

Mathematics Anxiety, Attitudes Towards Mathematics, and Academic Performance of the Senior High School Students in Katipunan I District, Schools Division of Zamboanga DelNorte

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Abstract: This study aimed to determine the mathematics anxiety, attitudes towards mathematics, and how they affect the students' academic performance in Katipunan I District, Schools Division of Zamboanga del Norte, during the first semester of the school year 2025-2026. It employed a descriptive-correlational research design. There were two hundred nine (209) respondents involved. Weighted mean, standard deviation, and Spearman Rank-Order Correlation Coefficient were the statistical tools used with JAMOV as the statistical software. The study revealed that the level of mathematics anxiety of the respondents was average. The respondents' attitudes towards mathematics were moderate. The level of academic performance of the respondents was satisfactory. There existed a significant medium/moderate negative correlation between the levels of mathematics anxiety and academic performance. There existed a significantly small/low positive correlation between the levels of attitudes towards mathematics and academic performance. Based on the findings, the author recommends that the DepEd Key Officials, through the Human Resource Development and Mathematics Supervisor, use the findings of this study as input to the training programs for teachers to reduce, if not eliminate, mathematics anxiety and increase academic performance. The school heads would use the findings of this study in their periodic instructional supervision and provision of technical assistance to mathematics teachers. The teachers would also benefit from the findings of this study as a basis for reflection in the delivery of mathematics instruction and to make mathematics learning enjoyable.

Keywords: *mathematics anxiety, attitudes towards mathematics, academic performance, department of education, Katipunan I District*

I. Introduction

Education is vital to national development in the Philippines, yet mathematics anxiety continues to limit learning among senior high school students. This issue is more evident in rural districts like Katipunan I in Zamboanga del Norte, where instructional resources are limited. In PISA 2022, the Philippines scored an average of 355 in mathematics, indicating only minimal improvement from its previous performance (OECD, 2023). Filipino learners perform below proficiency in mathematics, indicating weak problem-solving skills and low confidence. Studies confirm that higher mathematics anxiety leads to poorer academic performance among senior

high school students (Estonanto, 2022). Positive attitudes confidence, enjoyment, and valuing math are strong predictors of achievement (Concha, 2025; Macaso & Dagohoy, 2022).

Additionally, research indicates that students' academic performance is highly predicted by their attitudes and anxiety levels in mathematics, with high anxiety levels frequently resulting in avoidance behaviors and poor performance (Harun et al., 2022). In light of these interconnected elements, investigating the connection between academic performance, attitudes, and mathematical anxiety is crucial to developing successful interventions and teaching methods.

Poor academic performance have been associated with mathematics anxiety, particularly in senior high school students making the switch to increasingly complicated mathematical topics (Ramirez et al., 2018). Students' involvement and success in learning mathematics are also greatly influenced by their attitude toward the subject, which encompasses their beliefs, interests, and emotional reactions to it (Zhu, & Chiu, 2019). Based on the research, students who have a favorable attitude toward mathematics typically outperform those who have a negative opinion (Mohd Nordin et al., 2021).

While previous studies have explored the effects of mathematics anxiety and attitudes towards mathematics on students' academic performance, most have been conducted in urban centers or higher education settings, leaving rural contexts such as Katipunan I District in Zamboanga del Norte underrepresented. This gap is important because rural students often face distinct challenges, including limited access to quality learning resources, socio-economic constraints, and cultural perceptions of mathematics, which may intensify anxiety and shape attitudes differently compared to urban peers. Without localized research, interventions and teaching strategies may fail to address the specific needs of these learners. By examining the interplay of mathematics anxiety, attitudes, and performance among senior high school students in Katipunan I District, this study will provide context-sensitive insights that can guide educators, school leaders, and policymakers in designing targeted support systems. In doing so, it contributes to the existing body of knowledge by extending theoretical and empirical findings into a rural Philippine setting, thereby enriching the global discourse on mathematics education with data that reflects diverse learning environments.

