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**Research Article** 

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# **Mathematics Anxiety and Academic Performance of Grade 10 Learners**

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**Abstract:** This study examined the relationship between mathematics anxiety and students' academic performance among 52 Grade 10 students at Dologon National High School Kiharong Annex, Kiharong Maramag Bukidnon during the 2024-2025 academic year. Using descriptive statistics and the Pearson Product Moment Correlation Coefficient, the research found that srudents demonstrated very satisfactory academic performance and moderate anxiety level. The Pearson correlation revealed a significant moderate negative correlation relationship (r = -.563, p = 0.00) between mathematics anxiety and academic performance, the findings suggest that when the level of mathematics anxiety increases the smaller the academic performance is (vice versa). The study highlights the importance of addressing anxiety through targeted interventions such as positive learning environment, collaboration which provide support system among students as this leads to long term impacts towards the higher education particularly in STEM fields.

Keywords: academic performance, mathematics anxiety, grade ten students.

# **INTRODUCTION**

Mathematics has been dubbed as the queen of all sciences as it plays various roles in many disciplines. Mathematics is known for its usefulness in our everyday life. Due to its importance researches has been made in providing 21<sup>st</sup> century learner solid grasp of mathematical concepts that paves the way towards the academic success. In Philippine Education, academic performance in mathematics calls high attention due to its inferior rank on international assessments. The PISA 2018, TIMSS 2019, and the PISA 2021 reveals that Philippine was among the most bottom performing country. When it comes to the National Achievement Test (NAT) as released by NRTRC and as cited by Tan and Cordova (2018), the Region MPS is just 48.92% which is significantly below 50% as required by the DepEd. On the other hand, Navarro and as cited by Tumana (2023), stated that the division of Bukidnon obtain the average of 44.34% MPS as specified on the DepEd Bukidnon division Education development plan 2017-2022.

Researchers strive to address this pressing concern; poor academic performance has been affected by several mitigating factor. According to Capinding (2022), students with poor academic performance has a problem with mathematics anxiety. With the same claim as cited by Tumana (2023) on the work of James, et al., Mathematic anxiety impedes students' improvement and development in terms of mathematical competence, which furtherly implies that when students are anxious about mathematics they thoroughly learn and cannot understand mathematics. Additionally, Timonera, et al., (2023), echoed this thought by emphasizing that mathematics anxiety does not only impacts academics but as well as psychological aspects by means of students' avoidance of the subject itself, having the fear of its abstract nature, students develop negative attitude leading to less motivated in dealing with the subject which are essential in learning mathematics.

In light of these characterization, this study was conducted at Dologon National High School Kiharong Annex among grade 10 students to determine the impact of Students mathematics anxiety towards their Academic Performance. The grade 10 students of the said school on their recent NAT results obtain the MPS of 33.23%, thus by looking into how math anxiety affects students' performance, we can better understand how feelings and mindset impact learning, leading for educators to design activities that will lessens anxiety and help students boost confidence and improve their performance towards mathematics.

#### Statement of the Problem

This study aimed to answer the following question:1. What is the level of students' academic performance?

- 2. What is the level of students' mathematics?
- 3. Is there a significant relationship between students' academic performance and mathematics anxiety?

### Hypothesis of the Study

1.  $H_0$ : There is no significant relationship between students' academic performance and students' mathematics anxiety.

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### LITERATURE REVIEW

The Available literature and studies highlight the impacts of mathematics anxiety on academic performance of students.

In several years passed, Filipino students have been tagged as one of the weakest performing individual when it comes to mathematics. In the Program for International Students Assessment (PISA, 2018) it reveals that Filipino students obtained 353 points as an average which is significantly below the OECD average points which is 489, this leads to the countries rank of 77<sup>th</sup> out of 79 participating countries. This inferiority in rank just supports the claim of poor performance of students in their academe.

