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PREDICTORS OF MATHEMATICS ANXIETY: ITS RELATION TO THE STUDENTS' ACADEMIC BEHAVIOR IN MATHEMATICS

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ABSTRACT

This study aims to determine the predictors of math anxiety and its relation to the students' academic behavior in mathematics. It analyzes the profile of the respondents, assess students' level of math anxiety academic behavior. It also establish relationships between respondent profiles and mathematics anxiety on academic behavior.

The research design used in this study is descriptive method of research. The respondents of this study is selected using a purposive sampling method composed of 200 private senior high school students from the division of Laguna. A researcher-made and expert-validated survey questionnaire composed of three parts was used in this study.

The findings show that most respondents are 19-year-old, female ABM strand students. The majority has a medium socioeconomic status and came from households with moderate family sizes. The study identifies varying levels of math anxiety among students, they were very anxious to subject mastery and instructional strategies, and moderately anxious to ability and confidence, learning environment, and feedback and encouragement. The findings also indicate that students generally exhibit low academic behavior in mathematics. The results show that there is a significant relationship between students' demographic profile and academic behavior in mathematics. Moreover, there is a significant relationship between the predictors of mathematics anxiety and students' academic behavior in mathematics.

It was observed that there is significant relationship between the students' demographic profile as well as predictors of mathematics anxiety on their academic behavior in mathematics thus leading to the rejection of both hypotheses. This means that developing customized teaching approaches to address the diverse backgrounds of students is important. Moreover, curricula should focus on foundational understanding and skill-building in mathematics to alleviate anxiety and promote a positive academic experience, thus fostering creativity and innovation.

The study recommends teachers adjust teaching methods to suit varying levels of math anxiety and academic behavior among students. Students are encouraged to reflect on strengths, weaknesses, and anxiety coping strategies, while leaders should provide growth opportunities.

KEYWORDS: *predictors; math anxiety; students' academic behavior*

1. INTRODUCTION

The cornerstone of education and the advancement of humanity is mathematics, which is frequently referred to as the language of science and a necessary talent for modern life. However, the idea of having to work with mathematical ideas and equations fills a lot of students with dread and worry.

Mathematics anxiety is a widespread problem that cuts across age, gender, and educational levels. It is characterized by dread, tension, and unease when faced with mathematical activities. Mathematics anxiety has drawn the attention of educators, psychologists, and academics as an emotional roadblock to mathematical learning.

The negative effects of mathematics anxiety go beyond simple emotional anguish. It adversely affects academic performance, preventing students from developing to their full mathematical potential. The nagging question in education is not just "why" math anxiety occurs, but also "what factors contribute to its development, persistence, and, ultimately, how it relates to students' academic behavior in math."

There are many students that have mathematics anxiety in a variety of educational settings, making it a widespread issue. Many students, whether in elementary school, high school, or further education, struggle with math anxiety to varied degrees. As a result, individuals could engage in avoidance behaviors, choose a different course of study, or adopt a fixed mentality that lowers their self-efficacy in mathematical activities.

It has long been understood that math anxiety, a common psychological phenomenon, is a significant obstacle to scholastic success in mathematics. When faced with mathematical problems, people's anxiety can be crippling and have a negative impact on their confidence, ability to solve problems, and performance in the subject.

This study examined the complex relationship between math anxiety and students' academic behavior in mathematics with the goal of illuminating the root causes, effects, and potential remedies for this pervasive problem. This research aimed to provide a thorough understanding of math anxiety's role in education and propose strategies to empower students in overcoming this significant barrier on their path to mathematical success. This can be done by looking at the

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factors causing math anxiety, its negative effects on students' attitudes and mathematical achievements, and the interventions designed to lessen its impact.

1.1 Statement of the Problem

Specifically, this study answered the following questions;

1. What is the student's demographic profile with regards to:
   - 1.1 age;
   - 1.2 sex;
   - 1.3 Strand;
   - 1.4 Socio-Economic Status; and
   - 1.5 Family Size?
2. What is the level of predictors of mathematics anxiety with regards to:
   - 2.1 Subject Mastery;
   - 2.2 Instructional Strategies;
   - 2.3 Ability and Confidence;
   - 2.4 Learning Environment; and
   - 2.5 Feedback and Encouragement?
3. What is the level of students' academic behavior with regards to:
   - 3.1 Task Completion;
   - 3.2 Self-Regulation;
   - 3.3 Study Habits;
   - 3.4 Creativity and Innovation; and
   - 3.5 Collaborative Attitude
4. Do the demographic profile of respondents have a significant relationship to students' academic behavior in mathematics?
5. Do the predictors of mathematics anxiety have a significant relationship to students' academic behavior in mathematics?

2. METHODOLOGY

The research design used in this study was descriptive method of research to analyze the relationship between the predictors of mathematics anxiety and the students' academic behavior in mathematics of selected senior high school students in the division of Laguna.

To investigate this question, a quantitative research design specifically, the survey method of quantitative research was applied in this study.

According to Creswell, the descriptive research design is a study that describes the characteristics of a population or phenomenon being studied. Primarily used to gain an understanding of a group or phenomenon. This involves collecting data through surveys, interviews, or observation.

In the course of answering research questions, 'strongly agree' and 'agree' were classified as agree. Similarly, 'strongly disagree' and 'disagree' were classified as disagree.