II. Literature Review

Mathematics Anxiety

Research in the Philippines shows that senior high school STEM students, especially those taking pre-calculus or calculus, often feel moderate to high levels of mathematics anxiety. Rabuya (2023) revealed that in Tacloban City, STEM students expressed moderate anxiety, with important variables including surprise quizzes, test pressure, and low self-confidence. There was no significant gender difference noted. Estonanto (2017) found that 77% of STEM students at Sorsogon State College experienced math anxiety and 41% did badly in pre-calculus, indicating a negative correlation between anxiety and academic performance (Estonanto, 2017). Furthermore, Ongcoy et al. (2023) investigated Pikit National High School STEM students and discovered that pleasant teacher-student interactions and favorable mathematics content experiences were strongly associated with lower levels of math anxiety (Ongcoy et al., 2023).

The Revised Mathematics Anxiety Rating Scale was used to measure mathematics anxiety in Vietnamese high school students. They discovered that gender, career goals, grade, and present math proficiency all strongly influenced MA levels; for example, students in Grade 12 and those pursuing industrial engineering, finance, or economics reported higher levels of anxiety. It's interesting to note that students who performed better also showed higher levels of anxiety, indicating a complicated relationship between pressure to succeed and potential career paths (Luu-Thi et al., 2021). Behavioral indicators of mathematics anxiety in high school pupils who are not making much progress. They discovered three behaviors: counting out loud, randomly separating or connecting number fragments, and gaze diversion or distraction during math tasks that are associated with higher mathematics anxiety using observational coding and multiple linear regression. These overt behavioral patterns can act as early indicators of anxiety, providing opportunities for intervention before the condition worsens and affects academic performance (Chen et al., 2023).

Attitudes Towards Mathematics

Attitudes toward mathematics influence students academic performance, particularly among senior high school (SHS) students. Sabanal et al. (2024) discovered that positive attitudes—such as believing mathematics is useful and being confident in one's ability to solve problems—were significantly associated with higher mathematics achievement among Grade 11 students in the new normal learning setup. The researchers concluded that positive emotional dispositions, such as enjoyment and motivation, improved student involvement and test performance. Similarly, Tagacay (2024) discovered that in a modular distance learning context in Iloilo, Grade 11 students with positive attitudes about mathematics consistently outperformed their counterparts with negative attitudes on math-related examinations. This lends support to the notion that, in addition to content knowledge, learners' beliefs and emotional responses to mathematics are important predictors of success.

Academic Performance

Numerous psychosocial and environmental factors affect the academic performance of Filipino children. David et al. (2021) assert that familial engagement and parental support substantially improve academic performance by cultivating drive and discipline. Garcia et al. (2019) asserted that kids who obtain emotional and academic support from their parents are likely to cultivate more robust study habits and enhanced confidence, resulting in improved academic performance. Santos et al., (2020) discovered that a supportive home environment, defined by structure and limited distractions, is essential for maintaining academic concentration, particularly in online and mixed learning contexts.

Ramos et al. (2020) stated that innovative teaching strategies, including humour and inquiry-based learning, markedly enhanced students' comprehension and retention. Similarly, Alcaraz et al. (2022) shown that teacher-student relationships founded on mutual respect and transparent communication are favorably associated with academic engagement and success. Moreover, Morales et al. (2021) emphasized the significance of prompt and constructive feedback, which aids students in recognizing their learning deficiencies and improves their academic performance over time.

Conceptual Framework

The conceptual framework is presented in Figure 1. Part I includes the independent variables, the Mathematics Anxiety with twenty (20) items, and attitudes towards mathematics with seven (7) items. Part II presents the dependent variable, which is the students' academic performance. This is measured based on the grading system outlined in DepEd Order No. 8, Series of 2015, using the first-quarter grades of the first semester for the school year 2025–2026 as provided by the class adviser.