This claim has also been supported by the Trends in International Mathematics and Science Study (TIMSS, 2019) which claims that the performance of Filipino students are relatively poor doe to the little mastery of the concept. The result reveals that only 19% if the Filipino students reached the low benchmark level which implies that only few individuals have some basic mathematical knowledge, only 6% reached the intermediate level meaning, that they can now apply basic mathematical knowledge in simple situations, and lastly only 1 % reached advance benchmark level which implies that students in this level students can now apply their understanding towards new problems. Amont the mentioned assessment the shares the same conclusion "Filipino students when it comes to mathematics, poorly performed. Having said on this pressing concern, there is a great need to investigate what factors affecting students' performance.

According to Segumpan and Tan (2018), mathematics anxiety is one of the factors that leads students to poorly perform, they mentioned that this anxiety creates problems in processing previously learned and new information, which implies that when students are anxious, their minds are pre occupied with fear that may leads to poor concentration which not only will affect how well they do in math but also makes hard for them to learn new information and recall what they have learned. Math anxiety as defined by National Numeracy (2023) is a feeling of tension or apprehension that interferes the ability to numbers manipulate and the solving of mathematical problems in both academic and ordinary life situations. This further implies that

students have the hard time to think clearly and work mathematical task at ease.

Moreover, Tumana (2023) cited the study of Khatoon and Mahmood that claiming that mathematics anxiety is one of the major reasons that the students avoid math, leasing to make those anxious students to feel bored, fearful in mathematics. Mutawah (2015) echoed this statement and added that anxiety affects persons perseverance and goal setting to which often clouded by prior anxious feelings and experiences.

Additionally on the study of Morada (2015), it shows that there is a significant relationship between numerical math anxiety and students' academic performances. It shows an inverse relationship for it has found that when students have higher anxiety level the poorer or the smaller their academics performance are.

The reviewed studies provide consistent evidence that anxiety greatly impacts students' academic performance. The findings support the rationale for investigating the impact of anxiety on the academic performance of regular Grade Ten students of Dologon National High School Kiharong Annex

# METHODOLOGY

### **Research Design**

This study employs a descriptive correlational research design to examine the relationship between mathematics anxiety and students' academic performance. By investigating these variables, this study aims to understand how anxiety affects students' performance in mathematics.

### **Research Locale and Participants**

The study was conducted in Dologon National High School Kiharong Annex, Kiharong Maramag Bukidnon. The participants were Grade Ten Students under regular class who are enrolled in the school year 2024-2025. The Sampling method used is total enumaration which includes all the Grade Ten (10) Students.

### Instrumentation

The primary data sources for assessing academic performance were the mathematics grades of the grade ten students from the third grading period. This data was analyzed in accordance with the guidelines outlined in DepEd Order No. 8, series of 2015, as detailed below.

**Table 1:** (Descriptors, Grading Scale and Remarks)

Descriptor	<b>Grading Scale</b>	Remarks
Outstanding	90 - 100	Passed
Very Satisfactory	85 - 89	Passed
Satisfactory	80 - 84	Passed
Fairly Satisfactory	75 – 79	Passed
Did not meet expectation	Below 75	Failed

The students' anxiety level was measured using the Mathematics Anxiety Rating Scale (MARS) developed by Ikegulu and as cited by Guita and Tan (2018). It has 40- item with items answered on a five- point scale, from strongly agree to strongly dis-agree. Its Cronbach alpha of 0.87 as it has been piloted in the grade 11 student of Dologon National High School Kiharong Annex. Below is the table that outlines on measuring students Anxiety level.