3. RESULTS AND DISCUSSION

This chapter deals with the presentation, interpretation and analysis of data gathered to determine the correlation between the predictors of mathematics anxiety and the students' academic behavior in mathematics.

Demographic Profile of Respondents

In this study, the demographic profile of respondents refer to age, sex, strand, socio-economic status, and family size.

The following figures illustrate the detailed demographic breakdown of the respondents. By presenting this information visually through pie charts the researcher offer a clear and concise overview of the key demographic profile of the respondents. These visual representations will enable us to quickly grasp the distribution and proportions within the sample, facilitating a deeper understanding of the sample under study.

Figure 1 presented the age distribution of students within the sample. 96 of the 200 students are 19 years old, making this the most common age group in the dataset. Additionally, 90 pupils are 18 years old, which is the second largest number. On the other hand, only 14 pupils are 17 years old, indicating a much lower proportion of the sample.

Understanding student age distribution is critical for educational institutions and policymakers to tailor their programs, curriculum, and support services to the needs of students at various phases of their academic careers. This information can be used to build age-appropriate learning resources, address age-specific issues, and foster a supportive and inclusive learning environment for students of all ages.

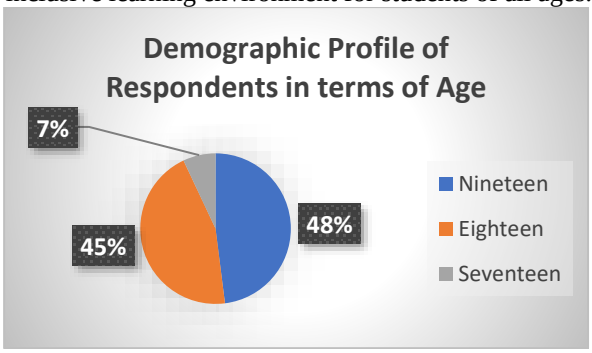


Figure 1. **Demographic Profile of the Respondents in terms of Age**

Figure 2 depicts the student gender profile. It was discovered that 78 out of 200 respondents are male, while 122 out of 200 are female. This suggests that the sample has a higher proportion of female students. Females constitute the majority of the student population.

Understanding student gender distribution is critical for educational institutions and policymakers seeking equitable access and representation in a variety of academic and extracurricular activities. It aids in recognizing potential gender gaps and adopting initiatives to achieve gender equality in education. Furthermore, this information might help in designing programs and support services that cater to the specific needs and experiences of male and female students.

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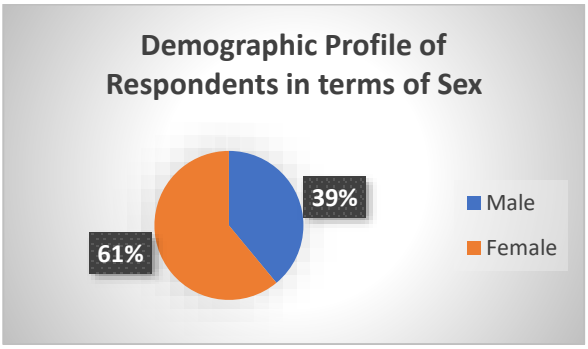


Figure 2. **Demographic Profile of the Respondents in terms of Sex**

Figure 3 presented the respondents' profile by strand. Of the 200 students enrolled, 34 are in the TVL strand and 33 are in the HUMSS strand. 27 pupils have chosen the GAS strand, while 45 students have chosen the STEM strand. Finally, the ABM strand has the largest enrollment percentage, with 61 students opting for this academic track.

These figures provide vital insights into students' preferences and choices when choosing their academic paths. They provide educational institutions with advice on resource allocation, curriculum development, and offering a varied range of options for students to pursue their interests and careers.

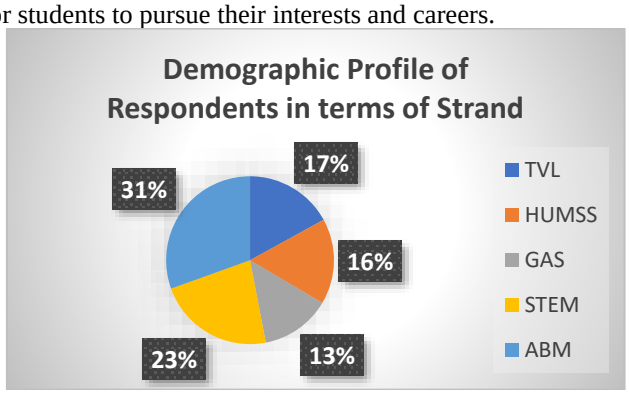


Figure 3. **Demographic Profile of the Respondents in terms of Strand**

Figure 4 represents the distribution of pupils based on their socio-economic status. Out of the 200 pupils included in the study, 37 were identified as having a poor socio-economic status. This suggests that just a tiny minority of students come from low-income households. The majority of pupils, 157 to be precise, are classified as having a medium socioeconomic status. This indicates that a sizable proportion of the student population comes from households with moderate financial stability. On the other hand, just 6 students, particularly, were classed as having a high socio-economic status. This suggests that a small proportion of the students come from households with more economic status and resources.