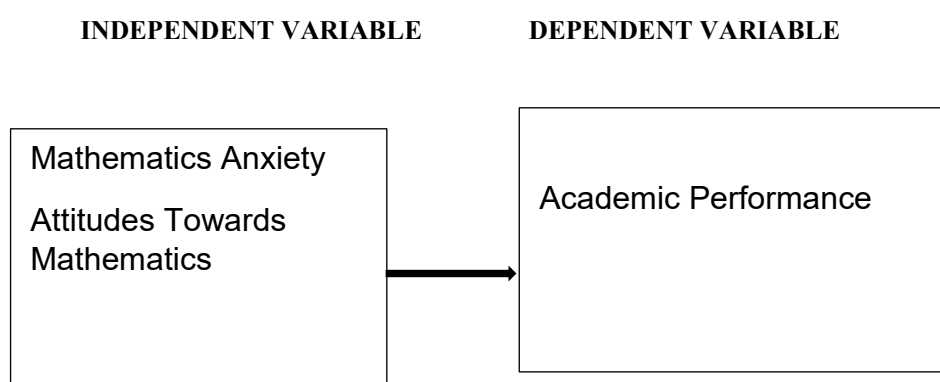


Figure 1. Conceptual Framework of the Study

Statement of the Problem

This study aimed to determine the mathematics anxiety, attitudes towards mathematics, and how they affect the students' academic performance in Katipunan I District, Schools Division of Zamboanga del Norte during the first semester of the school year 2025-2026.

Specifically, it seeks to answer the following questions:

1. What is the respondents' perceived level of mathematics anxiety?
2. What is the respondents' perceived level of attitudes towards mathematics?
3. What is the respondents' level of academic performance?
4. Is there a significant relationship between mathematics anxiety and academic performance?
9. Is there a significant relationship between attitudes towards mathematics and academic performance?

Hypotheses

1. There is no significant relationship between mathematics anxiety and academic performance.
2. There is no significant relationship between attitudes towards mathematics and academic performance.

II. Research Methodology

Method Used

The study utilized survey and descriptive-correlational research methods. The researchers utilized the survey method to collect data on mathematics anxiety, attitudes towards mathematics, and academic performance through a questionnaire. A survey is a research method described by Check & Schutt (2012), as a collection of information from a sample of individuals through their responses to questions. Bhandari (2021) described correlational research as "the systematic investigation of relationships among two or more variables, without any experimental manipulation of those variables. Correlational research is a non-experimental method where a researcher measures variables and evaluates the statistical relationship between mathematics anxiety, attitudes towards mathematics, and academic performance without interference from other variables.

Research Environment

The study is conducted in Katipunan, Zamboanga del Norte, particularly in Bulawan Integrated School, Gonzalo Reinante National High School and Katipunan National High School, Katipunan I District.

Respondents of the Study

The respondents of this study were the Grade 11 students from Bulawan Integrated School, Gonzalo Reinante National High School, and Katipunan National High School located in the Katipunan District, Schools Division of Zamboanga del Norte. To determine the appropriate sample size, the researcher utilized the Raosoft sample size calculator. Furthermore, stratified sampling was employed to ensure proportional representation of respondents across the two grade levels.

Research Instrument

The questionnaire used in the study consisted of two main parts. **Part I** measured Mathematics Anxiety and was adopted from Bornaa et al. (2023), consisting of twelve (12) items. **Part II** assessed Attitudes Toward Mathematics and was adapted from Wangdi (2023), consisting of seven (7) items. In addition to the questionnaire, **Academic Performance** was measured using the students' actual general average for the first quarter of S.Y. 2025–2026, as obtained from the registrars of the three participating schools. The scoring procedure for each component is presented below.

Scoring Procedure

Mathematics Anxiety

Scale	Range of Values	Description	Interpretation
5	4.21-5.00	Strongly Agree	Very High
4	3.41-4.20	Agree	High
3	2.61-3.40	Somewhat Agree	Average
2	1.81-2.60	Disagree	Low
1	1.00-1.80	Strongly Disagree	Very Low

Attitudes Towards Mathematics

Scale	Range of Values	Description	Interpretation
5	4.21-5.00	Strongly Agree	Very High
4	3.41-4.20	Agree	High
3	2.61-3.40	Somewhat Agree	Average
2	1.81-2.60	Disagree	Low
1	1.00-1.80	Strongly Disagree	Very Low

Students' Academic Performance

Scale	Range of Values	Description	Grading Scale
5	4.500-5.000	Outstanding	90 – 100
4	3.500-4.499	Very Satisfactory	85 – 89
3	2.500-3.499	Satisfactory	80 – 84
2	1.500-2.499	Unsatisfactory	75 – 79
1	Below 1.499	Poor	Below 75

Source: DepEd Order No. 8 series of 2015

Data Gathering Procedure

The researcher sought approval to administer the study's instrument by first submitting a request letter to the Dean of the Graduate School of Andres Bonifacio College, Inc., Dipolog City. The endorsed letter was forwarded to the Schools Division Superintendent of Zamboanga del Norte, and subsequently to the DepEd Research and Ethics Committee for ethics clearance. Upon approval, the ethics clearance was presented to the school principals and supervisor, granting permission to administer the questionnaire.