<b>Table 2:</b> (	Scale.	Range.	<b>Oualitative</b>	description.	and Interpretation)
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Scale	Range	Qualitative Description	Interpretation
5	4.20 - 5.00	Strongly Agree	Very Least Anxious (VLA)
4	3.40 - 4.19	Agree	Least Anxious (LA)
3	2.60 - 3.39	Undecided	Moderately Anxious (MA)
2	1.80 - 2.59	Disagree	Highly Anxious (HA)
1	1.00 - 1.79	Strongly disagree	Very Highly Anxious (VHA)

#### **Data Gathering Procedure**

This study involves Two (2) Phases. In the First phase, Phase 1, all the necessary documents are acquired which consist approval letters, consent from the parents of the participants, as well as participants consent (Grade 10 students), printing and preparation of the instrument used to ensure the readability and comprehendability of the material. In the next phase, Phase 2: materials are administered the survey questionnaire that the students had answered. In the same phase the grades of the students in the third grading are being correlate to examine if their anxiety in mathematics affects their math academe performance.

### **RESULTS AND DISCUSSION**

Descriptive statistics were calculated for all 52 participating students to check their level of academic performance in mathematics. In table 1 (outlined above) it shows the descriptors, grading scale and remarks used in analyzing the students' scores.

In Table 3: (outlined below) it showcases the level of students' academic performance.

RANGE	F	%	<b>QUALITATIVE INTERPRETATION</b>
90-100	13	25.00	Outstanding
85-89	19	36.54	Very Satisfactory
80-84	13	25.00	Satisfactory
75-79	7	13.46	Fairly Satisfactory
Below 75	0	0	Did Not Meet Expectation
MPS	85.	15	Very satisfactory

**Table 3:** (Students level of Academic Performance)

As illustrated in the table, the Students of Dologon National High school obtained the Mean score of 85.15%, Categorizing them as "Very satisfactory" there were students (25%) had an outstanding level of academic performance, meaning out of 52 total participants 13 of them got the grade of 90 to 100. 36.54% or 19 students attain the very satisfactory level, 25% or 13 had the level of satisfactory and lastly there are 13.46% or 7 students that attain the level of fairly satisfactory, and none of the participants obtained below 75.

The students' level of anxiety is outlined by the table given below, consisting the indicators, mean and its corresponding qualitative interpretation.

I able 4: anxiety instrument (indicators, mean, and qualitative interpretation)         INDICATORS					
INDICATORS Mathematics is a great shallongs for ma	2 57				
I corring and understanding math can be fun	3.37				
Learning and understanding matri can be fun	3.33				
I do my main nonework alone.	2.19				
It is difficult for the to understand main instructions	2.44				
Thearn main by solving problems.	3.44				
It takes many while to solve math problems	2.29				
It takes like a write to solve main problems	2.26	MA			
I generally crain a lot of information before main test	3.30	MA			
I enjoy mathematics.	3.34	MA			
I feel a lot of pressures in taking math courses	3.34	MA			
Mathematics is an exciting course.	3.32	MA			
1 am not good in solving math problems.	3.32	MA			
I enjoy showing others how to solve problems.	3.28	MA			
It is a joy to transform word problems into math expression	3.28	MA			
Doing workbook exercises help improve my math scores	3.28	MA			
Taking math test is frightening experience for me.	3.23	MA			
I am nervous about mathematics.	3.23	MA			
I always do well on mathematics examination	3.23	MA			
I feel confident in my ability to solve problems.	3.17	MA			
My mind seems to go blank during math test.	3.17	MA			
I make low score on my math test.	3.17	MA			
I like answering math questions in class	3.17	MA			
Most of my courses are math related.	3.15	MA			
It is difficult for me to grasp math concepts	3.13	MA			
I depend on my tutors for help in math	3.11	MA			
I make low scores on my assignments.	3.09	MA			
I like seeing my steps I used to arrive at my solutions.	3.07	MA			
Mathematics is one of my worst subjects	3.03	MA			
I avoid mathematics course.	3.01	MA			
I am fond of the mathematics logic	3.01	MA			
I feel lot of stress in taking math test	3.01	MA			
I blame mysid for my poor performance in mathematics	2.96	MA			
I have special dislike for mathematics	2.92	MA			
I am afraid to submit my math test or assignments.	2.9	MA			
My peers seem to understand me better than our teacher	2.86	MA			
Mathematics is one of my favorite subjects.	2.79	MA			
I do not want my math test and assignments to be evaluated	2.76	MA			
I volunteer myself to solve math problems on the board	2.71	MA			
Mathematics comes easy for me.	2.63	MA			
Mathematics is a boring subject	2.59	HA			
Overall mean	3.11	MA			

Among the 40 items of the mathematics anxiety rating scale, students are characterized to be moderately anxious by having an overall mean of (3.11). this mean score was subdivided in these categories: students are least anxious on (6) items, moderately anxious on (34) items and highly anxious on (1) item.

