A Correlational Study Between Students' Mathematical Anxiety and Study Habits

Paraiso, Faith Elaine Grace B; Amancio, Eliezah Mae R; Asis, Alexandra Celina Mae C; Largo, Gwyneth S; Quebec, Daile Verjie M.; Cabanas, Eliezer

University of Cebu Pardo and Talisay

DOI: https://dx.doi.org/10.47772/IJRISS.2025.908000349

Received: 04 August 2025; Accepted: 09 August 2025; Published: 10 September 2025

ABSTRACT

Mathematical anxiety (MA) can negatively affect students' performance and future opportunities, yet its link to study habits remains underexplored in local contexts. This study examined the correlation between MA and the study habits of Grade 11 and 12 students from various academic strands at a Cebu City school. Using a quantitative correlational design, data were collected through a structured survey measuring time management, learning strategies, and test preparation. Descriptive statistics and Pearson's correlation revealed no statistically significant relationship between MA and study habits, though patterns suggest strategies for improving performance and well-being. Recommendations include consistent study routines, early test preparation, active class participation, supportive teaching strategies, and peer tutoring in non-judgmental environments. The findings underscore the need for coordinated efforts among educators, parents, and schools to address MA and support academic success.

Keywords: Mathematical anxiety, Study Habits

INTRODUCTION

Mathematical anxiety is not merely a fear of numbers; it is a silent barrier that limits students' academic potential and career opportunities. Defined as the worry or fear that arises when solving mathematical problems, math anxiety is not a distinct medical condition but rather a situation-specific form of anxiety (West, 2022). It can significantly affect students' ability to grasp concepts, approach tasks with confidence, and achieve optimal learning outcomes (Ramirez et al., 2018).

Strong study habits, the habitual practices that make learning more effective, comfortable, and enjoyable (Kalaimathi et al., 2022), play a crucial role in helping students overcome academic challenges. However, when math anxiety is present, it can disrupt these habits, leading to disengagement and lower performance (Mammarella et al., 2019). This issue is particularly concerning in mathematics, a core subject in senior high school (SHS) that is essential for future career paths in fields such as engineering and manufacturing.

National and international assessments reflect the scope of the problem. The National Achievement Test (NAT) has consistently shown low performance in core SHS subjects, with Mathematics averaging only 35.34 in the Academic Track (Tolentino, 2025). Similarly, the 2022 OECD assessment ranked the Philippines 77th out of 81 countries, with scores far below the global average and among the highest reported levels of math anxiety among 15-year-olds (Ines, 2023). Experts warn that these trends may hinder the nation's ability to meet workforce demands in mathematics-intensive industries.

While existing research links poor study habits and high anxiety levels to weaker math performance (Salimaco Jr., 2020), most studies have focused on general patterns rather than examining how demographic factors—such as age, sex, academic standing, strand, and grade level—shape both math anxiety and study habits. Understanding these relationships is vital for developing targeted, locally relevant interventions that address students' unique backgrounds and learning styles.

This study aims to investigate the relationship between students' profiles, math anxiety, and study habits, examining the influence of demographic variables on these factors and exploring the correlation between math anxiety and study habits. The findings could inform educational policies and strategies that reduce anxiety, improve study habits, and enhance student performance in mathematics, ultimately supporting academic success and career readiness in the Philippines.

METHODOLOGY

Research Design

This study used a quantitative correlational research design to examine the relationship between mathematical anxiety and study habits among senior high school students. This design was appropriate because it allowed for the measurement of associations between variables without manipulation, enabling the identification of patterns and strengths of relationships (Creswell, 2014).

Research Environment

This study focused on Senior High School students in Cebu City, a rapidly urbanizing area. The centrally located school was chosen for its accessibility to both researchers and participants. It is surrounded by residential areas, businesses, and transportation hubs, making it convenient for students. With a diverse student body and various educational programs, the school is an ideal setting for exploring mathematical anxiety and study habits.

Research Respondents

The respondents in this study are Senior High School students from various academic strands: STEM, ABM, HUMSS, GAS, and TVL, in Grades 11 and 12. The study includes 300 students—209 from Grade 11 and 91 from Grade 12. The distribution is as follows: 45 from ABM, 54 from HUMSS, 123 from STEM, 27 from GAS, and 51 from TVL. Using stratified random sampling, students were grouped by their academic strands, and then randomly selected participants from each group. This approach ensures fair representation and allows for a balanced analysis of the relationship between mathematical anxiety and study habits across different strands.

