Mind Over Math: Teacher's Learning Support in Alleviating Anxiety among Grade 10 Students in Learning Mathematics

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ABSTRACT

This study investigated the role of teacher support in alleviating mathematics anxiety among Grade 10 students at General Santos City National High School. Using a descriptive-correlational research design, quantitative data were collected from 341 students across different academic strands through validated questionnaires assessing math anxiety and perceived teacher support.

The findings revealed that students exhibited a moderately high level of math anxiety, particularly in cognitive aspects such as difficulty recalling and applying mathematical concepts during assessments. Environmental and behavioral factors also contributed significantly, with students reporting anxiety related to classroom dynamics and personal study habits. On the other hand, teacher support was rated highly, with competence and relatedness support perceived at a very high level, suggesting that students felt encouraged, respected, and emotionally supported in their learning environment.

Statistical analysis showed a weak but significant negative correlation between math anxiety and teacher support, indicating that as teacher support increases, student anxiety tends to decrease. The study underscores the importance of fostering autonomy, competence, and relatedness in the classroom to build student confidence and reduce anxiety, aligning with principles of Self-Determination Theory. A Math Anxiety Relief Program (MARP) was proposed to provide structured interventions aimed at reducing anxiety and improving math performance through personalized learning, collaboration, and emotional support strategies.

INTRODUCTION

Background of the Study

Mathematics anxiety is a prevalent issue that significantly impacts individuals' academic performance and career choices, particularly in STEM fields. Defined as feelings of tension, apprehension, or fear that interfere with math performance, this anxiety can emerge early in childhood and persist into adulthood. Recent studies have highlighted its widespread nature and the various factors contributing to its development.

While math anxiety can appear in early elementary school, it's common for it to emerge around middle school or junior high, as kids confront more complicated mathematical concepts. And studies show that can happen even among kids with strong math skills. In a longitudinal study, Geary followed teens in grades seven through nine. Their math anxiety tended to increase over those years for all kids, as math lessons became more difficult and increasingly abstract (*Journal of Educational Psychology*, Vol. 115, No. 5, 2023).

Other studies, such as those by Escarez Jr. & Ching (2022), shows that math anxiety can negatively affect students' ability to understand and represent mathematical concepts. This anxiety often peaks during exams or when students face unfamiliar questions, which can hinder their performance.

As our world becomes more data-driven, mathematical literacy empowers individuals to navigate and interpret the complexities of modern life, fostering informed citizenship and global competitiveness.

However, despite the great importance of the said subject, many students seem to develop anxiety towards it. Many researchers highlight that math anxiety is widespread among Filipino students particularly in high school and college, and can significantly hinder the mathematical performance. A study conducted by Delgado and Kassim (2019) found that math anxiety is prevalent among Filipino high school students, with female students experiencing slightly higher anxiety levels than males, although the difference was not statistically significant. The study also found that socio-economic status had little effect on levels of math anxiety among students. Math anxiety, defined by feelings of tension and fear towards mathematical tasks, significantly impacts students' performance, as confirmed by multiple researchers over the years.

Mathematics performance in the Philippines has been consistently below global standards, as demonstrated by various international assessments. In the 2019 Trends in International Mathematics and Science Study (TIMSS), the Philippines ranked at the bottom among participating countries. Filipino Grade 4 students scored an average of 297 points, significantly lower that the TIMSS scale center point of 500. This result highlights the country/s struggle in mathematics education, where students show considerable gaps in basic computational skills ang problem-solving abilities (Mullis, et. Al 2020).

Similarly, the 2018 Programme for International Student Assessment (PISA) results revealed that the Philippines ranked 78th out of 79 countries in mathematics, with an average of 489. The low performance is attributed to factors such as limited access to quality education, a shortage of well-trained teachers, and the lack of sufficient resources in schools (OECD 2019)

Furthermore, due to the results of the 2018 Program for International Student Assessment (PISA), many countries are re-evaluating their education systems and the quality thereof, particularly in Reading, Mathematics, and Science. The Association of Southeast Asian Nations (ASEAN) is one of the community allies that have been alarmed by these findings. Moreover, the Department of Education in the Philippines has initiated steps to revisit its curriculum. Both legislative bodies of the country, the upper and lower houses, have engaged in addressing the current issues in education (Aljon, et al., 2019).

Currently, the Department of Education is implementing programs aimed at improving the quality of education in the country. This include National Mathematics Program. This program aims to improve the numeracy and mathematics competencies of students across all grade levels. Specifically, it targets students' "shared understanding of numeracy and its critical connections with mathematics and the real world." It will also "increase the availability of broad and reliable data on numeracy and mathematics progress and achievement."

Given the vital importance of mathematics in education and future career opportunities, it is crucial to investigate and implement strategies that can help alleviate math anxiety among Grade 10 students. This thesis seeks to identify and assess various teaching methods, classroom strategies, and support mechanisms that can mitigate math anxiety. By understanding the root causes of this anxiety and addressing them with targeted interventions, educators can foster a more supportive learning environment that boosts students' confidence and improves their performance in mathematics.

Theoretical Consideration of the Study

One of the most influential recent developments in understanding anxiety in education is the concept of a growth mindset, introduced by Dweck but widely applied in research post-2019. Teachers can use growth mindset strategies to reduce math anxiety by encouraging students to view challenges as learning opportunities rather than as signs of failure. A growth mindset, which emphasizes the belief that abilities can be developed through effort and learning, has been shown to significantly reduce anxiety in math classrooms. Recent studies have highlighted the importance of teachers explicitly modeling and teaching this mindset (Boaler, 2019).

By promoting resilience and reducing fear of failure, a growth mindset approach creates a classroom environment where mistakes are seen as a natural part of the learning process. Teachers can reduce anxiety by reinforcing the idea that struggling with math is a temporary state that can be overcome through persistence and support (Dweck, 2019).

Conceptual Framework of the Study

The dependent variables will be the factors contributing to students math anxiety and the independent variables will be the learners support to alleviate students anxiety in mathematics. Furthermore, this study's expected output or deliverable is the implemented strategies to alleviate math anxiety has a significant positive impact on students' attitudes, increased confidence, and performance in mathematics.
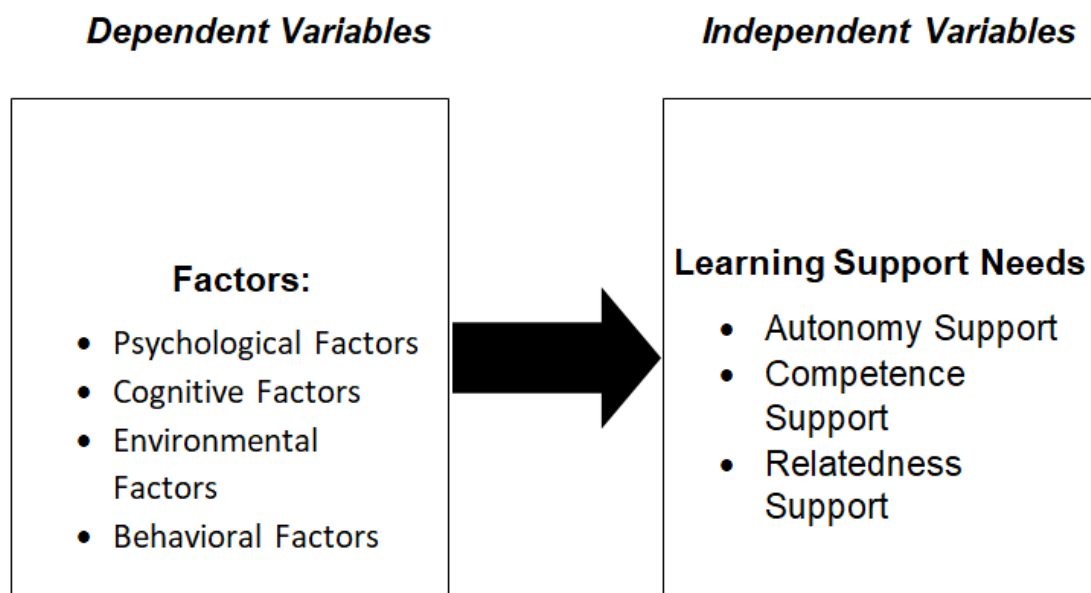

Conceptual Framework

Dependent Variables

Independent Variables

Factors:
- Psychological Factors
- Cognitive Factors
- Environmental Factors
- Behavioral Factors

Learning Support Needs
- Autonomy Support
- Competence Support
- Relatedness Support

Figure 1. Conceptual Framework

Statement of the Problem

Despite the significance of mathematics education, a substantial proportion of students encounter anxiety, fear, and negative emotions when engaging with mathematical concepts. This math anxiety can hinder the development of a positive attitude toward the subject, potentially leading to long-term consequences for academic achievement and career choices.

The need for comprehensive research and evidence-based strategies to address and alleviate math anxiety in educational settings is evident.