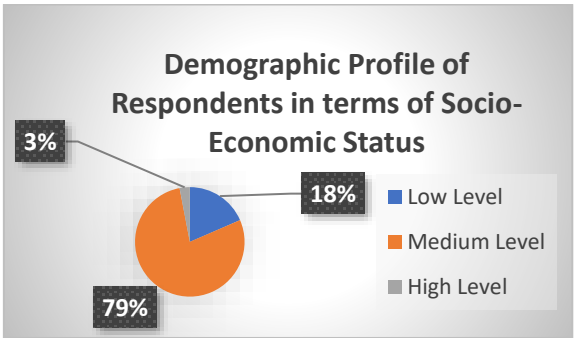


Figure 4. **Demographic Profile of the Respondents in terms of Socio-Economic Status**

Understanding the socio-economic profile of the student population is critical for educational institutions and policymakers in tailoring support and resources to the requirements of students from various socio-economic backgrounds. It can aid in the identification and resolution of potential educational hurdles, as well as the creation of an inclusive learning environment that supports equal opportunity for all students, regardless of socioeconomic situation.

The family size distribution of the pupils is summarized in Figure 5. Of the 200 pupils that were part of the study, 18 were from large households. It can be concluded that a minority of students live with a comparatively larger number of relatives.

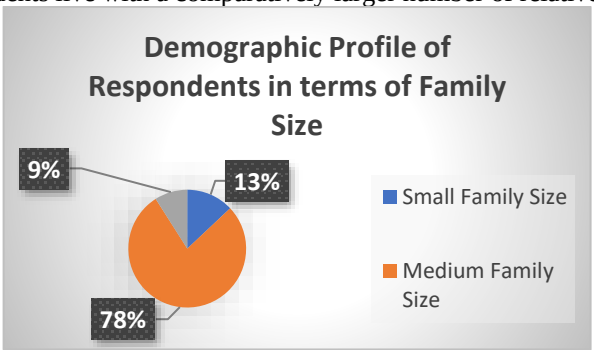


Figure 5. **Demographic Profile of the Respondents in terms of Family Size**

The majority of students—156 in total—come from households with moderate incomes. This suggests that a sizable fraction of students come from homes with a moderate number of family members. On the other hand, 26 pupils, however, come from modest backgrounds. This means that a smaller percentage of students originate from households with fewer members.

By analyzing the student population distribution according to family size, one can gain an understanding of the social dynamics and student support systems. By developing their programs and services to each student's unique needs based on their family size, educational institutions and policymakers can benefit from it. In order to meet their specific demands, students from smaller homes might benefit from specialized resources, whereas students from bigger families would need more assistance with household tasks.

Level of Predictors of Mathematics Anxiety

In this study, the level of Predictors of Mathematics anxiety refers to Subject Mastery; Instructional Strategies; Ability and

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Confidence; Learning Environment; and Feedback and Encouragement.

The following tables shows the statement, mean, standard deviation and remarks.

Table 1 illustrates the level of predictors of mathematics anxiety with regards to subject mastery as perceived by students.

Table 1. Level of Students' Mathematics Anxiety with regards to Subject Mastery

STATEMENT	*MEAN*	*SD*	*REMARKS*
My difficulty in understanding mathematical concepts contributes to my anxiety in math class.	3.67	0.94	Agree
When I feel overwhelmed by math problems, I become anxious about my ability to do well in math class.	3.87	0.92	Agree
I often feel like I don't understand the concepts being taught in mathematics class.	3.44	1.08	Agree
I feel anxious when I have to take mathematics tests.	3.47	1.04	Agree
I feel frustrated when I cannot solve mathematics problems	3.95	1.00	Agree
Weighted Mean		*3.68*	
SD		*1.02*	
Verbal Interpretation		*Very Anxious*	

Students agree that they experience frustration when they are unable to answer mathematical problems (M= 3.95, SD= 1.00). This implies a need for better problem-solving support and resources to reduce frustration. Likewise, getting overwhelmed by mathematics problems makes them worry about performing well in math class (M= 3.87, SD= 0.92), suggesting that strategies to manage complexity could enhance performance. Students also agree that their inability to comprehend mathematical concepts significantly impacts their anxiety levels in math class (M= 3.67, SD= 0.94), indicating that improving comprehension could reduce anxiety. They acknowledge feeling nervous before mathematics tests (M= 3.47, SD= 1.04), pointing to the potential benefit of test-taking strategies and anxiety reduction techniques. Lastly, students express doubts about their comprehension of the material covered in math class (M=3.44, SD=1.08), highlighting the need for clearer instruction and additional support.

The weighted mean score of 3.68 and the standard deviation of 1.02 indicate that students were very anxious with regards to subject mastery in mathematics class. These findings highlight the importance of treating conceptual understanding issues, overcoming daunting math problems, and controlling test-related anxiety in order to successfully reduce total mathematics anxiety.

Table 2 illustrates the level of predictors of mathematics anxiety with regards to instructional strategies as perceived by students.