Research Instrument

This study used adapted survey questionnaires to collect data in three areas: demographic profile, mathematical anxiety, and study habits. May's (2009) questionnaire for measuring mathematical anxiety achieved a Cronbach's coefficient alpha of 0.96, indicating strong internal consistency. Olutola's (2016) questionnaire for study habits produced Cronbach's alpha values of 0.78 and 0.81, demonstrating acceptable reliability. Both instruments were suitable for capturing quantitative measures aligned with the study's variables.

Research Procedures

Data Gathering. After securing approval from the school administration and obtaining informed consent from participants and parents (for minors), questionnaires were distributed with the assistance of teachers and class presidents. A set completion period ensured organized data collection, and responses were reviewed to remove incomplete or inconsistent entries.

Data Analysis. Data were analyzed using descriptive and inferential statistics. Descriptive statistics, including frequencies and percentages, summarized the respondents' demographic profiles. Weighted mean scores assessed levels of mathematical anxiety and study habits. Independent samples t-tests and one-way ANOVA identified significant differences in study habits and math anxiety among demographic groups. Pearson's correlation coefficient examined the relationship between math anxiety and study habits. Results were compared with previous studies to support the findings.

Ethical Considerations. The study adhered to ethical research standards by ensuring informed consent, voluntary participation, anonymity, and data confidentiality. No personally identifiable information was collected, and all survey responses were securely stored and disposed of after analysis. Participants retained the right to withdraw at any time without penalty.

RESULTS AND DISCUSSIONS

Table 1. Respondents' Level of Mathematical Anxiety

Statement	Wx̄	Verbal Description	Interpretation
1. I feel confident enough to ask questions in my mathematics class.	2.65	Agree	High
2. I get tense when I prepare for a mathematics test.	3.21	Agree	High
3. I get nervous when I have to use mathematics outside of school.	2.62	Agree	High
4. I believe I can do well on a mathematics test.	2.70	Agree	High
5. I worry that I will not be able to use mathematics in my future career when needed.	2.61	Agree	High
6. I worry that I will not be able to get a good grade in my mathematics course.	3.30	Strongly Agree	Very High
7. I believe I can complete all of the assignments in a mathematics course.	2.21	Disagree	Low
8. I worry that I will not be able to do well on mathematics tests.	3.23	Agree	High
9. I believe I am the kind of person who is good at mathematics.	2.99	Agree	High
10. I believe I will be able to use mathematics in my future career when needed.	2.13	Disagree	Low
11. I feel stressed when listening to mathematics instructors in class.	2.90	Agree	High
12. I believe I can understand the content in a mathematics course	2.45	Disagree	Low
13. I believe I can get an "A" when I am in a mathematics course.	2.95	Agree	High
14. I get nervous when asking questions in class.	2.87	Agree	High
15. Working on mathematics homework is stressful for me.	2.98	Agree	High
16. I believe I can learn well in a mathematics course.	2.32	Disagree	Low
17. I worry that I do not know enough mathematics to do well in future mathematics courses.	3.04	Agree	High
18. I worry that I will not be able to complete every assignment in a mathematics course.	2.84	Agree	High
19. I feel confident when taking a mathematics test.	2.14	Disagree	Low
20. I believe I am the type of person who can do mathematics.	2.75	Agree	High

21. I feel that I will be able to do well in future mathematics courses.	2.64	Agree	High
22. I worry I will not be able to understand the mathematics.	3.09	Agree	High
23. I believe I can do the mathematics in a mathematics course.	2.57	Agree	High
24. I worry that I will not be able to get an "A" in my mathematics course.	3.06	Agree	High
25. I worry that I will not be able to learn well in my mathematics course.	3.02	Agree	High
26. I get nervous when taking a mathematics test.	3.14	Agree	High
27. I am afraid to give an incorrect answer during my mathematics class.	3.28	Strongly Agree	Very High
28. I feel confident when using mathematics outside of school.	2.78	Agree	High
Composite Mean	**2.80**	**Disagree**	**Low**

Table 1 presents the respondents' levels of mathematical anxiety. The highest anxiety was reported in relation to fear of providing an incorrect answer during the mathematics class (mean = 3.28), which indicates that evaluative situations increases anxiety significantly. In contrast, low anxiety was associated with independently completing math assignments (mean = 2.21), reflecting greater comfort and self-confidence when working without external pressure.