Statistical Treatment of the Data

Presented below are the statistical tools utilized in the treatment and analysis of the data gathered.

Weighted Mean. This is used to quantify the respondents' ratings on the mathematics anxiety, attitudes towards mathematics, and academic performance.

Standard Deviation. This is used to determine the homogeneity and heterogeneity of the respondents' scores, where $SD \leq 3$ is homogenous and $SD > 3$ is heterogeneous (Aiken & Susane, 2001; Refugio et al., 2019).

Spearman Rank-Order Correlation Coefficient (Spearman rho). This is used to determine the correlation between mathematics anxiety, attitudes towards mathematics, and academic performance. The following guide in interpreting the correlation value proposed by Cohen et al. (2014) was utilized in this study:

Value	Size	Interpretation
± 0.50 to ± 1.00	Large	High positive/negative correlation
± 0.30 to ± 0.49	Medium	Moderate positive/negative correlation
± 0.10 to ± 0.29	Small	Low positive/negative correlation
± 0.01 to ± 0.09	Negligible	Slight positive/negative correlation
1.0	No correlation	

IV. Results

Level of Respondents' Mathematics Anxiety

Table 1

Perceived Level of Respondents' Mathematics Anxiety

	AWV	SD	Description	Interpretation
1. I always feel relieved when not chosen to answer a question in a mathematics class.	3.18	1.17	Somewhat Agree	Average
2. I feel anxious when I start writing a mathematics test or exams.	3.25	1.06	Somewhat Agree	Average
3. I cannot ask any questions about what I did not understand in math class	2.83	1.25	Somewhat Agree	Average
4. I find it more difficult to learn mathematics than any other subject	3.20	1.18	Somewhat Agree	Average
5. I always worry that I will fail mathematics so I don't study it	2.62	1.31	Somewhat Agree	Average
6. I get nervous when I learn that the next lesson in mathematics	2.80	1.24	Somewhat Agree	Average
7. I panic when I am not able to recall a procedure for solving a mathematics question.	3.17	1.12	Somewhat Agree	Average
8. I find it difficult to understand concepts in mathematics	2.97	1.08	Somewhat Agree	Average
9. I cannot solve mathematics questions when somebody is watching me	2.74	1.34	Somewhat Agree	Average
10. I hate to look through mathematics textbooks	2.60	1.15	Disagree	Low
11. I do not like parts of other subjects that deal with mathematics	2.78	1.11	Somewhat Agree	Average
12. When I think about the frequently selected topics required for passing mathematics, I feel I cannot make it	3.05	1.08	Somewhat Agree	Average
13. I feel anxious while waiting for the result of a math exam	3.43	1.15	Agree	High
14. I am often late to a mathematics class because I feel uncomfortable during mathematics lessons	2.23	1.23	Disagree	Low
15. I am afraid of giving an answer in a mathematics class even if I know it	3.14	1.16	Somewhat Agree	Average

16. I cannot concentrate on anything again whenever I am to write a mathematics exam	2.79	1.05	Somewhat Agree	Average
17. I can reject helping a child with his/her homework because I am afraid of facing a question that I cannot solve	2.81	1.24	Somewhat Agree	Average
18. I feel anxious when sitting in class and waiting for the mathematics teacher	2.59	1.25	Disagree	Low
19 I can reject helping a child with his/her homework because I am afraid of facing a question that I cannot solve	2.88	1.29	Somewhat Agree	Average
20. I wish not to do a mathematics-related course in the university or college	2.84	1.35	Somewhat Agree	Average
Overall	2.90	1.03	Somewhat Agree	Average