Table 2. Level of Predictors of Mathematics Anxiety with regards to Instructional Strategies

STATEMENT	*MEAN*	*SD*	*REMARKS*
I feel anxious when my teachers move too quickly through mathematical concepts	3.92	0.98	Agree
I feel anxious when my teacher explains mathematics concepts using abstract methods.	3.58	0.89	Agree
I feel anxious when my teacher uses a lot of technical jargon and terminology	3.81	0.93	Agree
I feel anxious about rules and procedures and understanding problem-solving alongside memorization	3.61	1.07	Agree
I feel anxious when my mistakes are criticized and emphasized errors	3.97	0.99	Agree
Weighted Mean		*3.78*	
SD		*0.98*	
Verbal Interpretation		*Very Anxious*	

Students agree that they feel anxious when faults are highlighted and reprimanded (M= 3.97, SD= 0.99). This implies that a more supportive and less punitive approach could reduce anxiety. Similarly, teachers who proceed quickly through mathematical concepts cause significant anxiety (M= 3.92, SD= 0.98), suggesting the need for a slower, more deliberate teaching pace. The use of a lot of technical language also contributes to their anxiety (M= 3.81, SD= 0.93),

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indicating a benefit in simplifying language. Abstract teaching methods add to their anxiety as well (M= 3.58, SD= 0.98), which implies that more concrete and relatable teaching methods might be more effective. Additionally, there is anxiety associated with understanding rules and procedures, solving problems, and memorizing information (M= 3.61, SD= 1.07), highlighting the need for strategies that simplify these aspects and improve comprehension.

In summary, a high degree of agreement is shown by the weighted mean of 3.78 and the standard deviation of 0.98, this indicates that the students were very anxious with regards to instructional materials which underscore the important role that these factors play in increasing respondents' mathematical anxiousness. This shows that students' experiences of anxiety in the mathematics classroom are influenced by these characteristics of teaching and learning.

It contributes to the field by focusing on mathematics anxiety among students in remedial mathematics courses, a topic that is crucial for educators and institutions.

Table 3 illustrates the level of predictors of mathematics anxiety with regards to ability and confidence as perceived by students.

Table 3. Level of Predictors of Mathematics Anxiety with regards to Ability and Confidence

STATEMENT	*MEAN*	*SD*	*REMARKS*
I doubt my ability to succeed in mathematics	3.50	1.13	Agree
I am discouraged by my mathematics performance	3.26	1.11	Neither Agree nor Disagree
I am afraid of making mistakes in mathematics	3.56	1.27	Agree
I give up easily when I face difficulties in mathematics	3.00	1.16	Neither Agree nor Disagree
I am afraid of being judged for my mathematics ability	3.61	1.15	Agree
Weighted Mean		*3.38*	
SD		*1.18*	
Verbal Interpretation		*Moderately Anxious*	

Respondents generally agree that being evaluated based entirely on their understanding of mathematics causes significant anxiety (M= 3.61, SD= 1.15). This implies the need for diverse evaluation methods to reduce anxiety. Participants also fear making mistakes in math (M= 3.56, SD= 1.27), suggesting that a more forgiving and supportive learning environment could help alleviate this fear. Many respondents doubt their ability to succeed in mathematics (M= 3.50, SD= 1.13), indicating a need for confidence-building measures and support. There is less agreement about feelings of discouragement over arithmetic performance (M= 3.26, SD= 1.11), suggesting that while some students feel discouraged, it is not a universal experience. Similarly, there is less consensus on the propensity to give up quickly when things get tough (M= 3.00, SD= 1.16), highlighting that while persistence is an issue for some, it is not predominant for all students.

The average level of agreement across all statements is indicated by the weighted mean scores of 3.38 and the standard deviation of 1.18, indicating a moderately anxious level between the respondents' ability and confidence, and mathematical anxiety.

Table 4 illustrates the level of predictors of mathematics anxiety with regards to the learning environment as perceived by students.

Table 4. Level of Predictors of Mathematics Anxiety with regards to Learning Environment

STATEMENT	*MEAN*	*SD*	*REMARKS*
I feel isolated and unsupported in my mathematics class	2.95	1.13	Neither Agree nor Disagree
I feel discouraged and disengaged from learning mathematics in my current learning environment.	2.97	1.11	Neither Agree nor Disagree
My mathematics class focuses too much on abstract concepts and not enough on real-world applications	3.14	1.27	Neither Agree nor Disagree
My mathematics class is a stressful and competitive environment	3.18	1.16	Neither Agree nor Disagree
My mathematics class has a limited time for students to practice math problems	3.42	1.15	Agree
Weighted Mean		*3.13*	
SD		*1.10*	
Verbal Interpretation		*Moderately Anxious*	

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Across the statements, respondents frequently show mixed feelings, neither strongly agreeing nor strongly disagreeing with certain features of their mathematics classroom setting. Respondents agree that students in their mathematics class have little time to practice arithmetic problems (M= 3.42, SD= 1.15), suggesting a need for more practice opportunities. Some respondents perceive their mathematics class as stressful and competitive (M= 3.18, SD= 1.16), indicating that a more supportive and collaborative environment might be beneficial. There are also concerns that the class concentrates too much on abstract concepts (M= 3.14, SD= 1.27), implying a need for more concrete and relatable teaching methods. However, there is significant variability in these perceptions, as indicated by the high standard deviations. Moreover, respondents report feeling discouraged and disengaged from learning mathematics (M= 2.97, SD= 1.11) and feeling alone and unsupported (M= 2.95, SD= 1.13). These responses suggest that while some students feel a lack of motivation and support, this is not a universal experience. The variability in responses implies that individual experiences in the mathematics classroom can differ widely, highlighting the need for tailored approaches to address the diverse needs of students.

