

A Study on Mathematics Anxiety among Secondary Level Students in Relation to their Academic Achievement

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Abstract:- The aim of the research work is to find the relationship between mathematics anxiety and academic achievement of students studying at secondary level. The total number of sample included in this research work was 120 secondary level students. The sample was purposively selected from the students studying in Govt. High School, Badanuagan, Kuliana block (60 students) and Sripadganj Govt. High School, Baripada block (60 students) of Mayurbhanj district, Odisha. A self-developed questionnaire was used for collection of data. The method opted for the research work was descriptive survey method. The outcomes of the investigation, that there is a significant relationship between mathematics anxiety and academic achievement of secondary level students. In addition to this, high mathematics anxiety enhances the high academic achievement of secondary school students. Further, recommendations were given on the basis of obtained findings of the study.

Keywords:- Mathematics Anxiety, Secondary Level Students, Academic Achievement.

I. INTRODUCTION

Mathematics is the systematic and organized branch of science which deals with logic, shape, quantity, measurements, calculation, interpretation, reasoning and logical thinking. Its correlation with other subjects like science, medicine, geography, history, finance, architecture, astrology, engineering, physical education and hygiene can be easily seen for which it is placed in the school curriculum as a compulsory subject up to secondary level. The knowledge of mathematics is essential for development intelligence, reasoning, critical thinking and logical reasoning of students studying in the secondary level of their schooling. Anxiety is a state of feeling or emotion that develops curiosity, nervousness and fearfulness among learners. Mathematics anxiety is a psychological barrier that students face when they are performing a mathematical task. It is an emotional feeling of anxiety that learners have the ability to understand and perform different mathematics activities like quizzes, games and solving problems in the teaching learning process. Mathematics anxiety and students attitude towards the leaning of mathematics continue to attract

the attention of researches because of their association with students learning and achievement in mathematics.

II. LITERATURE REVIEW

A study carried out by Miller (1981) concluded that mathematics anxiety is directly related to perceptions of one's own mathematical skill in relation to skills in other subject areas. Salwani (2001) obtained that the high level of mathematics anxiety led to decline of student's achievement with the negative correlation i.e. $r = -0.254$ and p-value less than 0.05. A study by Kumar & Karimi (2010) on mathematics anxiety, mathematics performance and overall academic performance in high school students revealed that there is a significant gender difference in mathematics anxiety with respect to their academic performance. Bhowmik & Banerjee (2015) indicated there is a significant negative correlation between anxiety towards mathematics and achievement in mathematics. Further, a study on mathematics anxiety and its relationship with the achievement of secondary students in Malaysia showed that there is no significant difference between the levels of mathematics anxiety of female students compared to the male students (Puteh & Khalin, 2016). A study on mathematics anxiety of 10th class students with relation to their academic achievement in Sirsa district of Haryana, India obtained that high mathematics anxiety enhances the high academic achievement (Prakash, et al., 2018).

III. RESEARCH PROBLEM

Mathematics anxiety has become more popular in the last decades as it has been an area of attraction to scholars, researchers, teachers and students. One's mathematics anxiety is highly correlated to one's own self perceptions of performance in the subject (mathematics), one's role models, one's professors or teachers (supportive, highly qualified and highly experienced) in the subject (mathematics), and one's aspirations for their future career. In view of the above, the researcher concluded that it is necessary to carry out a research work on the entitled topic. Hence, the researcher has chosen this topic to conduct a descriptive survey study. It is expected that the outcomes of the research work would be utilized by

scholars, teachers, students, researchers, teacher educators, educationist and other teaching professionals in future.

IV. OBJECTIVES OF THE RESEARCH

The objectives of the research work are; 1) To find out the relationship between mathematics anxiety and academic achievement of secondary level students, 2) To find out the relationship between high and low academically achieved secondary level students on mathematics anxiety.

V. HYPOTHESES OF THE RESEARCH

The hypotheses of the research work are; 1) There is a significant relationship between mathematics anxiety and academic achievement of secondary level students, 2) There is a significant relationship between high and low academically achieved secondary level students on mathematics anxiety.