AWV=Average Weighted Value, SD=Standard Deviation

Table 1 shows that the respondents obtained an overall weighted mean of 2.90 (SD = 1.03), verbally described as Somewhat Agree, interpreted as Average mathematics anxiety. This indicates that students moderately experience feelings of worry, tension, and discomfort toward mathematics. The highest anxiety was observed in item no. 13, “*I feel anxious while waiting for the result of a math exam*” (WM = 3.43, High), while low anxiety was noted on disliking textbooks and tardiness due to discomfort in mathematics classes. This that students do not exhibit extremely high fear of mathematics; however, they have consistent moderate levels of apprehension, particularly during assessment-related activities and situations requiring performance or recall of procedures. This suggests that their anxiety is situational rather than a strong overall dislike of mathematics. This implies that moderate anxiety may hinder students’ confidence, concentration, and willingness to participate, which could eventually affect their learning outcomes and mathematics performance. Hence, teachers may need to use supportive teaching strategies, such as confidence-building exercises, student-centered instruction, and reduced pressure during assessments, to minimize anxiety and encourage active engagement in mathematics. The present finding contradicts with the results of Cruz (2023), which reported that the level of mathematics anxiety among the students is above average and at a high level.

Level of Attitudes Towards Mathematics

Table 2

Perceived Level of Respondents’ Attitudes Towards Mathematics

	AWV	SD	Description	Interpretation
1. Learning mathematics is fun to me.	3.33	1.24	Somewhat Agree	Moderate
2. I enjoy talking to others about mathematics	3.05	1.11	Somewhat Agree	Moderate
3. If I had time, I would spend more time learning mathematics.	3.11	1.10	Somewhat Agree	Moderate
4. I feel that mathematics is not required for my future career.	2.77	1.26	Somewhat Agree	Moderate
5. Studying and working with mathematics does fear me.	2.85	1.15	Somewhat Agree	Moderate
6. Mathematics makes me feel uncomfortable and nervous	2.95	1.21	Somewhat Agree	Moderate

7. I love to work with friends while solving Mathematics questions.	3.54	1.31	Agree	High
Overall	3.09	1.09	Somewhat Agree	Moderate

Table 2 reveals that the respondents obtained an overall weighted mean of 3.09 (SD = 1.09), verbally described as Somewhat Agree, interpreted as having a Moderate attitude toward mathematics. This indicates that most students view mathematics as important and are willing to engage with it, although their interest is not strongly positive. The highest-rated item was “*I love to work with friends while solving Mathematics questions*” (WM = 3.54, Description: Agree, Interpretation: High), suggesting that students prefer collaborative learning. Meanwhile, statements related to fear, nervousness, and doubts about career relevance showed only moderate agreement, reflecting mixed feelings toward math. This means that the respondents exhibit a generally positive but not strongly enthusiastic attitude toward mathematics. They enjoy learning math when supported by peers, yet still experience mild discomfort and uncertainty about its importance in their future careers. This reflects a balanced perception: students do not reject mathematics but also do not strongly embrace it. The moderate attitude implies that students may become more motivated if given meaningful, interactive, and relevant learning experiences. Since the highest positive response focuses on collaboration, teachers may consider integrating peer tutoring, group problem-solving, and cooperative learning activities to strengthen motivation and engagement. Addressing students’ nervousness and misconceptions about the relevance of mathematics may further improve their perception and performance. The present finding diverges from the results of Wangdi (2023), who reported that a substantial majority of students (70%) strongly agreed that mathematics made them feel uncomfortable and nervous, highlighting the prevalence of negative emotions associated with the subject.

Level of Academic Performance

Table 3

Level of Respondents' Academic Performance

Scale	Range of Values		Description	Frequency	Percent	AWV	Description
1	below 75	1.00-1.80	Did not meet Expectation	1	0.48		
2	75-79	1.81-2.60	Fairly Satisfactory	49	23.44		
3	80-84	2.61-3.40	Satisfactory	85	40.67	3.27	Satisfactory
4	85-89	3.41-4.20	Very Satisfactory	40	19.14		
5	90-100	4.21-5.00	Outstanding	34	16.27		
Total				209	100.00		

Table 3 shows that most respondents fall within the Satisfactory performance level, with 85 students (40.67%) having grades ranging from 80–84. This is followed by the *Fairly Satisfactory* category, representing 49 students (23.44%), and the *Very Satisfactory* category with 40 students (19.14%). Only 16.27% (34 students) reached the *Outstanding* level (90–100). A very small percentage (0.48%) did not meet expectations. The overall academic performance has an Average Weighted Value (AWV) of 3.27, indicating an overall Satisfactory achievement. The results indicate that the respondents generally perform at an average level in academic performance, with a considerable number achieving satisfactory grades but fewer reaching very high or outstanding levels. While most students meet basic learning competencies, only a minority demonstrates exceptional proficiency in their academic performance. The prevalence of satisfactory performance suggests that