The composite mean of 2.80 indicates that, overall, students experience a generally low level of mathematical anxiety. However, the data suggest that anxiety is situational, mainly peaking during public or evaluative tasks and subsiding during independent work. This pattern supports Hashmi's (2021) findings that evaluative anxiety can permanently turn off academic performance, and is consistent with Rozhonjuk's (2020) observation of a negative correlation between mathematics and self-efficacy.

These findings emphasize that most students may not have a continuous, general mathematics anxiety as an important problem. However, the classroom should judge contexts that remain a valuable obstacle to ideal performance. In contrast, addressing this could play an important role in improving students' engagement and outcomes in mathematics.

Table 2. Respondents' Level of Study Habits

Statement	$W\bar{x}$	Verbal Description	Interpretation
1. I always do my assignment on time.	2.89	Agree	High
2. I always read my books even if there is no Exam.	2.02	Disagree	Low
3. I read my book every day.	1.88	Disagree	Low
4. I go through my books after every lesson.	2.15	Disagree	Low
5. I always ahead of my teacher.	1.92	Disagree	Low
6. I always have group discussion with my colleagues.	2.62	Agree	High
7. I have a personal time table which I try to follow.	2.53	Agree	High
8. I am not easily distracted by friends when it is time to study.	2.31	Disagree	Low

9. When I miss anything while coping notes, I try to correct it immediately after the class.	2.87	Agree	High
10. I am easily distracted by noise or radio when it is time to study.	1.99	Disagree	Low
11. I try to read other materials to get more information on the topics taught in the class.	2.93	Agree	High
12. I read my class work during holiday period.	1.99	Disagree	Low
Composite Mean	**2.34**	**Disagree**	**Low**

Table 2 shows the respondents' study habits. The most effective habit reported was reading more material than what is taught in the classroom (mean = 2.93), which indicates an intellectual interest and an off-the-beaten-path approach to learning. In contrast, the least effective habit was daily reading of books (mean = 1.88), indicating low engagement in regular learning activities that an individual may engage in to obtain long-term academic growth.

The overall computed mean of 2.34 falls in the low category; hence, although students might be capable of doing immediate or short-term work in school academic issues, they fail to maintain long-term self-paced learning behaviors.

This pattern aligns with Mayanchi et al. (2019), who reported that surface behaviours in studying are unlikely to support significant academic development when they are not consistent.

It also supports Fernández et al. (2019), who stressed that organized, routine methods of learning, including daily reading, are essential for reducing academic anxiety and enhancing performance, especially in math.

These results suggest that many students adopt a task-oriented rather than a learning-oriented approach to studying. Empowering regular and mindful learning practices is the missing link to improving academic achievement and overall learning engagement.

Table 3. Differences Between the Respondents' Demographic Profile and Their Level of Mathematical Anxiety

Profile	Weighted Mean (Variance)	Critical Value (p-value)	Computed Value (df)	Decision (Remarks)
Age 18 below 18 and above	2.83 (0.10) 2.72 (0.10)	1.98 (0.01)	2.5182 (135)	Reject H_0 (Significant)
Sex Male Female	2.73 (0.10) 2.84 (0.10)	1.97 (0.0)	2.8487 (196)	Reject H_0 (Significant)
Academic Standing Academic Awardee Non-Academic Awardee	2.73 (0.10) 2.84 (0.10)	1.97 (0.0)	1.4489 (196)	Reject H_0 (Significant)
Strand STEM ABM	2.89 (0.11) 2.66 (0.10)	2.40	5.5843	Reject H_0

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume IX Issue VIII August 2025

TVL HUMSS GAS	2.80 (0.06) 2.79 (0.11) 2.69 (0.08)	(0.00)	(299)	(Significant)
Grade Level Grade 11 Grade 12	2.84 (0.10) 2.72 (0.10)	1.97 (0.0)	3.0871 (169)	Reject H_0 (Significant)

Table 3 shows the variations in mathematical anxiety in the demographic groups. Respondents and students under the younger age (18 years and below), females, non-academic awardees, Grade 11 students, and those in the STEM strand were more anxious than their counterparts, with differences in each case found to be statistically significant ($p < 0.05$). Remarkably, STEM students have the highest average level of anxiety (2.89), implying that more technical and math-oriented content can increase the sense of pressure in performance.