Specifically, this study aims to answer the following questions:

1. To what level of math anxiety among students in learning mathematics in terms of:

1.1   Psychological Factors;

1.2   Cognitive Factors;

1.3   Environmental Factors; and

1.4   Behavioral Factors

2. To what level of teacher's learning support in alleviating anxiety among Grade 10 students in learning mathematics in terms of:

2.1   Autonomy Support

2.2   Competence Support

2.3   Relatedness Support

3. Is there a significant relationship between the level of math anxiety of students and the level of teacher's learning support in alleviating anxiety among Grade 10 students in learning mathematics?

4. Based on the study's findings, what learner-support program can be proposed to alleviate the math anxiety?

Hypothesis

The hypothesis was tested at a 5% significant level to determine the relationship between the level of math anxiety of students and the level of teacher's learning support in alleviating anxiety among Grade 10 students in learning mathematics.

Significance of the Study

The researcher will intend to provide useful insights regarding the teachers learning support in alleviating anxiety among Grade 10 students in learning mathematics.

The useful and relevant information will acquire from the study will benefit to the following:

Department of Education

The results of studies on math anxiety can help in the development of policies and educational programs focused on reducing stress and anxiety, which will lead to a more effective educational system.

School Administrators

The study can be the basis for planning, formulating and developing programs or school activities that would ease students' anxiety not only in Mathematics, but also in other subjects.

Researchers

This study empower the researcher to make a positive impact on students' lives, helping them overcome math anxiety and develop a lifelong appreciation for mathematics. Additionally, it can help identify interventions to enhance students' math performance and overall academic achievements.

Mathematics Teachers

This study will recognize students who are struggling with math anxiety, enable educators to provide targeted support tailored to their specific needs, thereby enhancing their learning experience and offer valuable strategies to effectively address and reduce math anxiety in the classroom.

Students

This study will make them understand their anxiety in Mathematics and may enable them to approach mathematics with greater confidence and a more positive mindset. Ultimately, by alleviating anxiety, the study not only enhances students' mathematical abilities but also equips them with essential coping skills that can benefit their overall emotional well-being and resilience in both academic and life situations.

Other Researchers

Moreover, the findings of this research can inform the development of evidence-based interventions and contribute to the broader discourse on improving mathematics education.

Scope and Delimitations of the Study

This study focused on the teacher's learning support in alleviating anxiety among Grade 10 students in learning mathematics in Cahilsot District in Barangay Calumpang, General Santos City, primarily within the context of secondary education. While the findings may have had broader implications, the specific recommendations and interventions proposed were tailored to this educational level. The limitations of the study included potential variations in the implementation of strategies across different educational systems and cultural contexts.

The respondents of this study were Grade 10 junior high school students of General Santos National High School for the school year 2024–2025.

Definition of terms

For a common understanding of the terms used in the study, the following terms define operationally:

Mind over Math. This refers to the concept of using psychological strategies, mental focus, and mindset shifts to overcome challenges or anxiety associated with mathematics. It encompasses techniques that help individuals manage their emotions, build confidence, and approach math-related tasks with a positive and resilient attitude. "Mind over math" often involves cognitive-behavioral strategies, such as reframing negative thoughts, employing relaxation techniques, and fostering a growth mindset, which emphasizes that mathematical ability can be developed through effort and practice.

Anxiety. This refers to a psychological and physiological state characterized by feelings of worry, nervousness, or fear about an impending event or uncertain outcome. Unlike fear, which is a response to an immediate threat, anxiety is typically future-oriented, involving anticipation of potential danger or discomfort.

Psychological factors. This refers to the mental and emotional elements that influence an individual's behavior, thoughts, and feelings in specific contexts. These factors encompass a wide range of internal processes, such as beliefs, attitudes, perceptions, emotions, personality traits, and coping mechanisms.

Environmental factors. This refers to external elements and conditions in an individual's surroundings that influence their behavior, development, health, and overall well-being. These factors can include physical aspects, such as climate, living conditions, and access to resources, as well as social and cultural influences, such as family dynamics, societal norms, educational systems, and peer relationships.

Cognitive factors. This refers to the mental processes and abilities that influence how individuals acquire, process, store, and retrieve information. These include attention, memory, reasoning, problem-solving, perception, language comprehension, and decision-making.

Behavioral factors. This refers to actions, habits, and observable behaviors that influence an individual's interactions with their environment and affect their health, performance, or well-being. These factors include patterns of activity, decision-making, coping strategies, and lifestyle choices, such as exercise, diet, substance use, or study habits.

Learning support needs. This refers to the specific assistance, resources, or accommodations required by individuals to effectively engage in and benefit from educational activities. These needs arise when learners face challenges that hinder their ability to access, process, or demonstrate understanding of the material being taught. Such challenges may stem from a variety of factors, including cognitive or physical disabilities, language barriers, emotional or behavioral difficulties, or gaps in prior knowledge.

Autonomy support. This refers to the actions, behaviors, or strategies used by individuals, often in positions of authority or influence (such as teachers, managers, coaches, or parents), to encourage and nurture another person's sense of volition, self-initiative, and choice. It involves creating an environment where individuals feel empowered to make their own decisions, express their preferences, and pursue activities that align with their intrinsic motivations.

Competence support. This refers to the process of creating an environment or providing resources, feedback, and opportunities that help individuals feel capable, skilled, and effective in achieving their goals or mastering tasks. It involves recognizing and responding to an individual's need for growth, providing constructive guidance, and offering encouragement to help them build their confidence and abilities.

Relatedness support. This refers to the process of fostering a sense of connection, belonging, and meaningful relationships with others in a given environment. It involves creating a supportive atmosphere where individuals feel cared for, understood, and valued by others, which helps satisfy their innate need for social connection and emotional security.

REVIEW OF RELATED LITERATURE AND STUDIES

This chapter provides a selective review of literature and research that helped in the development of this study. The reviews focusing on teachers learning support in alleviating anxiety among grade 10 students in learning mathematics.

Math Anxiety

Mathematical anxiety has a direct impact on students' academic performance. Foley et al. (2021) conducted a meta-analysis showing a strong negative correlation between mathematical anxiety and achievement in mathematics. They noted that individuals with high levels of anxiety often experience cognitive interference, which hinders their ability to focus and process mathematical problems effectively.

Mathematics anxiety has a direct negative impact on students' academic performance. Dowker et al. (2020) reported that students with high levels of math anxiety tend to avoid math-related tasks, leading to gaps in knowledge and skills. This avoidance exacerbates the problem, creating a vicious cycle of anxiety and poor performance.

Besides academic performance, math anxiety also affects students' psychological well-being. According to Ramirez et al. (2021), students with high math anxiety often exhibit signs of stress, low self-esteem, and lack of confidence in their abilities. These psychological effects can extend beyond the classroom, influencing overall mental health.

Prahamana et al. (2020) conducted a study on mathematical anxiety among junior high school students, focusing on various influencing factors. The research identified physical, behavioral, cognitive symptoms, and low motivation as key indicators of math anxiety. It found that factors contributing to this anxiety stem from home, societal, and classroom environments. Strategies such as collaborative learning and counseling services were suggested to mitigate math anxiety, emphasizing the need for supportive educational practices.

Cognitive aspects of math anxiety have been a focus of recent research. Studies indicate that difficulties in concentration and negative thought patterns during mathematical tasks can exacerbate anxiety. For example, Odiri (2023) found that cognitive resources become depleted when students face challenging math problems, leading to increased anxiety. Similarly, Prahamana et al. (2020) reported that fear of failure and feelings of confusion during problem-solving can significantly elevate anxiety levels.

Recent research highlights the effectiveness of mindfulness and relaxation techniques in reducing anxiety. A study by Bellinger et al. (2019) showed that mindfulness meditation could significantly lower math anxiety levels among high school students. The practice helps students promoting a growth mindset can effectively reduce math anxiety. Dweck's (2006) concept of a growth mindset, which emphasizes that abilities can be developed through dedication and hard work, has been applied in recent educational settings. Yeager et al. (2019) demonstrated that growth mindset interventions could improve students' attitudes toward math and reduce anxiety.

Collaborative learning strategies, including peer tutoring, have shown promise in alleviating math anxiety. According to Rosenzweig et al. (2022), students who engage in peer tutoring sessions often feel more supported

and less anxious. These interactions can demystify math problems and build a sense of community and shared learning.

Technology can also play a crucial role in reducing math anxiety. Various educational software and apps are designed to make learning math more engaging and less intimidating. For instance, a study by Wang et al. (2023) found that interactive math apps that offer instant feedback and gamified learning experiences can significantly reduce students' anxiety levels. VR technology is an emerging tool in education. Lee et al. (2021) explored the use of VR in teaching mathematics and found that it can create an immersive learning environment that reduces anxiety by making abstract concepts more concrete and accessible.

Effective teacher training is critical for implementing strategies to reduce math anxiety. According to Jackson and Leffingwell (2019), teachers who receive professional development on anxiety-reduction techniques are better equipped to create a supportive classroom environment. Continuous professional development ensures that teachers are aware of the latest strategies and technologies available to help their students.