The weighted mean of 3.13, along with a standard deviation of 1.10, indicates an average level of agreement across all statements. Overall, the data show a complex view of the learning environment's relationship on mathematics anxiety among respondents, with some areas of concern but also variation in perceptions across different parts of the classroom experience the students were moderately anxious with regards to learning environment.

Table 5 illustrates the level of predictors of mathematics anxiety with regards to feedback and encouragement as perceived by students.

Table 5. Level of Predictors of Mathematics Anxiety with regards to Feedback and Encouragement

STATEMENT	*MEAN*	*SD*	*REMARKS*
My mathematics teacher focuses more on my mistakes than on my progress.	2.76	1.23	Neither Agree nor Disagree
I am less likely to participate in mathematics class when I am afraid of receiving negative feedback.	3.31	1.17	Neither Agree nor Disagree
The way feedback is delivered in mathematics makes me anxious.	3.32	1.04	Neither Agree nor Disagree
I feel more anxious about mathematics when I do not receive any feedback.	3.35	1.04	Neither Agree nor Disagree
I feel anxious when I receive feedback on my mathematics assignments.	3.25	1.09	Neither Agree nor Disagree
Weighted Mean		*3.20*	
SD		*1.14*	
Verbal Interpretation		*Moderately Anxious*	

Across various statements, respondents reveal a spectrum of sentiments, neither unequivocally endorsing nor firmly rejecting different facets of their mathematics classroom environment. For instance, they express feeling both discouraged and disengaged from learning mathematics (M= 2.97, SD= 1.11) and also feeling alone and unsupported (M= 2.95, SD= 1.13), highlighting a diversity of experiences among students. This variability underscores the necessity for tailored interventions to effectively address individual needs. Additionally, perceptions vary, with some students perceiving their mathematics class as stressful and competitive (M= 3.18, SD= 1.16), while others feel it emphasizes abstract concepts excessively (M= 3.14, SD= 1.27). These findings underscore the importance of implementing teaching strategies that alleviate stress and foster a supportive learning environment, as well as ensuring a balanced approach to abstract and concrete learning experiences. Nevertheless, respondents unanimously agree that students in their mathematics class have insufficient time to practice arithmetic problems (M=3.42, SD= 1.15), signaling a clear need to allocate more time for practice to enhance understanding and proficiency in mathematics.09948128475

The weighted mean of 3.20, along with a standard deviation of 1.14, indicates an average level of agreement across all statements interpreted as moderately anxious. Overall, the findings provide a varied perspective on the impact of feedback and encouragement on respondents' mathematics anxiety, with different levels of agreement across different components of the feedback process.

Level of Students' Academic Behavior in Mathematics

In this study, the level of Predictors of Mathematics anxiety refers to Subject Mastery; Instructional Strategies; Ability and Confidence; Learning Environment; and Feedback and Encouragement.

The following tables shows the statement, mean, standard deviation and remarks.

Table 6 offers insights into students' academic behavior in mathematics relative to task completion as perceived by the students.

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Table 6. Level of Students' Academic Behavior in Mathematics relative to Task Completion

STATEMENT	*MEAN*	*SD*	*REMARKS*
I set realistic goals for myself when completing math problems.	2.37	0.90	Disagree
I break down complex math problems into smaller, more manageable steps.	2.37	0.88	Disagree
I prioritize my math assignments and manage my time effectively.	2.53	1.00	Disagree
I persist in the face of challenges and setbacks when solving math problems.	2.47	0.79	Disagree
I seek help from teachers or tutors when I need assistance with math problems.	2.37	1.05	Disagree
Weighted Mean		*2.42*	
SD		*0.93*	
Verbal Interpretation		*Low*	

Students' responses indicate several areas where they struggle with important academic skills and behaviors. They particularly disagreed with statements regarding setting realistic goals (M= 2.37, SD= 0.90), breaking down complex problems (M=2.37, SD= 0.88), and seeking help when needed (M= 2.37 SD= 1.05), suggesting a challenge in developing effective problem-solving strategies and recognizing the importance of seeking assistance. Additionally, they exhibited difficulty in prioritizing assignments and managing time (M= 2.53, SD= 1.00), implying potential issues with time management and organizational skills. Moreover, students showed reluctance in persisting through challenges (M= 2.47, SD= 0.79), highlighting a need for fostering resilience and perseverance in the face of academic difficulties. These findings underscore the importance of implementing interventions and support mechanisms to enhance students' academic skills and behaviors essential for success in their education.

The overall weighted mean of 2.42, with a standard deviation of 0.93, indicates a generally low level of effective academic behavior in mathematics among students. This suggests that students may lack important skills and strategies needed for successful task completion in math, highlighting areas where educational interventions could be beneficial.

Table 7 offers insights into students' academic behavior in mathematics relative to self-regulation as perceived by the students.