These results align with Ramirez et al. (2022), who discovered that mathematical anxiety is determined by personal factors such as age, gender, self-beliefs, and contextual factors like academic demands and subject difficulty. This same high anxiety between STEM students supports the idea that high-pressure academic programs increase stress. In contrast, higher anxiety in younger, less experienced students points to a possible role of academic maturity in managing math-related challenges.

Overall, the results indicate the necessity of creating demographic-specific interventions to work with math anxiety, particularly in the younger learners, female students, and students enrolled in high-pressure academic strands.

Table 4. Differences Between the Respondents' Demographic Profile and Their Level of Study Habits

Profile	Weighted Mean (Variance)	Critical Value (p-value)	Computed Value (df)	Decision (Remarks)
Age 18 Below 18 and above	2.32 (0.23) 2.39 (0.18)	1.98 (0.20)	1.2984 (150)	Do Not Reject H_0 (Not Significant)
Sex Male Female	2.35 (0.29) 2.33 (0.18)	1.97 (0.73)	0.3451 (164)	Do Not Reject H_0 (Not Significant)
Academic Standing Academic Awardee Non-Academic Awardee	2.39 (0.21) 2.00 (0.22)	1.98 (0.25)	1.1448 (129)	Do Not Reject H_0 (Not Significant)
Strand STEM ABM TVL	2.28 (0.22) 2.36 (0.18) 2.46(0.27)	2.40 (0.24)	1.3807 (299)	Do Not Reject H_0 (Not Significant)

HUMMS GAS	2.34(0.17) 2.31(0.24)			
Grade Level Grade 11 Grade 12	 2.31 (0.23) 2.41(0.18)	1.97 (0.07)	1.8449 (190)	Do Not Reject H_0 (Not Significant)

Table 4 indicates that none of the five demographic variables considered (age, gender, academic standing, strand, and grade level) impacted the study habits significantly ($p > 0.05$ in all of the cases). Even though some minor differences in mean scores were seen, such as the average score was slightly higher on Grade 12 compared to Grade 11 and on the TVL strand on average compared to other subjects, these differences were not statistically significant.

These results align with those of Tibus et al. (2024) and EBSCO (2025), who found that demographic factors do not usually make much difference in determining study habits. Instead, it is a combination of personal motivation and environmental factors. Although in some cases researchers remark that students on a specialised track can also establish their patterns of study activities, the present findings indicate that particularities can prove to be negligible unless more powerful personal or situational factors are involved.

Overall, the results indicate that improving study habits may require strategies that focus less on demographic targeting and more on fostering intrinsic motivation and effective learning environments.

Table 5. Relationship Between Respondents' Mathematical Anxiety and Their Study Habits

Variables	Computed value r	Tabular Value r	p-value	Decision (Remark)	Coefficient of Determination R-squared
Mathematical Anxiety and Study Habit	0.01 (negligible)	0.1129	0.90	Do not Reject (Not Significant)	0.000048

Table 5 shows that there is no statistically significant correlation between mathematical anxiety and study habits strengths ($r = 0.01$, $p = 0.90$). Coefficients of determination (R 2 = 0.0000048) indicate that study habits are explained by math anxiety to a minimal extent.

These findings align with Hashmi (2021), who concluded that math anxiety has little effect on the overall study strategies of students, and with Shuaibu (2024), who emphasized that organized practices and motivation have more impact on studying outcomes than the levels of anxiety in them. While math anxiety can impact performance, the results suggest it does not meaningfully shape how students organise or maintain their study habits.