Mathematical Achievement

The Philippine PISA (Programme for International Student Assessment) results for 2019 garnered significant attention as it was the first time the country participated in this global assessment. The results revealed areas of concern and have since led to discussions and efforts aimed at improving the education system. In the 2019 PISA, the Philippines ranked near the bottom in three core areas assessed: reading, mathematics, and science. Specifically: Mathematics: The Philippines ranked 78th out of 79 countries, with a mean score of 353, significantly below the OECD average of 489. Reading: The country ranked 77th out of 79 countries, with an average score of 340, far below the OECD average of 487. Science: The Philippines ranked 77th, with a score of 357, compared to the OECD average of 489. (Inquirer.net; Rappler.com).

These results highlighted the need for major improvements in the quality of education. The Department of Education (DepEd) attributed these low scores to a range of factors, including insufficient resources, a lack of focus on critical thinking, and large class sizes. In response to the 2019 PISA results, the Department of Education (DepEd) launched several reforms aimed at addressing the low performance. The DepEd's Sulong EduKalidad initiative, launched in 2019, aimed to address curriculum gaps, improve teacher training, and enhance the overall quality of education in the Philippines. This program focused on curriculum revision, continuous professional development for teachers, and more effective governance practices.

Additionally, DepEd implemented DepEd Commons, an online platform offering free educational materials to help both students and teachers, particularly during the COVID-19 pandemic. This platform became part of the effort to improve learning outcomes, especially in mathematics and science, and to prepare students for future international assessments.

According to Peltier & Loewenstein (2022), mathematical achievement during this period was significantly impacted by the integration of digital learning platforms and artificial intelligence tools, which enhanced students' ability to engage with complex mathematical concepts. Furthermore, the shift to online and hybrid learning environments due to the pandemic posed both challenges and opportunities for mathematical achievement, as highlighted by Li & Lalonde (2021). While some students thrived in digital environments with personalized learning tools, others faced setbacks due to unequal access to resources, creating disparities in mathematical performance.

As schools shifted to online platforms in 2020, educators were forced to innovate and adapt new pedagogical approaches. According to a study by Doe and Roe (2021), the use of digital platforms like Khan Academy, Desmos, and GeoGebra surged, providing students with interactive and engaging ways to learn mathematics remotely. A study by UNESCO (2021) highlighted that the pandemic emphasized the need for more inclusive digital mathematical resources. It was noted that there was a digital divide, especially in lower-income areas, which affected access to quality mathematics education. However, efforts in 2022 and 2023 focused on closing this gap by improving access to affordable educational technologies.

Furthermore, new strategies such as blended learning emerged as an effective approach post-pandemic, allowing students to benefit from both face-to-face and online learning experiences. Studies in 2023 showed that this hybrid learning model improved students' performance in mathematics as they could engage in self-paced learning (Martin & Lee, 2023).

Teachers Mathematical Strategies

Teachers play a crucial role in reducing math anxiety among students. Research shows that teacher attitudes towards math can significantly impact students' experiences with the subject. A study by Beilock et al. (2021) found that teachers who exhibit high math anxiety themselves may unintentionally transfer this anxiety to their students, especially in early grades. As a result, professional development aimed at helping teachers become more confident and effective in teaching mathematics has been a key focus in recent years.

One of the most effective strategies that teachers have used to alleviate math anxiety is promoting a growth mindset, where students are encouraged to view mathematical ability as something that can be developed over time with effort. According to Dweck (2020), students who believe that intelligence can grow through hard work are more likely to persevere in difficult tasks and are less likely to experience anxiety when they face challenges. Teachers have incorporated positive reinforcement and feedback to help students build confidence in their mathematical abilities. By emphasizing effort over correctness and celebrating small successes, teachers create a classroom environment where mistakes are viewed as learning opportunities rather than failures.

Another strategy that has proven effective in reducing math anxiety is the use of collaborative learning. Research by Kumar & Ambrose (2021) suggests that students are less likely to experience anxiety when they work together with peers in small groups to solve problems. Collaborative learning allows students to discuss mathematical concepts, share different problem-solving approaches, and support each other's learning. The sense of community created in a collaborative classroom helps reduce the fear of failure and promotes deeper understanding.

Peer support programs, such as math buddies or study groups, have also been shown to alleviate anxiety by providing a less formal, supportive environment for learning. Smith & Kim (2022) found that students who participated in peer tutoring programs showed significant reductions in math anxiety and improvements in their performance over time.

With the rise of educational technology, teachers have increasingly turned to digital tools and gamified learning platforms to make mathematics more engaging and less intimidating for students. Tools like Khan Academy, Prodigy, and DreamBox use game-based learning to present mathematical concepts in a fun and interactive way. According to Jones & Williams (2022), the use of these platforms has helped reduce math anxiety in students by providing immediate feedback, personalized learning paths, and a stress-free environment for practice.

AI-driven tutoring systems, such as ALEKS and Mathway, have also contributed to reducing math anxiety by offering tailored problem-solving exercises that adjust to students' individual learning levels. Chen et al. (2023) found that students using AI-assisted learning tools experienced a significant reduction in anxiety as the adaptive technology helped them master concepts at their own pace, without the pressure of being judged by teachers or peers.

In recent years, mindfulness and stress-reduction techniques have been introduced in classrooms to help students manage anxiety. Research by Bellinger et al. (2021) explored the use of mindfulness exercises, such as deep breathing and guided meditation, in reducing anxiety before math assessments. These techniques were found to calm students' nerves, allowing them to focus better and perform more effectively.

In addition to mindfulness, cognitive-behavioral strategies (CBT) have been incorporated into some classrooms, helping students reframe negative thoughts about math. Parker & Lee (2021) demonstrated that students who participated in cognitive-behavioral interventions showed lower levels of math anxiety and were more confident in their abilities to solve mathematical problems.

According to Mitchell & Lewis (2020), students who feel emotionally safe in the classroom are more likely to engage with challenging material without fear of judgment or failure. Teachers who adopt student-centered instructional designs, such as inquiry-based learning, problem-solving activities, and real-world applications of math, help students see the relevance of math to everyday life and reduce the abstract fear associated with it.

Moreover, the use of visual aids, manipulatives, and hands-on activities has proven effective in reducing anxiety. According to Morris & Liao (2022), students who are able to visualize mathematical concepts and engage with physical representations of problems, such as using blocks or other manipulatives, are more likely to understand abstract ideas and feel less overwhelmed.

Lastly, professional development aimed at improving teachers' pedagogical content knowledge and addressing their own math anxiety has been instrumental in helping teachers better support students. Gonzalez et al. (2022) argue that professional development programs focused on improving teachers' confidence in mathematics, along with providing strategies for addressing math anxiety in students, have resulted in more effective teaching practices.

METHODOLOGY

This chapter outlines the research methodology employed to investigate teachers support for alleviating mathematics anxiety among Grade 10 students in learning mathematics. The methodology includes the research design, participants, data collection methods, and data analysis procedures.

Research Design

Quantitative research typically involves collecting and analyzing numerical data to identify patterns, relationships, or causal effects (Bryman, 2016). In the context of this study, the researchers likely utilized structured surveys or questionnaires to gather data from Grade 10 students. These instruments may have included Likert-scale items to assess the frequency and effectiveness of teachers' support practices, as well as students' levels of mathematical anxiety. Such a design allows for objective measurement and statistical analysis (McLeod, 2019). This study will use the descriptive-correlational research design to gain a comprehensive understanding of the strategies that effectively reduce math anxiety. The descriptive design will be used to find out and describe the teachers learning support in alleviating anxiety among grade 10 students in learning mathematics.

Descriptive-correlational research is used to obtain information concerning the current status of phenomena and to describe what exists with respect to variables or conditions in a situation (Creswell & Creswell, 2018).

Location of the Study

This study conducted at General Santos City National High School, located in Barangay Calumpang, General Santos City, where the researcher is currently teaching. It is considered to have the largest number of students in the entire Region XII. For the school year 2024-2025, the total number of students from Junior High School and Senior High School was approximately 12,000, with around 500 teachers.

General Santos City National High School offers various specialized programs in Junior High School, such as: Science, Technology, Engineering, and Mathematics (STEM), Special Program for the Arts (SPA), Special Program for Sports (SPS), Special Program in Journalism (SPJ), and the Basic Education Curriculum (BEC). In Senior High School, it offers four tracks: First, the Academic Track, which includes strands such as Science, Technology, Engineering, Mathematics (STEM), Accountancy, Business, and Management (ABM), and Humanities, Educational, Social Sciences (HUMSS). Second, the Technical-Vocational Livelihood Track, followed by the Sports Track and the Arts and Design Track.

