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MATHEMATICS ANXIETY: A STUDY ON SECONDARY STUDENTS OF KOLASIB

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ABSTRACT

This study aims to assess the level of mathematics anxiety among secondary school students in Kolasib town. It also focuses on studying mathematics anxiety with reference to the type of management of the schools they are currently attending and the type of school management under which they completed Class VIII (elementary stage). The study was carried out through a descriptive survey method, and for collection of data, the Mathematics Anxiety Scale developed by the investigator was used. Stratified Random Sampling was employed to collect a sample of 98 secondary school students studying in Government and Private secondary schools in Kolasib. It was found that the largest proportion of students experience an average level of mathematics anxiety. A significant difference in mathematics anxiety was found between students in Government and Private schools whereas no significant difference was found in mathematics anxiety based on the type of school (Government or Private) attended at the Class VIII level (Elementary level of education).

KEYWORDS: *Mathematics Anxiety, Secondary Students, Type Of School Management.*

INTRODUCTION

Mathematics is a foundational subject with significant educational implications and is necessary not only for academic achievement but also for daily living and many professional pathways. Mathematics is the means of sharpening the individual's thinking, shaping their reasoning capacity, and developing their personality, hence making a significant contribution to the general and fundamental education of the people of the world. (Asiedu-Addo and Yidana, 2000).

Mathematical anxiety is defined as a state of discomfort created when students are required to perform mathematical tasks (Cemen,1987). The fundamental features of this discomfort state are dislike, concern, and dread, with particular behavioral expressions such as tension, irritation, anguish, helplessness, and mental disorganization while dealing with mathematical activities (Richardson & Suinn,1972). Math anxiety is a common condition that affects many students, which usually arises from unfavourable encounters with mathematics and can impede educational achievements when not treated.

Rationale

Mathematics anxiety may emerge as a consequence of students' previous unpleasant experiences learning mathematics in the classroom or at home (Rossnan, 2006). Thus, schools should play a vital role in minimizing mathematics anxiety among students. Lending assistance and establishing a pleasant mathematics learning environment may lessen mathematics anxiety among students (Shields, 2006). Addressing mathematics anxiety is important for improving student performance and instilling a good attitude toward the subject. Educators should be knowledgeable about it and take the necessary actions to help students overcome their anxiety. This paper can create awareness among students, parents and teachers. Assist the educators and policymakers in establishing and implementing more effective support systems for children with mathematics anxiety and enhancing mathematics education.

Review of Related Literature

Khatoon & Mahmood (2010) examined the relationship of mathematics anxiety with gender, school types and mathematics achievement of the secondary school students According to the results of the analysis, nearly half of the secondary school students have a moderate level of anxiety, and females display more anxiety toward math than males. A high level of math anxiety is observed

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in students of Government and Government-aided schools, and a low level of math anxiety is observed in students of AMU and Missionary schools. There is a significant negative correlation (-0.48) between math anxiety and math achievement.

Zakaria (2012) in his study of mathematics anxiety and achievement among secondary school students found that there is mathematics anxiety among secondary school students. The t-test showed that the mean difference between mathematics anxiety and gender is not significant, and the ANOVA test showed that there were significant differences in achievement based on the level of mathematics anxiety. Thus, math anxiety is one factor that affects student achievement.

Awasthi, Imam & Singh (2015) conducted a study on the "Relationship between Mathematics Anxiety among Secondary School Students with School Type and Parental Education" and drew a sample of 500 secondary school students. The finding reveals that students studying in government schools are more anxious than those studying in private schools. There was a significant difference found in anxiety levels between students of government schools and those of private schools.

Mandal & Saha (2019) conducted a study on "Mathematics Anxiety and Prevention Strategies: An attempt to improve Mathematics Performance of Secondary School Students in West Bengal" and randomly selected government and private schools from Kolkata and South 24 Parganas district in West Bengal. Results revealed that there are significant differences in mathematics anxiety and performance in mathematics by gender and type of schools, but there is no significant difference between habitats in mathematics anxiety and performance in mathematics.

