Research Article

Mathematical Anxiety and Achievement in Mathematics among Standard Ix Students.

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ABSTRACT

The value of mathematical education and the power of mathematics in the modern world arise from the cumulative nature of mathematics. The word "Mathematics" comes from the Greek word mathematical which means in ancient Greek what one learns and what one gets to know.

Keywords: Mathematical Anxiety, Mathematics Achievement, Standard IX Students, Academic Performance, Learning Difficulties

Need and significance of the study

Mathematical anxiety is a phenomenon that is often considered when examining student's problem in learning mathematics. Ashcraft,H.(2002) defined mathematical anxiety as a feeling of tension, apprehension or fear that interferes with maths performance. Anxiety is the state of being anxious, uneasiness with fear and desire regarding something doubtful. This anxiousness is expressed in many areas and individuals differ in their level of anxiety .Low level of anxiety is considered to be a correlate of high achievement. But high level of anxiety has a debilitating effect on one's performance. Mathematical anxiety has an indirect influence on achievement in mathematics. Mathematical anxiety when accompanied with tension prevents the students from learning mathematics. Mathematical anxiety is the most crucial topic in the area of mental health and when mental health is affected the students become unable to learn which in turn affects their achievement in mathematics. Furthermore the streamlining of courses is done at higher secondary level .Most of the students hesitate to choose the first group having mathematics as one of the subject due to their phobia and anxiety. Therefore an

attempt had been made to investigate the relationship of mathematical an.,xiety and achievement in mathematics among standard IX students .This might help the parents and teachers in reducing the mathematical anxiety. This will enable the students to enhance their perforn1ance in mathematics. Only few research works have been done in India pertaining to the relationship between mathematical anxiety and achievement in mathematics. Hembree (1990) conducted a thorough meta analyses of 151 studies concerning mathematical anxiety. The findings indicated that mathematical anxiety to be directly related to mathematics avoidance behavior among students. Ashcraft (2002) found out that highly anxious students studying mathematics avoided situations in which they have to use mathematical equations and formulae. Mathematical avoidance resulted in less competency exposure and mathematics practice,

leaving students more anxious and mathematically unprepared to achieve. From the review of related literature, studies regarding mathematical anxiety and achievement in mathematics were found to be scarce. As overcoming mathematical anxiety is significant in enhancing the performance in mathematics, the investigator conducted a study to assess the influence of mathematical anxiety on achievement in mathematics among IX standard students.

Objectives of the study

* To investigate the mathematical anxiety of IX standard students in terms of a) gender b) medium of instruction c) types of school management.
* To investigate the achievement in mathematics among IX students in terms of a) gender b) medium of instruction c) types of school management.
* To investigate the relationship between mathematical anxiety and achievement in mathematics among standard IX students.
* To investigate the relationship between mathematical anxiety and achievement in mathematics among standard IX students in terms of a) gender b) medium of instruction c) types of school management.

Methodology

The study investigated the influence of demographic variables like types of school management, gender and medium of instruction upon the dependent variable achievement in mathematics .Along with the demographic variables mathematical anxiety was considered as

the independent variable whose influence on the dependent variable, achievement in mathematics was also investigated. The investigator used random sampling technique for selecting samples from government, government aided and private schools. The sample size was 300. The samples belonged to the age group of 14. The samples were selected from 8 schools belonging to different types of school management like government, government aided and p1ivate schools in Chennai.

Tools Used

The mathematical anxiety scale was developed by the investigator. It had 34 statements out of which 12 were positive statements and remaining were negative statements. The reliability of the scale was established by the split half method using Pearson product moment correlation and the reliability of the full scale was determined using spearn1an -Brown prophecy formula and was found to be 0.88 .Intrinsic validity was established by taking the square root of reliability coefficient which was found to 0.94,which is highly reliable. The maximum possible score was I 70 and the minimum is l. For achievement in mathematics, Half yearly examination marks in Mathematics was collected from the schools.