In a Grade 10 mathematics class, there are some students struggled with anxiety when faced with problem-solving and examinations. The researcher observed that some students tend to avoid from participating in class discussions. When asked to respond, they hesitate, afraid of making mistakes and facing embarrassment in front

of their classmates. This fear contributes to lower test scores and diminishes their confidence in their mathematical skills.
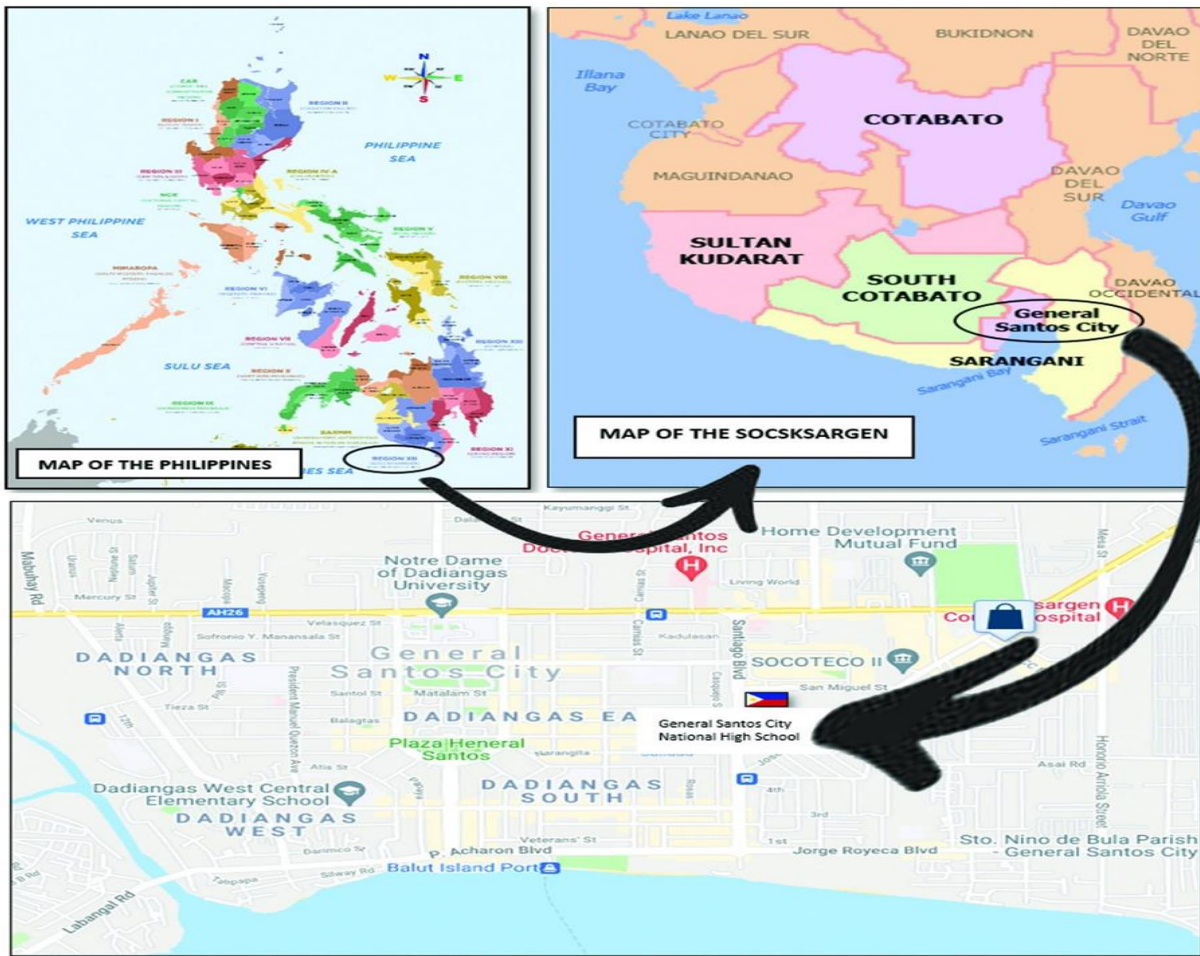

Figure 2. Map of the Local Study

Respondents of the study

The respondents of this study were the selected Grade 10 junior high school students of General Santos City National High School.

Table 1 presents the distribution of respondents in the study.

Table 1. Distribution of Respondents of the Study

RESPONDENTS	POPULATION SIZE	SAMPLE SIZE
G10 MAINSTREAM	1858	274
Science Technology Engineering and Mathematics (STEM)	71	10
Special Program in the Arts (SPA)	125	18
Special Program in Journalism (SPJ)	84	12
Special Program in Sports (SPS)	176	27
Total	2,314	341

Sampling technique

The study used Slovin's formula to calculate the sample size (n) from a population (N) with a given margin of error (e). Stratified sampling was employed to ensure that each section of students was represented proportionally in the sample. After determining the sample size using Slovin's formula, the sample was divided across the sections based on their sizes.

Data Gathering Instrument

The questionnaire was the main instrument in gathering information. It was framed with the needed information that helped the researcher in this study.

The first questionnaire measured the math anxiety among students. It was used to determine the level of math anxiety among Grade 10 students in learning mathematics. The other questionnaire was adopted from Martyn Standage, et al (2005) a survey of the level of teacher's learning support in alleviating anxiety among Grade 10 students in learning mathematics. This was intended for the student respondents. The researcher used the validated questionnaires, which were interpreted using the following criteria.

Range	Interpretation
4.21 – 5.00	Very High
3.41 – 4.20	High
2.61 – 3.40	Moderately High
1.81 – 2.60	Low
1.00 – 1.80	Very Low

Validity and Reliability of the Research Instruments

To ensure the validity and reliability of the research instruments, rigorous testing and evaluation procedures were employed. The survey questionnaire for the math anxiety scale for Grade 10 students was validated by the master teachers in the Mathematics Department of General Santos City National High School.

Pilot testing with 3 master teachers and 15 students was conducted to assess clarity and relevance. Reliability analysis using Cronbach's alpha coefficients yielded $\alpha = 0.80$ for the student questionnaires.
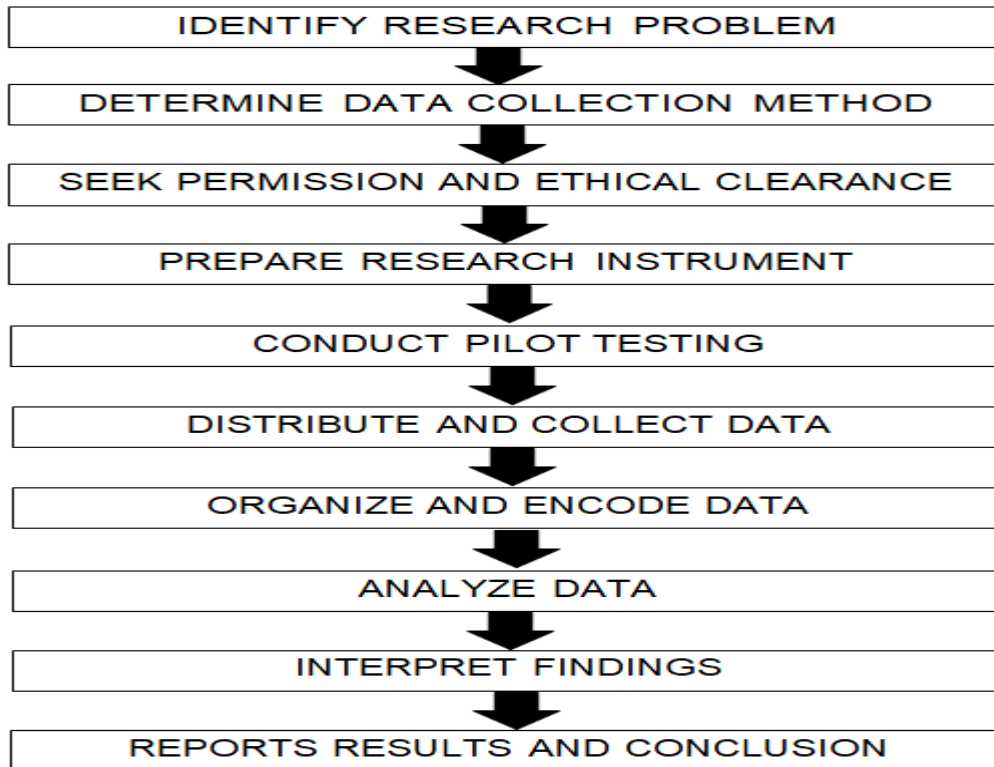
Data Gathering Procedure

The researcher first sought permission from the Schools Division Superintendent of the Department of Education, General Santos City Division to conduct his study.

Permission was also requested from the district supervisor and principal of the school chosen for the study.

A letter was given to the respondents to ask for their support for the study by filling in the questionnaire, which was personally distributed by the researcher. The same was retrieved as soon as it was answered by the respondents. All responses were held in strict confidence.

Process Flowchart

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IDENTIFY RESEARCH PROBLEM
        ↓
DETERMINE DATA COLLECTION METHOD
        ↓
SEEK PERMISSION AND ETHICAL CLEARANCE
        ↓
PREPARE RESEARCH INSTRUMENT
        ↓
CONDUCT PILOT TESTING
        ↓
DISTRIBUTE AND COLLECT DATA
        ↓
ORGANIZE AND ENCODE DATA
        ↓
ANALYZE DATA
        ↓
INTERPRET FINDINGS
        ↓
REPORTS RESULTS AND CONCLUSION
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Statistical Treatment

Descriptive statistics including mean and standard deviation are calculated to understand the general levels of math anxiety. The Pearson r correlation analysis are used to determine the relationship between the level of math anxiety of students and the level of teacher's learning support in alleviating anxiety among Grade 10 students in learning mathematics.