Table 7. Level of Students' Academic Behavior in Mathematics relative to Self-Regulation

STATEMENT	*MEAN*	*SD*	*REMARKS*
I set clear and achievable goals for myself when learning mathematics concepts.	2.33	0.92	Disagree
I regularly monitor my understanding of mathematics concepts through self-testing and practice problems.	2.52	0.92	Disagree
I utilize various study techniques, such as flashcards, practice problems, concept maps, and mnemonic devices, to enhance my learning.	2.69	1.03	Neither Agree nor Disagree
I manage my anxiety and stress during mathematics tests or challenging assignments through relaxation techniques, positive self-talk, and deep breathing exercises.	2.46	1.08	Disagree
I adjust my learning strategies based on my understanding of the material and the task at hand.	2.18	0.80	Disagree
Weighted Mean		*2.43*	
SD		*0.97*	
Verbal Interpretation		*Low*	

The findings from the statements indicate that students tend to struggle with key self-regulation practices essential for academic success. Specifically, they demonstrate disagreement with practices such as setting clear and achievable goals (mean of 2.33, SD= 0.92), adjusting learning strategies (mean of 2.18, SD=), and consistently monitoring their understanding (mean of 2.52, SD=). Moreover, they neither agree nor disagree on the utilization of various study techniques (mean of 2.69, SD=), indicating uncertainty or inconsistency in their approach to studying.

These results highlight a significant challenge in maintaining effective self-regulation strategies among students, particularly in the context of mastering mathematics. Addressing these struggles is essential for enhancing students' academic performance and fostering their overall learning outcomes.

The weighted mean of 2.43, with a standard deviation of 0.97,

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suggests a low level of academic behavior among all statements. This implies that students generally exhibit poor self-regulation behaviors when learning mathematics, indicating a passive attitude toward their academic efforts. This lack of self-regulation can impede their ability to learn and perform well in mathematics, highlighting a need for interventions to develop better self-regulation skills.

Table 8 offers insights into students' academic behavior in mathematics relative to study habits as perceived by the students.

Table 8. Level of Students' Academic Behavior in Mathematics relative to Study Habits

Statement	*MEAN*	*SD*	*REMARKS*
I create a dedicated and distraction-free study space for mathematics.	2.52	0.84	Disagree
I set a consistent and realistic study schedule for mathematics.	2.69	0.86	Neither Agree nor Disagree
I actively engage with mathematics concepts through reading, note-taking, and summarizing key points.	2.45	0.99	Disagree
I practice solving mathematics problems regularly to reinforce my understanding and problem-solving skills.	2.73	1.06	Neither Agree nor Disagree
I avoid procrastination and distractions during mathematics study sessions.	2.63	1.04	Neither Agree nor Disagree
Weighted Mean		*2.60*	
SD		*0.97*	
Verbal Interpretation		*Low*	

The students expressed disagreement with the importance of creating a dedicated and distraction-free study space (M= 2.52, SD= 0.84) and actively engaging with mathematics concepts through reading, note-taking, and summarizing (M= 2.45, SD= 0.86), suggesting potential challenges in maintaining focus and concentration during study sessions. Their lack of strong agreement or disagreement on setting a consistent and realistic study schedule (M= 2.69, SD= 0.99), practicing problem-solving regularly (M= 2.73, SD= 1.06), and avoiding procrastination and distractions (M= 2.63, SD= 1.04) implies uncertainty or variability in their approach to time management and study habits. These findings underscore the need for interventions aimed at promoting effective study strategies and cultivating a conducive learning environment to enhance students' academic performance and comprehension of mathematical concepts.

The overall weighted mean of 2.60 and a standard deviation of 0.97 indicate a generally low level of agreement with positive study habits. These findings suggest that students have not fully developed effective study habits necessary for success in mathematics. The low level of agreement with these essential study practices highlights a need for strategies and interventions to help students establish better study routines and improve their academic performance in mathematics.

Table 9 presents insights into students' academic behavior in mathematics relative to creativity and innovation as perceived by the students

Table 9. Level of Students' Academic Behavior in Mathematics relative to Creativity and Innovation

STATEMENT	*MEAN*	*SD*	*REMARKS*
I enjoy exploring multiple approaches to solving mathematics problems.	2.57	0.84	Disagree
I am curious about different ways of representing and understanding mathematical concepts.	2.27	0.86	Disagree
I am willing to take risks and try out new things in mathematics	2.25	0.99	Disagree
I am interested in developing new and original solutions to mathematics problems.	2.30	1.06	Disagree
I believe that mathematics can be a tool for innovation and creativity.	2.07	1.04	Disagree
Weighted Mean	*2.29*		
SD	*1.04*		
Verbal Interpretation	*Low*		

Students displayed disagreement with several aspects crucial for fostering creativity and innovation in mathematics. They disagreed with enjoying exploring multiple approaches to solving problems (M= 2.57, SD= 0.84) and being curious about different ways of representing and understanding concepts (M= 2.27, SD= 0.86), indicating potential barriers to embracing diverse perspectives and approaches to problem-solving. Furthermore, they showed a lack of willingness to take risks

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and try new things (M= 2.25, SD= 0.99), develop new and original solutions (M= 2.30, SD= 1.06), and view mathematics as a tool for innovation and creativity (M= 2.07, SD= 1.04), suggesting a challenge in cultivating a mindset conducive to innovation and creativity within the realm of mathematics. These findings underscore the importance of fostering a culture of experimentation, risk-taking, and creative thinking in mathematics education to inspire students to explore and innovate in the field.

The overall weighted mean of 2.29, along with a standard deviation of 1.04, indicates a low level of agreement among students regarding creative and innovative behaviors in mathematics. These findings highlight a general lack of engagement with creative and innovative practices in mathematics, suggesting that students do not view the subject as an avenue for exploring diverse methods or developing novel solutions. This underscores a need for educational strategies that foster a more innovative and creative approach to learning mathematics.