VI. DELIMITATION

The population of the study delimited to secondary school students only. The study delimited to 120 students as sample. The present study is confined to the secondary school students of **Govt. High School, Badanuagan** (60 students) and **Sripadganj Govt. High School, Baripada** (60 students) of **Kuliana** and **Baripada** block of **Mayurbhanj** district, **Odisha** respectively. The study is delimited to the students of the age group of 13-16 years only. The present study is delimited to two

variables i.e. **mathematics anxiety** and **academic achievement**.

VII. METHODOLOGY

The method adopted for the research work is descriptive survey method. In this research work, the population constituted out of secondary school students in **Govt. High School, Badanuagan, Kuliana** and **Sripadganj Govt. High School, Baripada** block of **Mayurbhanj** district, **Odisha**. For the collection of sample for this study **purposive sampling** technique is used. For the present study a total number of **120** students selected as sample by aforesaid sampling technique.

VIII. TOOLS AND TECHNIQUES

Tools and techniques are key components of research work as they play significant role in collection, analysis and interpretation of data. The investigator developed one questionnaire for the secondary school students for collection of data. For the present investigation, the investigator took the help of standardized tool like **Mathematics Anxiety Scale** by **Mahmood & Khatoon** and **Academic Achievement Scale**. Student selected in the sample are subjected to the mathematics anxiety test and academic achievement based on the marks obtained by the students of secondary schools in the previous classes.

Table-1 Relationship between mathematics anxiety and academic achievement among secondary school students

Variables	N	Degree of freedom	r-value	Level of Significance
Mathematics Anxiety	120	118	0.72	Significant at 0.01 level
Academic Achievement				

From Table-1 it is revealed that the co-efficient of correlation (**reliability**) between mathematics anxiety and academic achievement is calculated by **Karl Pearson's product-moment correlation method** (r-value) and it is found to be **0.72**. It is inferred that there is a high correlation between these two variables at 0.01 level of significance. It is statistically proved that mathematics anxiety and academic achievement of secondary school students are related, if mathematics anxiety is low, academic achievement will also be low, if mathematics anxiety is high, academic achievement will also be high. This indicates that there exists positive and high correlation between mathematics anxiety and academic achievement of students studying in secondary schools. The **face validity** of the tool is very high and **content validity** guaranteed that the items that are used in the tool have 100% compliance among secondary level learners.

IX. ANALYSIS AND INTERPRETATION

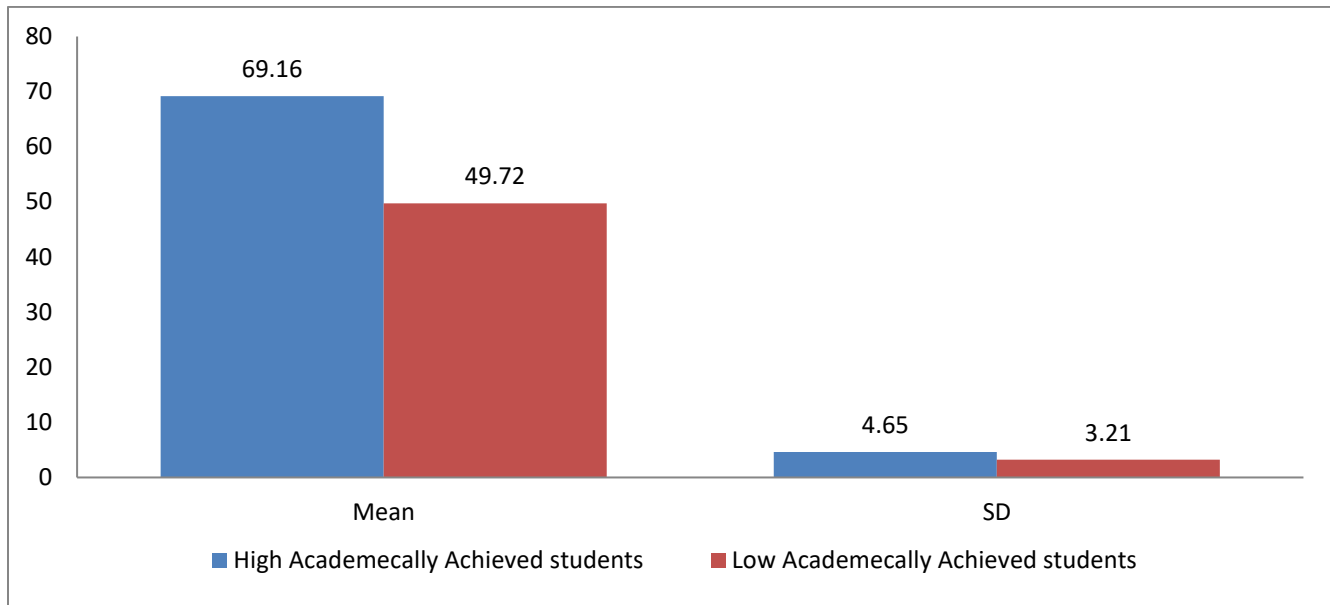
It is obtained from Table-2 that the mean scores of high and low academically achieved students are found to be **69.16** and **49.72** with SDs **4.65** and **3.21** respectively. The t-ratio comes out from the groups to be **26.63** which are significant at both levels i.e. 0.05 and 0.01. It indicates that there exists positive correlation between academic achievement & mathematics anxiety of students studying in secondary schools. Further, the average scores of high academically achieved students are higher than the low academically achieved students. Therefore, it is concluded that high mathematics anxiety strengthens the high academic achievement of secondary school students.