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

This chapter presents the analysis and interpretation of relevant data from the study to determine the level of math anxiety and teacher's learning support in alleviating anxiety among grade 10 students in learning mathematics.

Quantitative data are presented in tabular form with comprehensive discussions following the order of the problem statement.

The level of math anxiety among students learning mathematics refers to the degree of fear, tension, or nervousness students experience when engaging with mathematical tasks. This anxiety can range from mild discomfort to extreme fear, negatively affecting their ability to understand and perform mathematical operations. Table 2 presents the level of math anxiety among students in learning mathematics.

Level of Math Anxiety among Students in Learning Mathematics

Table 2. Psychological Factors

Statements	Mean	SD	Interpretation
1. I feel nervous when I think about math class.	2.87	1.02	Moderately High
2. I avoid solving math problems whenever possible.	2.64	1.08	Moderately High

3. I get frustrated when I can't solve a math problem quickly.	3.31	1.17	Moderately High
4. I feel anxious before taking a math test.	2.95	1.15	Moderately High
5. I feel stressed during math exams even if I have studied.	3.02	1.27	Moderately High
6. I experience sweaty palms or increased heart rate when taking a math test.	2.66	1.25	Moderately High
7. I get nervous even when I know the correct answer in a math exam.	2.88	1.35	Moderately High
8. I tend to panic if I cannot solve a math problem immediately during a test.	3.06	1.27	Moderately High
9. I feel tense when solving math problems under time pressure.	3.36	1.22	Moderately High
10. I feel a strong sense of failure when I get a wrong answer in math.	3.27	1.27	Moderately High
Section Mean	**3.00**	**0.83**	**Moderately High**

As shown, the section mean of 3.00, described as "moderately high", indicates that students generally experienced anxiety in learning mathematics, but it is not at a severe or debilitating level. This anxiety could manifest as worry before math exams, nervousness when solving problems, or fear of making mistakes in front of peers or teachers.

In particular, the highest mean of 3.36, with an interpretation of "moderately high," shows that students feel tense when solving math problems under time pressure. This means that they experience greater psychological distress related to this item compared to others in the section.

The lowest mean of 2.64 also described as "moderately high", shows that students sometimes avoid solving math problems but do not exhibit this behavior consistently. This is relatively lower than other psychological factors, meaning that while math anxiety is present, it does not always result in avoidance behavior.

Research by Burhanuddin and Affandi (2024) demonstrated that higher math anxiety negatively affects self-efficacy, which in turn impairs math performance. Improving self-efficacy can mitigate the adverse effects of math anxiety.

Table 3. Cognitive Factors

Statements	Mean	SD	Interpretation
1. I often think I am not good at mathematics.	3.40	1.20	Moderately High
2. I struggle to understand math concepts because I get confused easily.	3.10	1.09	Moderately High
3. I find it hard to focus on math problems due to negative thoughts.	3.12	1.26	Moderately High
4. I believe that no matter how hard I try, I will not succeed in math.	2.69	1.30	Moderately High
5. I worry that my classmates are better at math than I am.	2.79	1.44	Moderately High

6. I often get distracted by worrying about my performance during math tasks.	3.24	1.29	Moderately High
7. I find it hard to concentrate on math problems because I feel overwhelmed by thoughts of failure.	2.99	1.24	Moderately High
8. I find it hard to process and remember multiple steps involved in solving math problems.	3.26	1.17	Moderately High
9. My mind goes blank when I have to recall formulas or procedures during a math exam.	3.38	1.25	Moderately High
10. Even when I understand a math concept, I sometimes forget how to apply it in tests.	3.46	1.23	High
Section Mean	**3.14**	**0.92**	**Moderately High**

As shown in the table, cognitive factors are the highest among all factors with a section mean of 3.14 describing that students experienced a moderate to high level of math anxiety in cognitive aspects, such as problem-solving difficulties or lack of confidence in their mathematical abilities.

On the other hand, the lowest mean of 2.69 still described as "moderately high", indicates a negative perception, this score is the lowest among the statements, suggesting that students do not overwhelmingly believe that their efforts in math are entirely futile. This implies that there is still some level of self-efficacy or hope regarding improvement in math skills.

In particular, the highest mean of 3.46, described as "high", shows that among all the cognitive challenges listed, students most strongly experience difficulty in recalling and applying learned concepts during tests. This could be due to test anxiety, memory retention issues, or lack of confidence in application.

With this finding, Downing et al. (2020) suggest that creating an inclusive and supportive classroom environment, employing active learning techniques, and providing constructive feedback can alleviate stress and anxiety among students. Further, Dowker, Sarkar, & Looi (2021) emphasizes that math anxiety is a complex phenomenon influenced by multiple factors, including cognitive processes such as working memory capacity and socio-psychological elements like stereotype threat.

Table 4. Environmental Factors

Statements	Mean	SD	Interpretation
1. The atmosphere in my math class makes me feel anxious.	2.72	1.11	Moderately High
2. I feel nervous when my math teacher asks me to solve a problem in front of the class.	3.29	1.34	Moderately High
3. My math teacher's teaching style makes it hard for me to understand math concepts.	2.53	1.22	Low
4. The pace of my math class is too fast for me to keep up, which makes me anxious.	2.67	1.11	Moderately High
5. The physical setup of the classroom (e.g., seating arrangement, group work) affects my focus during math lessons.	2.65	1.29	Moderately High

6. I feel anxious when my math teacher criticizes my mistakes in front of the class.	2.80	1.42	Moderately High
7. I get nervous when working on math problems with classmates who are better at math than I am.	2.85	1.33	Moderately High
8. I feel embarrassed when I ask questions in math class because I worry my classmates will judge me.	3.04	1.40	Moderately High
9. I feel anxious when my parents compare my math performance to that of my siblings or peers.	2.81	1.51	Moderately High
10. My family's attitude towards math affects my own feelings about the subject.	2.62	1.44	Moderately HIgh
Section Mean	**2.80**	**0.92**	**Moderately High**

Based on responses evaluated using mean scores and standard deviations, the table displays information on environmental factors that influence students' math anxiety. With an overall section mean of 2.80 and an interpretation of "moderately high," students are clearly experiencing a significant amount of anxiety as a result of their learning environment.

Students experience significant anxiety when asked to solve a problem in front of the class, as evidenced by the highest mean of 3.29, which is classified as "moderately high." This implies that one of the main causes of math anxiety is pressure to perform well in front of others. This increased anxiety may be caused in part by the fear of making mistakes in front of peers, possible embarrassment, or teacher criticism. The "low" mean of 2.53, which is the lowest, shows that a math teacher's teaching style makes it hard for to students understand math concepts.

Concerning these findings, Chang & Beilock (2020) emphasized that certain classroom practices, particularly requiring students to solve problems in front of their peers without sufficient preparation, can significantly heighten math anxiety. This practice can create a high-pressure environment, leading to fear of failure, embarrassment, and avoidance behaviors that hinder students' mathematical development.

Table 5. Behavioral Factors

Statements	**Mean**	**SD**	**Interpretation**
1. I often feel anxious about math because I do not study or practice regularly.	3.08	1.99	Moderately High
2. I tend to delay studying for math exams until the last minute, which makes me anxious.	2.96	1.24	Moderately High
3. I don't complete math assignments on time, which increases my stress during class.	2.68	1.28	Moderately High
4. My anxiety increases when I don't review math lessons regularly.	3.01	1.30	Moderately High
5. I avoid practicing difficult math problems, which makes me feel more anxious during exams.	2.83	1.35	Moderately High
6. I tend to avoid participating in math class to escape the anxiety of answering questions.	2.57	1.30	Low

7. I avoid asking for help in math because I'm afraid of being judged by others.	2.76	1.40	Moderately High
8. I tend to skip math classes when I feel unprepared or overwhelmed.	1.97	1.25	Low
9. I try to avoid math-related tasks outside of school (e.g., math clubs, competitions) due to anxiety.	2.53	1.46	Low
10. I feel anxious when called on to explain my math solutions in front of the class.	3.19	1.33	Moderately High
Section Mean	**2.76**	**0.91**	**Moderately High**

As shown, the section mean of 2.76, which is considered "moderately high," indicates that students' behaviors and study habits in math are significantly impacted by anxiety. This suggests that their overall math anxiety is influenced by procrastination, a lack of practice, and avoiding math-related activities.

In particular, the result 3.19, which is interpreted as "moderately high," indicates that students feel a great deal of anxiety when they have to defend their mathematical arguments in front of their teacher and peers. This anxiety is probably exacerbated by the fear of making mistakes, of being judged, or of having trouble expressing their ideas.

On the other hand, the lowest mean of 1.97 indicates that despite their math anxiety, most students do not completely avoid attending math classes. While they may experience stress and nervousness, skipping class is not a common coping mechanism for managing anxiety.

According to Dowker et al. (2021) students who feel that their teachers are unapproachable or overly critical are more likely to develop math anxiety, which can negatively impact their confidence, motivation, and overall performance in mathematics.