Kiso (2024) studied the Mathematics Anxiety level of secondary school students with respect to gender, type of management and class level. The study was conducted on a sample of 380 secondary school students. The results of the study revealed that there was no significant difference in the level of Mathematics anxiety between males and females, private and government, and class 9 and class 10 students. It also revealed that the majority of the secondary school students had an average level of Mathematics anxiety.

OBJECTIVES OF THE STUDY

1) To find the level of mathematics anxiety among secondary students in Kolasib.
2) To compare the mathematics anxiety of secondary students in Kolasib with respect to the type of management of the schools they are currently attending.
3) To compare the mathematics anxiety of secondary students in Kolasib based on the type of school management under which they completed Class VIII (elementary stage).

HYPOTHESES OF THE STUDY

1) There is a significant difference in the mathematics anxiety of secondary students in Kolasib with respect to the type of management of the schools they are currently attending.
2) There is a significant difference in the mathematics anxiety of secondary students in Kolasib based on the type of school management under which they completed Class VIII (elementary level of education).

METHODOLOGY

The present research was descriptive in nature, in which a quantitative approach was employed.

Population

The population of the present study comprised all secondary school students in Kolasib town.

Sample

The sample consists of 98 secondary school students studying in Kolasib. Stratified Random Sampling was employed by the investigator, where Government and Private secondary schools were the main strata and samples were randomly collected from there.

Table 1
Profile of secondary school students in Kolasib

Groups		No. of secondary school students	
Type of management of schools currently attended	Government	57	98
	Private	41	
Type of management of schools under which Class VIII (elementary stage) was completed	Government	37	98
	Private	61	

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Table 1 shows that out of the 98 secondary students selected as sample, 57 students are enrolled in Government schools whereas 41 are enrolled in Private schools. Also, out of these 98 students, 37 completed class VIII from Government schools whereas 61 completed from Private schools.

Tool

For this study, the Mathematics Anxiety Scale developed by the investigator was used for collecting data. This is a standardised tool to measure the mathematics anxiety of secondary school students. The scale is divided into three major dimensions: Cognitive dimension, Emotional dimension and Behavioural dimension of Mathematics anxiety. A total of 38 items are distributed across these dimensions. The scale is a five-point scale, which includes *Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree*.

Statistical techniques used

Various measures of central tendency, standard deviation, which is a measure of variability and z-scores were employed to understand the distribution of scores and to classify students into different categories based on the nature of their scores.

Inferential statistics like the t-test were applied to determine the significance of differences in mean scores between different groups.

Delimitation

Due to limitations in time and cost, the present study was delimited to Class X students studying in Government and Private secondary schools within Kolasib town.

Data analysis and interpretation

The data collected were analyzed and interpreted, in accordance with the objectives.

Objective No.1: To find the level of mathematics anxiety among secondary students in Kolasib.

In order to find out the level of mathematics anxiety among secondary school students of Kolasib, the Mathematics Anxiety Scale developed by the researcher was used. After calculating the mean and standard deviation, respondents were classified into different levels of mathematics anxiety based on their z-scores. The different levels of anxiety are shown in Table 2. Figure 1 presents a visual representation of the data.

Table 2
Level of mathematics anxiety among secondary school students of Mizoram

Sl. No.	Range of z-score	Grade	Levels of mathematics anxiety	No. of students in each anxiety level	Percentage of students in each anxiety level (%)
1	(+1.51 and above)	A	High anxiety	17	17
2	(+0.51 to 1.50)	B	Above average anxiety	25	26
3	(-0.50 to +0.50)	C	Average anxiety	29	30
4	(-1.50 to -0.51)	D	Below average anxiety	24	24
5	(-1.51 and below)	E	Low anxiety	3	3
			Total	98	100

Table 2 shows the division of students into five levels of mathematics anxiety, which was based on the norms given in the Mathematics Anxiety Scale. 17 students (17%) fall in grade A at the level of 'High anxiety', indicating significantly high levels of mathematics anxiety. The table also shows that 25 students (26%) exhibit above-average anxiety and are placed in grade B. The largest group, comprising 29 (30%) respondents, falls within the average anxiety range at grade C. 24 students (24%) are classified as having below-average anxiety, and 3 students (3%) have low levels of mathematics anxiety, placed in grades D & E, respectively.