students may benefit from enhanced instructional support to transition from average to higher achievement levels. Schools may consider strengthening enrichment programs, differentiated instruction, and targeted remediation, especially for those at the lower achievement levels. Additionally, motivation and instructional strategies that promote critical thinking and problem-solving may be crucial in helping students reach outstanding performance. These findings align with the study of DepEd (2019), which reported that many Filipino learners meet expected competencies but lack mastery required for excellence due to gaps in instructional quality and learning support. Furthermore, the present finding oppose from the results of Wangdi (2023), who reported that students' performance in mathematics was generally low.

Relationship between Mathematics Anxiety and Academic Performance

Table 4

Test of the Relationship between Mathematics Anxiety and Academic Performance

	rho-value	p-value	Interpretation
Mathematics Anxiety vs Academic Performance	-0.339	< 0.01	medium/moderate negative correlation Significant

Table 4 presents a Spearman rho-value of -0.339 , with a p-value < 0.01 , indicating a significant moderate negative correlation between Mathematics Anxiety and Academic Performance. This means that higher levels of anxiety in mathematics are associated with lower academic performance, and vice versa. The result suggests that students who experience greater fear, worry, or tension when learning mathematics tend to perform less proficiently in the subject. Conversely, students who are less anxious are more likely to achieve higher academic outcomes. Thus, mathematics anxiety is a meaningful factor influencing students' performance. This finding highlights the importance of creating classroom environments that reduce anxiety and build confidence, especially during assessments. Teachers may adopt strategies such as supportive feedback, collaborative problem-solving, and anxiety-reduction activities to improve both emotional comfort and academic success in mathematics. School programs focusing on math readiness, counseling, and motivational approaches could further enhance performance by decreasing anxiety. This result is consistent with Cruz (2023), who found that mathematics anxiety interferes with working memory and problem-solving, resulting in lower performance.

Relationship between the Respondents' Attitudes Toward Mathematics and Academic Performance

Table 5

Test of Relationship between the Respondents' Attitudes Toward Mathematics and Academic Performance

	rho-value	p-value	Interpretation
Mathematics Anxiety vs Academic Performance	0.218	< 0.002	small/low positive correlation Significant

Table 5 shows a Spearman rho-value of 0.218 , with a p-value < 0.002 , indicating a significant but small positive correlation between students' attitudes toward mathematics and their academic performance. This means that although the relationship is weak, students who display more positive attitudes toward mathematics tend to achieve slightly higher academic performance. The findings suggest that students' perceptions, interests, and feelings toward mathematics exert some influence on their learning outcomes. While the effect is not strongly pronounced, those who enjoy and value mathematics are more likely to perform better than those with negative

or indifferent attitudes. Thus, attitude plays a supportive but not dominant role in determining academic performance. Since attitude has a measurable but modest impact on performance, educational interventions should promote motivation, relevance, and enjoyment in learning mathematics. Strategies such as real-life applications, engaging activities, and collaborative work may help foster positive attitudes. Enhancing students' confidence and appreciation of mathematics may gradually lead to improved academic outcomes. It implies that building positive learning experiences could strengthen performance over time. This result is supported by Capuno et al. (2019), who found that students with more favorable attitudes toward mathematics show better engagement and tend to perform higher academically. Further indicated that there is significant relationship between students' attitudes toward mathematics and their academic performance in the subject. These studies affirm that attitude, even at a small effect size, remains a relevant factor influencing students' mathematical performance.

V. Discussions and Recommendations

The overall findings of the study reveal three key insights concerning students' mathematics learning experience. First, the respondents exhibited average levels of mathematics anxiety, suggesting that while anxiety is not overwhelmingly high, it remains present in situations requiring assessment, problem recall, or classroom participation. Second, students displayed moderately positive attitudes toward mathematics, especially when engaging in collaborative work. They tend to enjoy mathematics more when learning with peers, although some discomfort and uncertainty persist regarding its usefulness for future careers. Third, the respondents' level of academic performance was generally satisfactory, with most students meeting expected competencies, though a smaller portion achieved outstanding performance. Those with higher anxiety tended to have lower grades, as evidenced by the significant moderate negative relationship between mathematics anxiety and academic performance. Conversely, a significant but low positive relationship existed between students' attitudes and their performance, showing that positive dispositions support achievement but are not the sole determinant. Taken together, the findings suggest that students' emotional and motivational dispositions toward mathematics can contribute to learning outcomes. While they are capable and adequately performing, reducing anxiety and improving attitudes may help elevate performance from satisfactory to higher performance.