Table-2 Significant of difference between mean scores of high and low academically achieved secondary school students on mathematics anxiety

Variable	Groups	N	Mean	SD	SED	t-ratio	Level of Significance
Mathematics Anxiety	High Academically Achieved students	60	69.16	4.65	0.73	26.63	Significant at both level i.e. 0.05 and 0.01
	Low Academically Achieved students	60	49.72	3.21			

(Degree of freedom = 118, at 0.05 level = 1.98, at 0.01 level = 2.62)

The Mean and Standard Deviation (SD) of high and low academically achieved students with respect to mathematics anxiety are depicted in the above table is represented by the bar graph.



(Fig. 1, high and low academically achieved secondary school students on mathematics anxiety)

X. FINDINGS AND DISCUSSION OF THE RESULTS

Every study provides some meaningful information and knowledge to the related field and this study also has some systematic and meaningful information. The outcome of the research work revealed that there is a positive and high correlation between mathematics anxiety and academic achievement of students studying in secondary schools. The finding of the study suggested that high mathematics anxiety strengthens the high academic achievement of the student at secondary level. There are several educational implications of mathematics and academic achievement related to this study which is as: it helps the students in applying the knowledge of mathematics in real life situation to solve problems in the society efficiently and effectively, it also helps in developing confidence to foster student’s academic success. Mathematics anxiety is not only essential in development of concrete concept but also needed for abstract concept in mathematics at secondary as well as higher secondary level of schooling. Different enrichment programmes as well as remedial teaching should be provided to students having low mathematics anxiety to enhance their academic achievement at secondary level.

XI. RECOMMENDATIONS

In the research work the investigator selected 120 secondary school students; it’s recommended to conduct research on large samples. The sample was meted to Mayurbhanj district only; it’s suggested to collect the sample from remaining districts of Odisha. The investigator selected two variables i.e. academic achievement and mathematics anxiety; it is advised to select other variables in further research. It is entrusted to use ANOVA & ANCOVA technique for further research work. It is advised to find relationship of academic achievement with other subjects, which are taught in secondary schools.

XII. CONCLUSION

The outcomes of the research work shows that the mathematics anxiety is highly correlated with academic achievement of secondary school students. It indicates that students those who have high mathematics anxiety have better academic achievement as compare to students having low mathematics anxiety have low academic achievement. That means mathematics anxiety is very important to enhance academic success of students studying in secondary schools.

The academic achievement of the child depends upon his or her conceptual learning and understanding of mathematics in the teaching-learning process. It concludes that mathematics anxiety plays vital role in the academic achievement of secondary school students.

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