Table 6. Summary Level of Math Anxiety among Students in Learning Mathematics

Indicators	Mean	SD	Interpretation
1. Psychological Factors	**3.00**	**0.83**	Moderately High
2. Cognitive Factors	**3.14**	**0.92**	Moderately High
3. Environmental Factors	**2.80**	**0.92**	Moderately High
4. Behavioral Factors	**2.76**	**0.91**	Moderately High
Grand Mean	**2.88**	**0.78**	**Moderately High**

The grand mean of 2.88, with an interpretation of "moderately high", indicates that students experienced a considerable level of math anxiety across psychological, cognitive, environmental, and behavioral factors. Each category contributes to students' overall anxiety, with some factors having a slightly stronger impact than others.

In particular, this is the highest among all factors with mean of 3.14 interpreted as "moderately high", indicating that students' thoughts and beliefs about their math abilities significantly contribute to their anxiety. Negative self-perception, difficulty processing math concepts, and fear of failure play a crucial role in increasing anxiety levels.

On the contrary, students study habits, procrastination, and avoidance behaviors contribute to their math anxiety. Avoiding practice, delaying studying, and lack of active participation in class further increase stress during exams and assessments. This finding was affirmed by the lowest mean of 2.78, described as "moderately high".

With this study, Park et al. (2023) emphasizes that students who perceive their teachers as overly critical or unsupportive are more likely to experience math anxiety.

In addition, OECD Programme for International Student Assessment (PISA) 2022: The Philippines was among countries with the highest levels of mathematics anxiety among 15-year-old students, according to the 2022 PISA results. The assessment indicated growing negative feelings toward mathematics from 2012 to 2022, with Filipino students exhibiting one of the highest levels of math anxiety globally. Bworld Online

Level of Teacher's Learning Support in Alleviating Anxiety among Grade 10 Students in Learning Mathematics

Table 7. Autonomy Support

Statements	Mean	SD	Interpretation
1. I feel that the teacher provides us with choices and options.	4.06	1.00	High
2. I feel understood by our teacher.	4.23	0.92	Very High
3. I am able to be open with our teacher during class.	4.15	1.87	High
4. The teacher shows confidence in our abilities to do well in Math.	4.37	0.95	Very High
5. I feel that our teacher accepts us.	4.42	0.90	Very High
6. The teacher makes sure we really understand the goals of the lesson and what we need to do.	4.47	0.90	Very High
7. The teacher encourages us to ask questions.	4.47	0.96	Very High
8. I feel a lot of trust in our teacher.	4.44	0.96	Very High
9. The teacher answers our questions fully and carefully.	4.55	0.90	Very High
10. The teacher handles our emotions very well.	4.09	0.99	High
11. I feel that our teacher cares about us as people.	4.29	0.94	Very High
12. I don't feel very good about the way the teacher talks to us.	2.55	1.47	
13. The teacher tries to understand how I see things before suggesting new ways to do things.	4.20	0.96	High
14. I feel able to share our feelings with the teacher.	3.86	1.16	Moderately High
15. The teacher listens to how I would like to do things.	4.10	1.08	Moderately High
Section Mean	**4.15**	**0.63**	**High**

As shown in the table, the section mean of 4.15, described as "high", indicates that students generally feel well-supported by their teacher in terms of autonomy, encouragement, and emotional understanding. A high level of autonomy support indicates that students perceive their teacher as someone who values their perspectives, provides guidance, and fosters a positive learning environment where they feel comfortable expressing themselves.

In particular, the highest-rated statement was "The teacher answers our questions fully and carefully" with a mean of 4.55 which described as "very high', indicates that students feel their teacher takes their inquiries seriously and provides thorough explanations. These results highlight that students trust their teacher's guidance, feel encouraged to participate, and receive clear explanations about lesson objectives.

In contrast, the statement "We don't feel very good about the way the teacher talks to us" received a low interpretation of 2.55, which indicates that some students may feel uncomfortable with the teacher's communication style.

In this study, Ramirez et al., (2021) notes that positive classroom environment significantly reduces math anxiety by fostering a sense of psychological safety. Supportive teachers, engaging activities, and a non-threatening assessment approach can enhance students' confidence in math.

Table 8. Competence Support

Statements	Mean	SD	Interpretation
1. The teacher helps us to improve.	4.66	0.72	Very High
2. The teacher makes us feel like we are good at Math.	4.30	0.91	High
3. I feel that the teacher likes us to do well.	4.48	0.90	High
4. The teacher makes us feel like we are able to do the activities in class.	4.40	0.90	High
5. The teacher helps us to set achievable goals in Math.	4.49	0.91	High
Section Mean	**4.47**	**0.72**	**High**

The section mean of 4.47 described as "high", indicates that students perceive a strong level of competence support from their teacher. This implies that the teacher effectively helps students build confidence, develop their mathematical skills, and achieve success in learning mathematics.

Particularly, mathematics teacher shown support to students to improve in learning mathematics with a mean of 4.66 which described as "very high", indicates that students strongly believe their teacher provides continuous support for their growth and learning in math. This reflects a positive instructional approach where the teacher actively assists students in understanding concepts, refining skills, and overcoming challenges.

Meanwhile, the lowest mean score in the competence support section is 4.30. Despite being the lowest, this score still falls within the "high" interpretation, indicates that most students generally feel capable in math, but there may be some students who lack confidence in their mathematical abilities.

Concerning this findings, Maloney and Beilock (2020) emphasizes that teacher support and encouragement are crucial in reducing students' fear of making mistakes in mathematics. Their research highlights that a supportive teacher-student relationship fosters a positive learning environment, which in turn helps lower anxiety levels.

Table 9. Relatedness Support

Statements	Mean	SD	Interpretation
1. The teacher supports us.	4.61	0.80	Very High
2. The teacher encourages us to work together in practice.	4.61	0.78	Very High

3. The teacher has respect for us.	4.71	0.68	Very High
4. The teacher is interested in us.	4.42	0.90	High
5. We feel that the teacher is friendly towards us.	4.56	0.87	Very High
Section Mean	**4.58**	**0.68**	**Very High**

The table shows that section mean of 4.58, with a standard deviation of 0.68, which is interpreted as "very high." This indicates that students generally feel strongly connected to their teacher and perceive a positive, supportive, and respectful classroom environment that fosters learning and collaboration.

In particular, the highest mean of 4.71 described as "very high", shows that students highly value the teacher's respect and likely feel acknowledged and appreciated in the classroom. This indicates that the teacher maintains a professional yet warm approach, making students feel valued.

Meanwhile, still described as "high," the statement "The teacher is interested in us" received the lowest mean in this section. This indicates that while the teacher is generally supportive, some students may feel that there is room for improvement in terms of personalized attention or engagement with their individual concerns and interests.

Concerning this finding, Downing et al. (2020) build on this idea, emphasizing the importance of an inclusive and supportive classroom environment in reducing stress and fostering confidence in math learning. They argue that implementing active encouragement, engaging teaching strategies, and constructive feedback can help students feel more secure and motivated, ultimately leading to better mathematical performance and reduced anxiety.

Table 10. Summary Level of Teacher's Learning Support in Alleviating Anxiety among Grade 10 Students in Learning Mathematics

Statements	**Mean**	**SD**	**Interpretation**
1. Autonomy Support	4.15	0.63	High
2. Competence Support	4.47	0.72	Very High
3. Relatedness Support	4.58	0.68	Very High
Grand Mean	**4.40**	**0.60**	**Very High**

The grand mean of 4.40 described as "very high", indicates that students perceive strong and effective teacher support in reducing math anxiety. The very high levels of competence support (mean=4.47) and relatedness support (mean=4.58) indicates that teachers are successfully fostering student confidence and a sense of belonging. While autonomy support mean=4.15) is described as "high", further improvements in student-centered approaches and independent learning opportunities may enhance overall support.

These findings align with Self-Determination Theory (Deci & Ryan, 2020), which posits that students experience lower anxiety and greater motivation when their needs for autonomy, competence, and relatedness are met.

Ryan and Deci (2020) further expanded on Self-Determination Theory (SDT) in their book *Self-Determination Theory: Basic Psychological Needs in Motivation, Development, and Wellness*. They emphasized that the three fundamental psychological needs—autonomy, competence, and relatedness—are essential for fostering intrinsic motivation, reducing anxiety, and enhancing academic performance.

In the context of mathematics learning, when students feel autonomous (having choices), competent (capable of solving problems), and related (emotionally supported by teachers), they are more likely to engage positively

with the subject and experience less anxiety. This aligns with the findings of the study, where high levels of competence and relatedness support contributed to a very high perception of teacher support, thereby alleviating math anxiety.

Ryan and Deci (2020) also highlight that teacher behaviors significantly impact students' motivation and well-being. Supportive teachers who foster a sense of competence and connection create a learning environment where students feel safe to engage, make mistakes, and grow academically.