Based on the findings of this study, it is recommended that teachers adopt classroom practices that help reduce students' mathematics anxiety while strengthening their interest in the subject. These include providing supportive feedback, scaffolding difficult tasks, using low-pressure assessments, and incorporating collaborative and real-life problem-solving activities that make learning more engaging and relevant. To support these efforts, school heads are encouraged to implement mathematics enrichment programs such as peer tutoring, math camps, and remedial sessions for students with high anxiety or low performance. They may also offer professional development for teachers that focuses on student-centered pedagogy, classroom climate, and motivation strategies specifically designed for mathematics instruction. Students, on the other hand, are encouraged to take active roles in peer learning opportunities, develop consistent study habits, and seek assistance from teachers or classmates when encountering difficulties. Lastly, future researchers may explore intervention-based studies that reduce mathematics anxiety or enhance attitudes toward mathematics, investigate other variables that may influence performance, such as teaching styles or parental involvement, or use mixed-method approaches to gain deeper insights into learners' mathematical experiences.

VI. Conclusions

The study concludes that Senior High School students generally possess an average level of mathematics anxiety and a moderately positive attitude toward mathematics, which together relate meaningfully to their academic performance. Although most students perform satisfactorily, higher levels of anxiety tend to lower achievement, while more favorable attitudes slightly contribute to better performance, indicating that emotional and motivational factors play a significant role in mathematics learning outcomes. The findings suggest that students are capable of meeting required competencies but could achieve higher levels of performance if their anxiety is reduced and their attitudes are further improved through supportive, engaging, and collaborative

learning environments. Overall, enhancing students' confidence and interest in mathematics may serve as a key pathway toward elevating their academic performance.

References

- [1] Aiken, L. S., & Susane, G. (2001). *West multiple progression*. Newbury Park, CA: SAGE Publishing.
- [2] Alcaraz, S. D., Gonzales, F. J., & Tan, M. E. (2022). *Teacher-student rapport and its relationship to academic motivation in senior high school*. Southeast Asian Educational Journal, 30(1), 78–92.
- [3] Capuno, R., Necesario, R., Etcuban, J. O., Espina, R., Padillo, G., & Manguilimotan, R. (2019). Attitudes, Study Habits, and Academic Performance of Junior High School Students in Mathematics. *International Electronic Journal of Mathematics Education*, 14(3), 547-561.
- [4] Chen, M. Y. K., Jamaludin, A., & Tan, A. L. (2023). Behavioural predictors of math anxiety in low-progressing elementary students. [Preprint]. [arXiv](https://arxiv.org/abs/2308.12345)
- [5] Cohen, G. L., & Sherman, D. K. (2014). *The psychology of change: Self-affirmation and social psychological intervention*. Annual Review of Psychology, 65, 333–371.
- [6] Concha, R. P. (2025). *Proficiency and attitude towards mathematics of senior high school students in relation to mathematics performance*. The Light Explorer.
- [7] Cruz, M. S., Navarro, D. T., & Villanueva, P. A. (2021). *Socioeconomic disparities and student performance during distance learning in the Philippines*. Journal of Development Education, 14(1), 34–48.
- [8] Cruz, R. A. D. (2023). Employability of Senior High School Technical-Vocational and Livelihood Graduates: Basis for Human Resource Management Enhancement Program. *East Asian Journal of Multidisciplinary Research*, 2(9), 3877-3892.
- [9] David, L. M., Cruz, M. R., & Reyes, J. F. (2021). *Parental involvement and student academic outcomes: A Philippine perspective*. Philippine Journal of Educational Studies, 45(2), 110–125.
- [10] Estonanto, A. J. J. (2022). *Math anxiety and academic performance in pre-calculus of selected senior high schools in Sorsogon State College*. Journal of Higher Education Research Disciplines.
- [11] Garcia, A. B., Mendoza, C. L., & Lim, R. J. (2019). *The impact of family dynamics on the academic performance of high school students in Metro Manila*. Journal of Social Science Research, 18(3), 90–102.
- [12] Harun, H., Ahmad, N., & Ismail, M. (2022). The impact of mathematics anxiety and attitudes on students' academic performance in mathematics. *Journal of Educational Psychology Research*, 12(3), 145–160. <https://doi.org/10.1111/jer.12345>
- [13] Luu-Thi, H.-T., Ngo-Thi, T. T., Nguyen-Thi, M. T., Thao-Ly, T. T., & Nguyen-Duong, B. T. (2021). An investigation of mathematics anxiety and academic coping strategies among high school students in Vietnam. *Frontiers in Education*, 6. [Frontiers](https://doi.org/10.3389/feduc.2021.789012)
- [14] Macaso, K. M. J., & Dagohoy, R. G. (2022). Predictors of Performance in Mathematics of Science, Technology And Engineering Students of a Public Secondary School in the Philippines. *Journal of Social, Humanity, and Education*, 2(4), 311-326.
- [15] Mohd Nordin, N. N., Vaithilingam, R. D., Saub, R., Nasir, N. H., Asari, A. S. M., Bashah, B., ... & Mohammad, N. M. (2021). Awareness, knowledge, attitudes and practices on the management of diabetes mellitus patients with periodontitis amongst Malaysian primary care practitioners. *Malaysian family physician: the official journal of the Academy of Family Physicians of Malaysia*, 16(3), 44.
- [16] Morales, J. B., Abad, C. R., & Lopez, H. A. (2021). *Feedback mechanisms in classroom instruction and their impact on student learning outcomes*. Philippine Normal University Research Journal, 17(2), 130–145.
- [17] Organization for Economic Co-operation and Development (OECD). (2023). *PISA 2022 Results (Volume I & II): Country Note – Philippines*. OECD Publishing.

