hard"	3	4
Long/Complex Equations	"Yes, the ones with long formula to answer because sometimes the teacher is too fast." "Long equations." "Any law formulas or solutions"	3	4
Functions, Equations & Logarithms	"Specific math topics that cause me anxiety are symmetry of functions." "Functions, logarithms, trigonometry, statistics, etc."	2	2.7

Table 8 presents the thematic analysis of specific mathematics topics that make Grade 10 students anxious. As shown in the table, Geometry and Shapes recorded the highest frequency of 16 (21.4%), followed by Trigonometry with 14 (18.7%), and Word Problems with 13 (17.3%). This indicates that students most commonly experience anxiety when dealing with geometry, trigonometry, and word problems.

The results indicate that students feel the most anxiety around geometry because this topic demands strong spatial reasoning and visual representation, which many find challenging. Similarly, trigonometry follows closely, since it involves abstract formulas and connections to geometric concepts. Moreover, word problems also cause considerable stress, as they require learners to interpret scenarios and translate them into mathematical expressions, an effort that increases cognitive strain. Taken together, this pattern shows that math anxiety tends to surface most when topics involve abstract reasoning, visualization, and several reasoning steps.

Recent studies strongly support these findings. Daker et al. (2022) demonstrate that spatial reasoning anxiety is particularly tied to performance in spatial tasks such as geometry, confirming why students find geometry especially anxiety-inducing. Meanwhile, Aminudin et al. (2019) qualitatively explored students' errors in trigonometry and revealed that the subject's abstract nature, complex terminology, and conceptual confusion cause many students to struggle and feel anxious about trigonometry. On the other hand, Doz et al. (2023) demonstrate that the necessity to interpret a narrative, extract relevant data, and convert it into structured mathematical

expressions significantly increases cognitive load and triggers anxiety. Altogether, these studies validate why geometry, trigonometry, and word problems stand out as the most anxiety-inducing topics in mathematics.

## Conclusions

In general, this study showed that mathematics anxiety has a significant relationship with the mathematical performance of Grade 10 students at Saint Mary's University Junior High School and Science High School. The findings revealed that students generally exhibit a medium level of mathematics anxiety, which suggests situational rather than constant anxiety that arises particularly when students are called upon in class or placed in evaluative situations. Significant differences were observed between curriculum types and mathematical performance levels, wherein students from the regular curriculum and those with fairly satisfactory performance reported higher anxiety compared to those from the science curriculum and those with outstanding performance. This implies that students with less exposure to advanced mathematics may experience greater anxiety. In addition, the study revealed a moderately low negative correlation between mathematics anxiety and mathematical performance, suggesting that while anxiety affects performance, it is not the sole determining factor. Moreover, students identified geometry, trigonometry, and word problems as the most anxiety-inducing topics and activities and recommended peer tutoring, interactive learning, and consistent practice as effective interventions. Despite these insights, the study's limitations include its focus on a single institution and reliance on self-reported measures.

Nevertheless, it contributes a valuable understanding of the localized nature of mathematics anxiety in the Philippine context and addresses gaps in how anxiety manifests in specific educational settings. Furthermore, the study proved effective in capturing both quantitative patterns and qualitative insights, thereby offering a more comprehensive understanding of the phenomenon. Overall, the findings emphasize the importance of early identification of math-anxious students and the creation of supportive, engaging, and less intimidating classroom environments. They also suggest that mathematics anxiety is a multifaceted issue shaped by curriculum design, performance levels, and specific content areas. Consequently, educators may implement targeted and differentiated instruction to reduce anxiety and improve outcomes, while future research may involve larger and more diverse samples to test intervention programs aimed at enhancing mathematical performance.

With the significant findings of this study, the researchers suggest the following recommendations:

Saint Mary's University Junior High School and Science High School can use this study as a basis to establish a peer tutoring program to support collaboration in math learning. They can also reduce anxiety and increase engagement by using interactive, game-based, and real-life application activities in math classes. Moreover, regular low-pressure formative assessments should also be used to build student confidence.

Institutions in general could recognize that math anxiety affects all students and provide support addressing both cognitive and emotional needs. Hence, curriculum design may ensure balanced exposure to math concepts among all students. Also, feedback mechanisms may be needed to enhance teaching methods and provide more targeted support. Teachers may consider adopting collaborative teaching and peer learning approaches to create a more supportive environment. Furthermore, special attention could be given to high-anxiety topics such as geometry, trigonometry, and word problems by using visual aids and step-by-step strategies. Finally, student performance could be strengthened through consistent practice and the use of positive reinforcement.

Students could actively seek peer support and join study groups. In addition, consistent practice in challenging areas can improve familiarity and reduce anxiety. Finally, they should communicate their struggles with teachers to receive proper support and accommodations. Future research could expand to larger and more diverse junior high samples for better generalization. It may also focus on high-anxiety topics and activities like geometry, trigonometry, and word problems, explore teaching methods such as peer tutoring, game-based learning, and active recall, and assess coping strategies like relaxation, self-talk, or group study. Moreover, testing intervention programs and integrating factors such as self-efficacy, motivation, and learning styles could provide a more holistic view of mathematics anxiety and achievement.

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