CONCLUSION

The study revealed important insights into the demographic profile, mathematical anxiety, and study habits of senior high school students. Most of the respondents were younger than eighteen, predominantly female, and largely non-academic awardees, with many enrolled in the STEM strand and currently in Grade 11. It was found that students experienced the highest levels of anxiety when confronted with the possibility of giving wrong answers in class, showing an intense fear of negative evaluation. On the other hand, they felt more comfortable completing math assignments independently, highlighting the role of external pressures in influencing anxiety levels. Differences in math anxiety were evident based on age, sex, academic strand, and grade level, whereas academic standing did not appear to play a significant role.

Regarding study habits, students generally displayed poor routines, although Grade 12 students showed notable improvement compared to their Grade 11 counterparts, suggesting that better study habits may develop with academic experience. Interestingly, demographic factors such as age, sex, strand, and academic awards did not significantly influence study behaviours. Additionally, the study found no significant relationship between mathematical anxiety and study habits, implying that a student's level of anxiety in math does not directly affect their approach to studying. These findings suggest that while demographic characteristics and classroom dynamics can influence anxiety, the development of study habits is more closely tied to personal growth and self-motivation over time.

RECOMMENDATION

Although the study found no significant relationship between mathematical anxiety and study habits, the results suggest several actionable strategies to enhance students' academic performance and well-being:

1. Students are encouraged to develop consistent study routines by setting aside dedicated time for learning and preparing in advance for assessments. To build self-confidence, they could participate actively in class without fear of making mistakes, viewing errors as part of the learning process. They could also seek guidance through counselling services, peer support, or math development seminars to strengthen both confidence and competence.

2. Educators could foster a supportive classroom environment that encourages open expression and normalises mistakes, while employing varied teaching strategies to cater to different learning styles and address individual weaknesses. They could implement structured peer tutoring programs with older students mentoring younger ones, and conduct initial assessments to identify learning needs and preferred tutoring formats, whether one-on-one, group, or written support. Instructors could also be trained to recognise signs of math anxiety and promote collaborative, non-judgmental learning spaces.

3. Parents could provide consistent emotional support and maintain a positive attitude toward learning, avoiding harsh criticism and encouraging open communication about academic struggles to build resilience and motivation.

4. Schools could establish structured programs to develop strong study habits and address math anxiety, provide quiet, welcoming study areas and accessible tutoring spaces, and offer training sessions for teachers and peer tutors on identifying and addressing student anxiety effectively.

5. 5. Further research could explore other factors influencing academic outcomes, such as emotional well-being, teaching strategies, and individualized study habits, and investigate the long-term effects of peer tutoring and tailored support programs on students' confidence and mathematics performance.

REFERENCE

1. Creswell, J. W., Gay, L. R., Arikunto, Riduwan, Louise, Marguerite G. Lodico, & Sudarmanto.(n.d.). Research Methodology. In research methodology. https://repository.uin-suska.ac.id/4655/4/BAB%20III.pdf
2. EBSCO. (2025, March 27). EBSCOLearning™ announces release of innovative demographicdata research solution. EBSCO Information Services. https://www.ebsco.com/news-center/press-releases/ebscolearningtm-announces-release-innovative-demographic-data-research
3. Fernández, L. M., Wang, X., Ramirez, O., & Villalobos, M. C. (2019c). Latinx students 'mathematics anxiety and their study habits: Exploring their relationship at the postsecondary level. Journal of Hispanic Higher Education, 20(3), 278–296. https://doi.org/10.1177/1538192719852205
4. Fernandez, L. M. (n.d.). A study on Hispanic college students' mathematics anxiety, study habits and academic performances on mathematics- ProQuest. https://www.proquest.com/openview/0ce477b9a1a6a070c77487961897326e/1?cbl=18750&pq-origsite=gscholar
5. Hashmi, S. S. (n.d.-b). The correlation between math anxiety, student placement, and academic achievement in mathematics among Latino high school students enrolled in Algebra 1 courses- ProQuest.