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- [17] Rabuya, C. A. (2023). Factors related to mathematics anxiety among senior high school students in Basic and Pre-Calculus: A descriptive cross-sectional psychological study. *Journal for ReAttach Therapy and Developmental Diversities*, 6(9s), 183–190.
- [18] Ongcoy, P. J. B., Jasmin, D. R. A., Guiamal, I. P., Guinita, S. S., & Iligan, A. M. M. (2023). Experiences and mathematics anxiety of STEM students. *Journal of Mathematics and Science Teacher*, 3(1), em028.
- [19] Ramirez, G., Shaw, S. T., & Maloney, E. A. (2018). Math anxiety: Past research, promising interventions, and a new interpretation framework. *Educational psychologist*, 53(3), 145-164.
- [20] Ramos, K. P., Dela Cruz, L. T., & Bautista, M. N. (2020). *Innovative teaching strategies and their effects on learner achievement in science subjects*. Philippine Journal of Teacher Education, 26(1), 44–59.
- [21] Refugio, C. N., Galleto, P. G., & Torres, R. (2019). *Competence landscape of grade 9 mathematics teachers: Basis for an enhancement program*. Cypriot Journal of Educational Sciences, 14(2).
- [22] Sabanal, C. S., Bago, J. S., & Balandra, C. B. (2024). Attitudes toward learning mathematics and performance of Grade 11 students in the new normal. *Asian Journal of Education and Social Studies*, 50(9), 254–263.
- [23] Santos, G. T., Villanueva, M. E., & Corpuz, R. H. (2020). *Home environment and academic success in online learning: A case in the Philippines*. Asia Pacific Education Review, 21(4), 550–563.
- [24] Tagacay, L. A. (2024). Family support, attitude, and mathematics performance of senior high school learners in modular distance learning [Master's thesis, West Visayas State University]. WVSU Institutional Repository. <https://repository.wvsu.edu.ph/handle/20.500.14353/703>.
- [25] Wangdi, K. (2023). Improving Students' Attitude towards Mathematics to Enhance Their Achievement in Mathematics: An Action Research. *Asian Journal of Education and Social Studies*, 49(3), 392-402.
- [26] Zhu, J., & Chiu, M. M. (2019). Early home numeracy activities and later mathematics achievement: Early numeracy, interest, and self-efficacy as mediators. *Educational Studies in Mathematics*, 102(2), 173–191. Available at: <https://doi.org/10.1007/s10649-019-09906-6>.