Objective No.2: To compare the mathematics anxiety of secondary students in Kolasib with respect to the type of management of the schools they are currently attending.

In order to find out the mathematics anxiety of secondary students in Kolasib with respect to the type of management of the schools they are currently attending, the hypothesis which stated that 'There is a significant difference in the mathematics anxiety of secondary students in Kolasib with respect to the type of management of the schools they are currently attending', was converted

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into a null hypothesis which stated that, 'There is no significant difference in the mathematics anxiety of secondary students in Kolasib with respect to the type of management of the schools they are currently attending'.

To test the null hypothesis, a t-test was conducted, and a comparison was made between secondary students in government and privately managed schools. The Mean and the Standard Deviation were also calculated, and a t-test was used to test the Mean difference. The details are given in the following table.

Table 3
Comparison of the mathematics anxiety of secondary students enrolled in government and private schools

Type of management of the schools currently attended	No. Of Students	Mean	Standard Deviation	SED	t-value	df	Significance level
Government	57	127	24	5.92	2.03	96	Significant at 0.05
Private	41	115	32				

Table 5 compares mathematics anxiety between students in Government schools and Private schools in Kolasib.
The calculated t-value was 2.03 with its degrees of freedom 96, which is greater than the critical value at the required levels of significance. Therefore, there is a significant difference in the mathematics anxiety of secondary students in Kolasib with respect to the type of management of the schools they are currently attending.

Objective No.3: To compare the mathematics anxiety of secondary students in Kolasib based on the type of school management under which they completed Class VIII (elementary stage).

To evaluate the mathematics anxiety experienced by secondary students in Kolasib, based on the type of school management they had during Class VIII (elementary stage), the original hypothesis—that 'There is a significant difference in the mathematics anxiety of secondary students in Kolasib with respect to the type of management of the schools under which they completed Class VIII (elementary stage)'—was reformulated into a null hypothesis stating that 'There is no significant difference in the mathematics anxiety of secondary students in Kolasib concerning the type of management of the schools under which they completed Class VIII (elementary stage).' To test this null hypothesis, a t-test was performed and a comparison made between secondary students in government and privately managed schools. Additionally, the Mean and Standard Deviation were calculated, and a t-test was applied to assess the Mean difference. Details are provided in the following table.

Table 4
Comparison of mathematics anxiety of secondary students based on the type of school management under which they completed Class VIII (elementary stage).

Type of management of schools currently attended	No. Of Students	Mean	Standard Deviation	SED	t-value	df	Significance level
Government	37	124	24	5.51	0.54	96	Not significant
Private	61	121	30				

Table 4 compares the mathematics anxiety of secondary students based on Government and Private schools under which they completed Class VIII (elementary stage).

The calculated t-value was 0.54 with degrees of freedom 96, and the standard error of difference (SED) was 5.51. Since the t-value is less than the critical value at the 0.05 level of significance, the difference is not statistically significant. Therefore, it can be concluded that there is no significant difference in the mathematics anxiety of secondary students in Kolasib with respect to the type of school management under which they completed Class VIII.

FINDINGS

1. Analysis of mathematics anxiety levels reveals that the highest percentage (30%) of students fall in the average range, while 26% exhibit above-average anxiety. Notably, 17% of students experience high mathematics anxiety. In contrast, 24% show below-average anxiety, and only 3% fall in the low anxiety category.
2. A significant difference in mathematics anxiety was found between students in Government and Private schools (t = 2.03, df = 96).

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3. No significant difference was found in mathematics anxiety based on the type of school (Government or Private) attended at the Class VIII level (t = 0.54, df = 96).

CONCLUSION

The analysis of mathematics anxiety among secondary students in Kolasib revealed that a considerable number of students experienced average to high levels of mathematics anxiety, with 17% of students showing high anxiety and 26% showing above-average levels. A significant difference was observed based on the type of school management currently attended, indicating that the school environment plays a role in shaping students' anxiety. However, no significant difference was found concerning the type of school management under which students completed their elementary education, suggesting that earlier schooling has less influence on current mathematics anxiety compared to their present school setting.

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