ProQuest. https://www.proquest.com/openview/b7ee36cd2e2f54a47e4254a0c337cb86/1?pq-origsite=gscholar&cbl=18750&diss=y

6. Ines, J. (2023, December 7). PISA result indicates PH education system is 5 to 6 years behind –DepEd. Rappler. https://www.rappler.com/philippines/deped-reaction-statement-program-international-student-assessment-result-022/#:~:text=The%20Philippines%20ranked%2077th%20out%20of%2081,conducted%20by%20the%20OECD%20for%2015%2Dyear%2Dold%20learners
7. . KALAIMATHI, D., JAYANTHI, DR. N. L. N., Dr. M.N. Palsane, Anuradha Sharma, & Dr. Karuna Shankar Mishral. (2022). An Investigation into The Study Habits and Home Environment of High School Students. In IJIRT & Annamalai University, IJIRT (Vol. 9, Issue 1, pp. 1000–1001) [Journal-article]. https://ijirt.org/publishedpaper/IJIRT155480_PAPER.pdf
8. Mammarella, I. C., Caviola, S., & Dowker, A. (Eds.). (2019). Mathematics anxiety: What is known and what is still to be understood (pp. xx–xx). Routledge. https://psycnet.apa.org/record/2019-13681-000
9. Mayanchi, S. A., Khan, A., & Binti Abdul Latif, A. (2019). Relationship among self-concept, study habits and academic achievement of Pre-NCE students in Zamfara State College of Education, Nigeria. International Journal of Recent Technology and Engineering (IJRTE), 7(6S5), 777–780. https://www.ijrte.org/wp-content/uploads/papers/v7i6s5/F11350476S519.pdf
10. May, D. K. & Maureen Grasso. (2009). Mathematics Self-efficacy and Anxiety Questionnaire(Dorothy Y. White & Jeremy Kilpatrick, Eds.). https://getd.libs.uga.edu/pdfs/may_diana_k_200908_phd.pdf
11. OECD. (2023). PISA 2022 Results (Volume I): The State of Learning and Equity in Education.OECD Publishing. https://doi.org/10.1787/53f23881-en
12. Olutola, A. T., Olatoye, O. O., & Olatoye, R. A. (2016).Assessment of social media utilization and study habit of students of tertiary institutions in Katsina State. (2016). Journal of Education and Practice, 178–179. https://www.researchgate.net/publication/309310376
13. Ramirez, G., Hooper, S. Y., Kersting, N. B., Ferguson, R., & Yeager, D.(2018). Teacher math anxiety relates to adolescent students' math achievement. AERA Oper, 4(1), https://doi.org/10.1177/2332858418756052
14. Rozgonjuk, D., Kraav, T., Mikkor, K., Orav-Puurand, K., & Täht, K. (2020). Mathematics anxiety among STEM and social sciences students: The roles of mathematics self-efficacy, and deep and surface approach to learning. International Journal of STEM Education, 7, Article 46. https://doi.org/10.1186/s40594-020-00246z stemeducationjournal.springeropen.com+2files.eric.ed.gov+2
15. Salimaco Jr., R. A. (2020). Mathematics Achievement of Senior High School Students: Impact of Study Habits and Anxiety. International Journal of English and Education, Volume: 9(Issue: 3), 2278–4012. https://www.researchgate.net/publication/343276344_Mathematics_Achievement_of_Senior_High_School_Students_-_Impact_of_Study_Habits_and_Anxiety
16. Shuaibu, A., & Achimugu, L. (2024). Study Habits and Test Anxiety as Correlates of Senior Secondary School Students' Academic Performance in Mathematics in Kogi State, Nigeria. Journal of Science, Technology and Mathematics Pedagogy, 2(2), 165–178. https://jostmpksu.com.ng/index.php/jostmp/citationstylelanguage/get/harvard-cite-them-right?submissionId=164&publicationId=164
17. Tibus, E. D., & De Gracia, V. N. (2024). Are demographic profile and study habits precursors of academic performance among English majors? Library Progress International, 44(3), 1944–1956. https://doi.org/10.48165/bapas.2024.44.2.1 BPAS Journals
18. Tolentino, A. J. (2025, March 19). NAT 2024 results show ‘low proficiency’ among Grade 12 students across all regions. Explained PH | Youth-Driven Journalism. https://www.explained.ph/2025/03/nat-2024-results-show-low-proficiency-among-grade-12-students-across-all-regions.html
19. West, M. (2022, September 29). Math anxiety: What it is and how to overcome it. Medical News Today. https://www.medicalnewstoday.com/articles/math-anxiety-definition-symptoms-causes-and-tips