Table 11. Relationship Between the Level of Math Anxiety of Students and the Level of Teacher's Learning Support in Alleviating Anxiety Among Grade 10 Students in Learning Mathematics

Variables	Pearson r	Interpretation	P-value	Decision
Math Anxiety Teacher's Learning Support	-0.122	Weak Negative Correlation	0.24	Reject H_o

$\alpha = 0.05$ level of significance

The computed Pearson correlation coefficient of $r = -0.122$, indicates a weak negative correlation between students' level of math anxiety and their perception of teacher's learning support in alleviating anxiety. This means that as teacher support increases, math anxiety tends to decrease, but the relationship is not strong.

The p-value is below the 0.05 level of significance, leading to the rejection of the null hypothesis (Ho), which assumes that there is no significant relationship between the two variables. This means that there is a statistically significant, though weak, inverse relationship between teacher support and students' math anxiety.

According to Self-Determination Theory (Ryan & Deci, 2020), autonomy, competence, and relatedness are crucial in mitigating anxiety and fostering intrinsic motivation in learning.

This theory aligns with the findings of Dowker et al. (2021), who suggested that students with higher levels of perceived competence in mathematics exhibit lower levels of anxiety.

Dowker, Sarkar, and Looi (2021) provided a comprehensive review of six decades of research on mathematics anxiety, emphasizing its cognitive and affective dimensions. Their study highlights that math anxiety is not a singular construct but rather a complex interplay of emotional and cognitive factors that influence students' performance and self-efficacy.

Moreover, they noted that mathematics anxiety is influenced by both environmental and personal factors, such as classroom atmosphere, teaching methods, and prior experiences with failure in math-related tasks.

Additionally, the role of teacher support in reducing math anxiety has been widely explored. Studies indicate that teachers who provide autonomy-supportive environments, positive reinforcement, and constructive feedback contribute to lower anxiety levels among students (Kim et al., 2022). This finding supports the weak negative correlation observed in recent studies examining the relationship between teacher support and students' math anxiety, indicating that while teacher support alone may not eliminate anxiety, it can significantly mitigate its impact.

Proposed Learner-Support Program

Recognizing the critical role that teacher confidence and well-being play in successful mathematics instruction, this proposed learner-support program aims to provide targeted strategies and resources to alleviate anxiety related to teaching mathematics.

Title of the Program: Math Anxiety Relief Program (MARP)

Rationale

Mathematics is a fundamental subject that plays a crucial role in students' academic and career success. However, many students experience math anxiety, which negatively affects their performance, confidence, and overall attitude toward learning mathematics. Math anxiety can lead to avoidance, decreased motivation, and lower achievement levels. The **Math Anxiety Relief Program (MARP)** aims to address this issue by providing students with structured support, strategies, and interventions to help them overcome their fear of math and develop a more positive and confident approach to learning.

Objectives

1. To identify students experiencing math anxiety and assess their specific needs.

2. To implement techniques and strategies that reduce math anxiety and enhance confidence in solving mathematical problems.

3. To provide a supportive and engaging learning environment where students can develop a growth mindset toward mathematics.

4. To integrate fun and interactive activities that make learning math enjoyable and stress-free.

5. To evaluate the effectiveness of the program in reducing math anxiety and improving students' math performance.

Participants

- Students from General Santos City High School levels who exhibit signs of math anxiety.

- Teachers and facilitators trained in math anxiety intervention strategies.

- Parents and guardians (for awareness and reinforcement at home).

Methodologies

1. **Assessment and Identification**

   o Conduct pre-program surveys and interviews to identify students with math anxiety.

   o Use diagnostic tests to assess their current math proficiency levels.

2. **Intervention Strategies**

   o Conduct workshops on overcoming math anxiety through mindfulness and relaxation techniques.

   o Implement peer mentoring and tutoring sessions to encourage collaborative learning.

   o Introduce engaging math games, puzzles, and real-world problem-solving activities.

   o Provide personalized support through small-group sessions.

3. **Skill-Building Activities**

   o Encourage the use of growth mindset techniques to change negative attitudes about math.

   o Incorporate storytelling, real-life applications, and hands-on activities to make math more relatable.

   o Teach stress management techniques such as deep breathing and visualization.

4. **Evaluation and Feedback**

   o Conduct post-program assessments to measure changes in students' attitudes and performance.

   o Gather feedback from students, teachers, and parents to refine and improve the program.

Program Matrix

Activities	Target Participants	Duration	Responsible Persons
Pre-assessment (survey, interview, diagnostic test)	Students	1 week	Teachers, Program Coordinators
Workshops on math anxiety relief techniques	Students	1-2 sessions per month	Math Coaches, Facilitators
Peer mentoring and tutoring sessions	Students	Ongoing	Trained Peer Tutors
Interactive math games and problem-solving activities	Students	Weekly	Math Teachers
Growth mindset and confidence-building activities	Students	Bi-weekly	counsellors, Educators
Parental involvement sessions	Parents	Once per quarter	Teachers, School Counsellors
Post-program assessment and evaluation	Students	1 week	Program Coordinators

Strategies

- **Personalized Learning Approaches:** Tailoring activities based on students' levels and needs.

- **Collaborative Learning:** Encouraging peer tutoring and group work.

- **Gamification:** Using math-related games and challenges to enhance engagement.

- **Mindfulness and Relaxation Techniques:** Teaching students strategies to reduce stress and anxiety.

- **Parental and Teacher Involvement:** Training stakeholders to provide consistent support at home and in the classroom.

Evaluation

- **Pre- and Post-Assessment:** Measure changes in students' math anxiety levels and performance.

- **Student Feedback:** Collect insights on which strategies were most effective.

- **Teacher and Parent Observations:** Assess students' attitudes and engagement in math-related activities.

- **Data Analysis:** Compare diagnostic test results before and after program implementation.

Expected Impact

- Reduced levels of math anxiety among participating students.

- Improved confidence and performance in math subjects.

- Positive changes in students' attitudes and motivation toward mathematics.

- Increased parental and teacher involvement in supporting students' mathematical growth.

- A model program that can be replicated in other schools to help more students overcome math anxiety.

Through the **Math Anxiety Relief Program (MARP),** students will develop a more positive and confident approach to mathematics, allowing them to excel academically and embrace the subject as an essential life skill.

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

A summary of findings and conclusions is presented in this chapter. Recommendations are formulated herein to effectively disseminate the study results and further research the relationship between the level of math anxiety of students and the level of teacher's learning support in alleviating anxiety.

Summary

This study used a descriptive-correlational research design to determine the level of math anxiety among students learning mathematics and to describe the teachers' learning support in alleviating anxiety among selected Grade 10 students. A researcher-made questionnaire was distributed to the 341 students who were chosen at random. To provide good analysis, interpretation, and implications of the data, weighted mean and Pearson's were used.

Based on the data collected, analyzed and interpreted, the following findings were summarized:

The overall mean of 3.00 shows that the level of math anxiety among students in learning mathematics were "Moderately High" in terms of psychological factors. The highest-rated concerns include feeling tense when solving math problems under time pressure with mean of 3.36 and experiencing a strong sense of failure after making a mistake with mean of 3.27. Other significant factors include frustration when unable to solve problems quickly with mean of **3.31** and stress during math exams with mean of **3.02**. The overall **section means of 3.00 i**ndicates that psychological anxiety plays a notable role in students' learning experiences in mathematics.

The overall mean of 3.14 indicates that level of math anxiety among students in Learning Mathematics in terms of cognitive factors were "Moderately High". The most significant concern is forgetting how to apply learned math concepts during tests with mean of 3.46, which falls under the **high** level. Other notable concerns include frequently believing they are not good at math with mean of 3.40 and experiencing mental blocks during exams with mean of 3.38. Additionally, students report difficulty focusing on math problems due to negative thoughts and struggling to process multiple steps in problem-solving. The overall **results** suggests that cognitive factors, such as self-doubt, test-related stress, and difficulty retaining concepts, play a significant role in students' math anxiety.

The overall mean of 2.80 indicates that students experience a **moderately high level of math anxiety** due to environmental factors. The highest-rated concern is feeling nervous when their math teacher asks them to solve a problem in front of the class with mean of 3.29, followed by feeling embarrassed when asking questions due to fear of judgment from classmates with mean of 3.04. Other significant factors include anxiety caused by parental comparisons of students' math performance with mean of 2.81 and teacher criticism of mistakes with mean of 2.80.

Additionally, students report struggling with the fast-paced nature of math lessons with mean of 2.67 and difficulty focusing due to classroom setup with mean of 2.65. Notably, the lowest-rated factor is the teacher's **teaching style** affecting students' understanding with mean of 2.53, which falls under the **low level.** Overall, the findings suggest that students' math anxiety is significantly influenced by their classroom environment, teacher interactions, peer comparisons, and parental expectations. Addressing these environmental

stressors through supportive teaching strategies and a more encouraging classroom atmosphere may help reduce students' anxiety in learning mathematics.