The 3 items with the highest mean score were as follows: "Mathematics is a great challenge for me"

(3.57), "Learning and understanding math can be fun" (3.55), and "I do my math homework alone (3.53), this implies that the students did not feel anxious in math because they viewed mathematics that it can be learned and understand through while enjoying it. Additionally, students work with their homework signifies that the students have a clear confidence that they can deal mathematical task. Lastly, they were least anxious because they did not feel that math is a great challenge for them. Hence students can handle mathematics on their own. on the other hand, the (3) items with the lowest mean score were as follows: "Mathematics is a boring subject" (2.59), "mathematics comes easy for me" (2.63) and, I volunteer myself to solve problems on the board (2.71), this signifies that students are more anxious as they view math as a boring subject, and it does not comes easy to them, most especially they are more anxious on solving problems on the board. This is align woth the study of Zhang, *et al.*, (2019), which found that those students that are more anxious in solving math problems on the board have a great fear on the said subject leading them to obtain lower grades of the said subject.

In the table below, it shows the relationship of mathematics anxiety and academic performance of the students

		Academic Performance	<b>Mathematics Anxiety</b>
Academic Performance	Pearson Correlation	1	563**
	Sig. (2-tailed)		.000
	Ν	52	52
Mathematics Anxiety	Pearson Correlation	563**	1
	Sig. (2-tailed)	.000	
	Ν	52	52

Cable 5:	(correlation	of mathema	tics anxiety	and students'	academic performance)	
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\*\* correlation significant at the 0.01 level (2- tailed)

This correlation results reveals that the Mathematics Anxiety r = -.563, (p < 0.01)

Was moderately negative correlation implying that when there is an increase level of mathematics anxiety, the level of academic performance of students decreases. This findings align with the previous research showing an inverse relationship between academic performance and math anxiety. However, in this study the overall mean score provided by the students suggests to be moderately anxious towards math. The non-significant p-value of .000 at the p < 0.01 level means the null hypothesis cannot be rejected, furtherly emphasizing that there is a moderate inverse relationship between mathematics anxiety and the academic performance of the students. This claim has been supported by Morada (2015) and solidify by buckley, et al., (2015) in the 2 different study, result reveals that there is a significant relationship between anxiety and mathematics performance. result reveals that there is an inverse relationship between these 2 variables, both studies emphasized that when the higher the math anxiety is the poorer or the smaller the students' performance, on the other hand, he mentioned that when the lower the anxiety level in mathematics is, the higher their

Thus, the P – value is .000 which is not significant at p < 0.01, this implies that it fails to reject the null hypothesis.

# CONCLUSION RECOMMENDATIONS

#### AND

The following conclusion were reach in light of this study's findings: Grade 10 students of

Dologon National High School Kiharong Annex have a very satisfactory Academic Performance level. When it comes to their level of anxiety in mathematics it has been found out that they are moderately anxious. When it comes to their relationship, it has been found out that they are moderately negative correlated, which implies that their anxiety impacts their performance in mathematics.

This study then leads to the following recommendation: educators must design a learning environment that fosters a support system, friendly and must have a proactive teaching - learning process that will address and lessen students' anxiety towards the subject. To the direct participants, students, they must always be open to any constructive feedback that their mentors are trying to give to them, be open minded to look into the positive side when things seem not as to be their expected. Lastly further studies and adaptation of effective strategies are encouraged to be implemented to help the students in their educational endeavors.

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