Table 10 provides insights into students' academic behavior in mathematics relative to their collaborative attitude as perceived by the students.

Table 10. Level of Students' Academic Behavior in Mathematics relative to Collaborative Attitude

STATEMENT	*MEAN*	*SD*	*REMARKS*
I enjoy working with others to solve mathematics problems.	2.15	1.04	Disagree
I believe that collaboration can lead to better understanding and problem-solving in mathematics.	1.93	0.91	Disagree
I am willing to share my ideas and insights with others when working on mathematics projects.	2.15	0.97	Disagree
I can effectively communicate my mathematical ideas and concepts to others.	2.45	1.06	Disagree
I take an active role in contributing to the success of mathematics group projects.	2.34	0.96	Disagree
Weighted Mean		*2.20*	
SD		*1.01*	
Verbal Interpretation		*Low*	

Students demonstrated disagreement with several aspects essential for effective collaboration and communication in mathematics. They generally disagreed with enjoying working with others to solve problems (M= 2.15, SD= 1.04) and being willing to share ideas and insights (M= 2.15, SD= 0.97), suggesting potential challenges in fostering a collaborative mindset and encouraging active participation within group settings. Additionally, they showed skepticism regarding the benefits of collaboration for better understanding and problem-solving (M= 1.93, SD= 0.91), indicating a need for interventions aimed at highlighting the value of teamwork in mathematics education. Furthermore, students displayed difficulty in effectively communicating mathematical ideas (M= 2.45, SD= 1.06) and actively contributing to group projects (M= 2.34, SD= 0.96), underscoring the importance of developing communication skills and promoting active engagement in collaborative learning environments. These findings underscore the significance of fostering a collaborative and communicative classroom culture to enhance students' teamwork skills and overall learning outcomes in mathematics.

The overall weighted mean of 2.20, with a standard deviation of 1.01, reflects a low level of agreement among students regarding positive collaborative behaviors in mathematics. These findings suggest a significant lack of enthusiasm and effectiveness in collaborative efforts within the context of mathematics, indicating that students do not perceive collaboration as a beneficial or enjoyable part of their mathematical learning experience. This highlights a need for strategies to enhance students' collaborative skills and attitudes, promoting a more cooperative and supportive learning environment in mathematics.

Significant Relationship between Demographic Profile of Respondents and Students' Academic Behavior in Mathematics

The significant relationship of the demographic profile on students' academic behavior in mathematics, data were treated statistically using spreadsheet by Regression Analysis.

Table 11 shows the results of the statistical analysis of the significant relationship of the demographic profile on students' academic behavior in mathematics, with various demographic profiles analyzed against different aspects of academic behavior.

The data includes the demographic profiles of age, sex, strand, socio-economic status, and family size, along with their respective effects on students' self-efficacy on task completion, self-regulation, study habits, creativity and innovation, and collaborative attitude

The analysis shows that age has no significant relation on task completion with R-value ranging from 0.000 to 0.006 and p-value from 0.293 to 0.848. Similarly, sex has no significant relation on task completion with R-value ranging from 0.000 to

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0.019 and p-value from 0.0.052 to 0.979. Moreover, the strand of students' education has no significant relation with task completion (r = 0.016, p = 0.078) and collaborative attitude (r = 0.023, p = 0.213) but has a significant relation on self-regulation (r = 0.036, p = 0.007); study habits (r = 0.021, p = 0.039); and creativity and innovation (r = 0.069, p = 0.000). Additionally, socioeconomic status had no significant relation on most of the academic behavior of the students (r = 0.000 - 0.010, p = 0.149 - 0.996) except for collaborative attitude (r = 0.019, p = 0.048). Similar to the previous variable, family size had no significant relation on task completion (r = 0.011, p = 0.141), self-regulation (r = 0.005, p = 0.315), study habits (r = 0.005, p = 0.300), and creativity and innovation (r = 0.000, p = 0.985). Nonetheless, a significant relation exists between family size and collaborative attitude (r = 0.041, p = 0.004).

Table 11. Significant Relationship of the Demographic Profile on Students' Academic Behavior in Mathematics

Demographic Profile (IV)	Academic Behavior of Students (DV)				
	Task Completion	**Self-regulation**	**Study Habits**	**Creativity and Innovation**	**Collaborative Attitude**
Age:					
Pearson Correlation	0.005	0.002	0.006	0.000	0.003
p-value	0.317	0.485	0.293	0.848	0.408
N	200	200	200	200	200
Sex:					
Pearson Correlation	0.019	0.001	0.001	0.000	0.007
p-value	0.052	0.615	0.704	0.979	0.213
N	200	200	200	200	200
Strand:					
Pearson Correlation	0.016	0.036*	0.021*	0.069*	0.023
p-value	0.078	0.007	0.039	0.000	0.213
N	200	200	200	200	200
Socio-Economic Status:					
Pearson Correlation	0.000	0.007	0.004	0.010	0.019*
p-value	0.996	0.225	0.349	0.149	0.048
N	200	200	200	200	200
Family Size:					
Pearson Correlation	0.011	0.005	0.005	0.000	0.041*
p-value	0.141	0.315	0.300	0.985	0.004
N	200	200	200	200	200

*Note: * p < .05.*

In summary, the statistical analysis shows that while some demographic factors, such as age and sex, have no significant effect on academic behavior, others, such as strand, socio-economic status and family size, have a significant impact on students' approach to task completion, self-regulation, study habits, creativity and innovation, and collaborative attitude in mathematics. These findings provide important insights into the impact of demographic characteristics on students' academic behavior and may drive tailored interventions to assist their academic growth.