The overall mean of 2.76 indicates that students exhibit a **moderately high level of math anxiety** due to behavioral factors. The findings suggest that students' anxiety is significantly influenced by their study habits, procrastination, and avoidance of math-related activities. The highest-rated concern is feeling anxious about math due to irregular study habits with mean of 3.08, followed by anxiety when called on to explain math solutions in class with mean of 3.19. Additionally, students report that delaying studying for math exams until the last minute increases their anxiety with mean of 2.96, and failing to review lessons regularly further heightens stress with mean of 3.01. Other notable concerns include avoiding difficult math problems due to fear of making mistakes with mean of 2.68 and skipping assignments, which increases stress during class with mean of 2.68. Students also reported being afraid to ask for help due to fear of judgment with mean of 2.76 and skipping math classes when feeling unprepared with mean of 1.97. On the other hand, some behaviors, such as avoiding participation in class with mean of 2.57 and math-related activities outside of school with mean of 2.53, were rated lower, suggesting that not all students completely disengage from math.

Overall, the study highlights that students' behavioral tendencies, such as poor study habits, procrastination, and avoidance behaviors, contribute significantly to their math anxiety. Addressing these issues through structured study plans, confidence-building strategies, and a supportive learning environment could help reduce their anxiety levels.

The study examines the level of teacher's autonomy support in alleviating students' anxiety in learning mathematics. The findings indicate that students generally perceive high levels of autonomy support from their teachers, as reflected in the section mean score of **4.15 (SD = 0.63),** which falls under the **"High"** interpretation.

The highest-rated statement was **"The teacher answers our questions fully and carefully"** (M = **4.55**, SD = **0.99**), interpreted as **"Very High."** This suggests that students strongly appreciate teachers' thorough responses to their inquiries. Statements related to feeling understood, encouraged to ask questions, and confident in their mathematical abilities all received **"High"** ratings (Mean scores ranging from **4.06 to 4.47**).

However, the lowest-rated statements were **"We don't feel very good about the way the teacher talks to us"** (M = **2.55**, SD = **1.47**) and **"We feel able to share our feelings with the teacher"** (M = **3.86**, SD = **1.16**), indicating that some students struggle with emotional openness with their teachers.

Two items—**"We feel able to share our feelings with the teacher"** and **"The teacher listens to how we would like to do things"**—were rated as **"Moderately High"**, suggesting room for improvement in fostering student-teacher communication and accommodating students' preferences.

Overall, the results suggest that teachers provide a supportive learning environment that promotes student autonomy, but there are areas where interpersonal communication and emotional support could be enhanced.

Moreover, the results indicate that the **level of teacher's competence support in alleviating student anxiety in learning mathematics is high**, with a **section mean of 4.47 (SD = 0.72).** The highest-rated item was **"The teacher helps us to improve"** (M = 4.66, SD = 0.72), interpreted as **"Very High",** indicates that students strongly believe their teachers contribute to their growth and learning in mathematics.

Other aspects, such as making students feel capable in math, encouraging them to do well, and setting achievable goals, all received **"High"** ratings (Mean scores ranging from **4.30 to 4.49).** This indicates that students perceive their teachers as supportive in helping them develop confidence and competence in mathematics.

The results indicate that the **level of teacher's relatedness support in alleviating student anxiety in learning mathematics is very high,** with a **section mean of 4.58 (SD = 0.68).** Students strongly feel that their teachers provide emotional and social support, as shown by the **very high** ratings in areas such as **teacher support (M = 4.61, SD = 0.80), encouragement to collaborate (M = 4.61, SD = 0.78), respect for students (M = 4.71, SD = 0.68), and friendliness (M = 4.56, SD = 0.87).** The only item rated as **high** rather than very high was

the **teacher's interest in students (M = 4.42, SD = 0.90),** suggesting that while teachers generally build strong relationships with students, there is room for improvement in actively engaging with individual students' needs and concerns.

Additionally, professional development programs on **enhancing teacher-student relationships** can help educators refine their approach to building meaningful connections with students. By maintaining and enhancing these supportive strategies, teachers can continue to create a positive, anxiety-free learning environment where students feel valued and motivated to succeed.

Conclusions

Based on the summary of findings, the following conclusions were drawn:

The study revealed that students experience a **moderately high level of math anxiety**, influenced by psychological, cognitive, environmental, and behavioral factors. Psychological factors, such as fear of failure, time pressure, and exam-related stress, negatively impact students' confidence in mathematics. Cognitive factors, including self-doubt, difficulty retaining concepts, and negative thinking, further contribute to their anxiety, making it challenging to apply learned concepts during tests. Environmental factors, such as teacher interactions, peer comparisons, and parental expectations, also play a significant role in students' anxiety levels, particularly when they are asked to solve problems in front of the class or receive criticism. Additionally, behavioral factors like poor study habits, procrastination, and avoidance of math-related activities further exacerbate their anxiety, affecting their overall academic performance. Given these findings, it is crucial to implement targeted interventions to help students manage their anxiety and improve their learning experience in mathematics.

The findings indicates that **teachers provide a high level of autonomy support** in alleviating students' anxiety in learning mathematics, as reflected in the overall section mean of **4.15 (SD = 0.63),** which falls under the "High" category. Students generally feel that their teachers offer choices, understand their needs, encourage questions, and ensure comprehension of lessons. The highest-rated aspect was the **teachers' ability to answer questions thoroughly and carefully**, indicating strong instructional support.

However, certain areas received **moderately high** ratings, particularly **students' ability to share their feelings with teachers (M = 3.86, SD = 1.16)** and **teachers' willingness to listen to students' preferences on how to do things (M = 4.10, SD = 1.08).** The lowest-rated statement **(M = 2.55, SD = 1.47)** indicates that some students do not feel comfortable with the way their teachers communicate with them. These findings highlight the need for improved teacher-student interactions, particularly in terms of emotional support and fostering open dialogue.

The findings indicates that **teachers provide strong competence support, helping students build confidence in their mathematical abilities.** The high overall rating signifies that students feel encouraged, capable, and motivated to succeed in math due to their teachers' guidance. The very high rating for **teacher assistance in improvement** highlights that students acknowledge their teachers' role in their progress. However, while all aspects were rated positively, continuous efforts should be made to sustain and further improve competence support.

The study concludes that **strong teacher support, encouragement, and positive student-teacher relationships play a crucial role in alleviating student anxiety in mathematics.** The **very high** level of relatedness support indicates that students feel valued, respected, and comfortable in their learning environment. However, while teachers generally show interest in their students, there is still an opportunity to enhance **personalized engagement** to further address individual student needs.

Although the findings suggest a weak negative relationship between teacher support and student math anxiety, the lack of statistical significance implies that **other factors may influence students' anxiety levels more strongly.** While teacher support remains essential in creating a positive learning environment, it may not be the sole determining factor in alleviating math anxiety. **Personal factors (e.g., self-confidence, prior knowledge, learning strategies), classroom environment, and external influences (e.g., parental expectations, peer pressure)** could also play significant roles.

Recommendations

Based on the findings and conclusions of the study, several recommendations are proposed to help alleviate students' math anxiety and improve their learning experience.:

1. Teachers should implement supportive teaching strategies by fostering a positive and encouraging classroom environment, using engaging teaching methods, incorporating real-life applications of math, and providing constructive feedback rather than criticism.

2. Differentiated instruction and scaffolding techniques should be employed to accommodate varying levels of mathematical proficiency.

3. Establishing peer tutoring programs or study groups can further encourage peer support and collaboration, making math more interactive and less intimidating.

4. Teacher training and professional development should be enhanced to equip educators with techniques for creating a math-friendly classroom, providing emotional support, and using anxiety-reducing instructional approaches.

5. Providing counseling and psychological support is necessary, where schools should offer stress management programs and counseling services to help students cope with anxiety. School counselors can work with teachers to identify students who struggle with high math anxiety and provide individualized support.

6. Teachers should create a more open and approachable classroom environment where students feel comfortable sharing their thoughts and emotions.

7. Teachers should adopt a more **empathetic** and **student-centered** approach in their communication style to ensure students feel respected and valued.

8. Establish **mentorship or peer-support systems** where students can express concerns to teachers or classmates in a safe environment.

9. Teachers should be trained to recognize signs of anxiety and provide **positive reinforcement** to build student confidence.

10. Future studies may explore qualitative perspectives by conducting **interviews or focus group discussions** with students to gain deeper insights into their needs and experiences.

11. Teachers should be aware of students' **individual needs and preferred learning styles** to make lessons more engaging and effective.

12. Teachers should continue implementing **effective instructional strategies,** such as **guided practice, step-by-step problem-solving, and real-world applications of math concepts.**

13. Teachers can use **motivational strategies**, such as recognizing effort, promoting persistence, and sharing stories of overcoming challenges in math.

14. Allow students to **set their own math learning goals** while guiding them in achieving them.

15. Use interactive and engaging methods, such as **games, group activities, and real-life problem-solving scenarios**, to make learning more enjoyable.

By maintaining and enhancing these strategies, teachers can continue fostering **a positive learning environment that alleviates anxiety and strengthens student confidence in mathematics.**

And by integrating these recommendations, educators can take a **more holistic approach** to supporting students in overcoming math anxiety, ensuring both academic success and emotional well-being.

Dedication

This is lovingly and heartly dedicated to my family, to my supportive wife Albe Joy E. Salazar, to my brother and sisters, and to my friends.

Above all, to our Almighty God who is the source of everything and the center of all my endeavors.

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