Test of Significant Relationship between Predictors of Mathematics Anxiety and Academic Behavior of Students

To test the significant relationship between the predictors of mathematics anxiety and academic behavior of students, data were treated statistically using Minitab 14 using the Pearson Correlation Coefficient.

The table summarizes the results of the study examining the predictors of mathematics anxiety and their correlation with various aspects of students' academic behavior using the Pearson Correlation Coefficient in a Linear Regression Analysis.

Subject mastery revealed very weak positive correlation with task completion (r = 0.005), self-regulation (r = 0.002), study habits (r= 0.009), and collaborative attitude (r = 0.002), none of which are statistically significant. However, there is a weak positive correlation with creativity and innovation (0.044), which is statistically significant (p = 0.003). Instructional strategies show very weak positive correlations with task completion (0.009), self-regulation (0.000), study habits (0.001), creativity and innovation (0.015), and collaborative attitude (0.018), none of which are statistically significant. Moreover, for ability and confidence, the correlations with task completion (0.000), self-regulation (0.001), study habits (0.005), creativity and innovation (0.003), and collaborative attitude (0.015) are all very weak and not statistically significant.

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Table 12. Significant Relationship between Predictors of Mathematics Anxiety and Academic Behavior of Students

Predictors of Mathematics Anxiety (IV)	Academic Behavior of Students (DV)				
	Task Completion	Self-Regulation	Study Habits	Creativity and Innovation	Collaborative Attitude
Subject Mastery:					
Pearson Correlation	0.005	0.002	0.009	0.044*	0.002
p-value	0.324	0.513	0.162	0.003	0.560
N	200	200	200	200	200
Instructional Strategies:					
Pearson Correlation	0.009	0.000	0.001	0.015	0.018
p-value	0.164	0.761	0.589	0.081	0.061
N	200	200	200	200	200
Ability and Confidence:					
Pearson Correlation	0.000	0.001	0.005	0.003	0.015
p-value	0.659	0.637	0.309	0.415	0.082
N	200	200	200	200	200
Learning Environment:					
Pearson Correlation	0.009	0.001	0.003	0.037*	0.013
p-value	0.166	0.593	0.469	0.007	0.113
N	200	200	200	200	200
Feedback & Encouragement:					
Pearson Correlation	0.002	0.008	0.003	0.003	0.001
p-value	0.544	0.209	0.451	0.455	0.625
N	200	200	200	200	200

*Note: * $p < .05$.*

Learning environment shows very weak positive correlations with task completion (0.009), self-regulation (0.001), study habits (0.003), and collaborative attitude (0.013), none of which are statistically significant. However, there is a weak positive correlation with creativity and innovation (0.037), which is statistically significant ($p = 0.007$). Finally, feedback and encouragement show very weak positive correlations with task completion (0.002), self-regulation (0.008), study habits (0.003), creativity and innovation (0.003), and collaborative attitude (0.001), none of which are statistically significant.

Overall, the analysis revealed that most predictors of mathematics anxiety exhibit very weak positive correlations with different aspects of students' academic behavior, and the majority of these correlations are not statistically significant. The exceptions are the statistically significant weak positive correlations between creativity and innovation with subject mastery and with the learning environment. These findings suggest that while there may be some influence of these predictors on academic behaviors, their impact is generally minimal, with only specific areas showing meaningful relationships.

4. CONCLUSION AND RECOMMENDATIONS

It was observed that here is significant relationship between the demographic profile of the students and their academic behavior in mathematics thus leading to the rejection of the null hypothesis. This highlights the necessity for targeted interventions that cater to the specific needs of different demographic groups. Educators and policymakers can develop customized teaching approaches to address the diverse backgrounds of students, such as varying socio-economic statuses, ages, and genders, ensuring that each group receives appropriate support.

Similarly, there is significant relationship between the predictors of mathematics anxiety and students' academic behavior leading to the rejection of null hypothesis. The findings emphasizes that factors such as subject mastery, instructional strategies, ability and confidence, learning environment, and feedback and encouragement significantly influence students' academic behaviors in mathematics. Consequently, it is crucial to address these predictors to mitigate mathematics anxiety and improve academic performance.

Considering the findings and conclusions of the study, the following are recommended.

1. Teachers may modify their instructional approach to accommodate students' various levels of mathematics anxiety and academic behavior. This could include adding more collaborative activities, giving constructive criticism, and creating a supportive learning atmosphere that encourages creativity and innovation.
2. Students may participate in self-reflection to recognize their mathematical skills and weaknesses, as well as develop anxiety-reducing strategies. Thus setting realistic goals, getting aid when necessary, and developing healthy study habits can all help improve academic success.
3. Parents may play an important role in their children's intellectual development. They should provide a supportive family atmosphere that promotes open communication, fosters a good attitude toward mathematics, and offers opportunities for additional assistance if necessary.

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