Table-1:

Mean scores of mathematical anxiety and the factors

(Gender and Medium of instruction)

Variable	Sub sample	N	Mean	SD	CR	Level of significance
Gender	Boys	155	62.05	17.71	4.08	.01
	Girls	145	54.06	16.20		
Medium of instruction	Tamil	100	63.32	16.57	3.86	.01
	English	200	55.62	17.33		

Table-2:

Mean scores of achievement in mathematics and the factors

(Gender and Medium of instruction)

Variable	Sub sample	N	Mean	SD	CR	Level of significance
Gender	Boys	155	44.68	22.48	5.07	.01
	Girls	145	60.88	25.16		
Medium of instruction	Tamil	100	36.42	20.01	9.28	.01
	English	200	60.55	25.53		

Table-3:

Mean scores of mathematical anxiety and the factors

(Schools under Different Types of Management.)

Variable	N	Mean	SD	CR	Level of significance
Government	100	57.86	18.03	1.22	N.S
Aided	100	60.97	17.89		
Private	100	60.97	17.89	2.18	.05
Government	100	55.72	16.08		
Aided	100	57.86	18.03	0.88	N.S
Private	100	55.72	16.08		

Table-4:

Mean scores of achievement in mathematics and the factors

(Schools under Different Types of Management.)

Variable	N	Mean	SD	CR	Level of significance
Government	100	49.82	24.25	2.61	.01
Aided	100	41.21	22.37		
Private	100	41.21	22.37	8.05	.01
Government	100	66.49	21.99		
Aided	100	49.82	24.25	5.1	.01
Private	100	66.49	21.99		

Table -5:

Correlation scores of mathematical anxiety and achievement in Mathematics among IX standard students

Variable	N	r-value
Mathematical anxiety And achievement in mathematics	300	-0.55

Table-6:

Correlation scores of mathematical anxiety and achievement in Mathematics among IX standard students(Gender, medium of instruction and type of school management)

Variable	Sub Variable	N	r -value
Gender	Boys	155	-0.53
	Girls	145	-0.51
Medium of instruction	Tamil	100	-0.56
	English	200	-0.51

Type of school management	Government	100	-0.61
	Government aided	100	-0.59
	Private	100	-0.46

Analysis and Interpretation

Analysis was done to investigate the influence of various demographic factors such as gender, types of school management upon mathematical anxiety and achievement in mathematics. Relationship between mathematical anxiety and achievement in mathematics was also analyzed. There is significant difference between students in the mathematical anxiety in terms of their gender and medium of instruction. Boys had more mathematical anxiety than the girls. Tamil medium students had more mathematical anxiety than English medium students.

1. There is significant difference between students in the achievement in mathematics in tem1s of their gender and medium of instruction. Boys are lesser in their achievement in mathematics than the girls. Tamil medium students are lesser in their achievement in mathematics than English medium students.
2. There is significant difference between students in the mathematical anxiety in terms of their school management.
3. There exists no significant difference in mathematical anxiety between students studying in government and aided schools.

3.1. There exists no significant difference in mathematical anxiety between students studying in government and private schools.

3.2. There exists significant difference in mathematical anxiety between students studying in aided and private schools.

4. There exists significant difference m achievement among the students from different types of school management.

4.1. There exists significant difference between the students studying in government and aided schools in their achievement in mathematics

4.2. There exists significant difference between the students studying in government and private schools in their achievement in mathematics

4.3. There exists significant difference between the students studying in aided and private schools in their achievement in mathematics

5. There exists negative correlation between mathematical anxiety and achievement in mathematics
6. There exists negative c01Telation between mathematical anxiety and achievement in mathematics among students in terms of their gender, medium of instruction and type of school management.

Findings and Discussion

From the above analyses, it was fom1d that factors like gender, medium of instruction and types of school management influences both mathematical anxiety and achievement. Boys had more mathematical anxiety than the girls, hence their achievement in mathematics was poor. Tamil medium students had more mathematical anxiety than English medium students; hence their achievement in mathematics was poor. The students studying in private schools had lesser anxiety hence their achievement in mathematics was good when compared to aided and government schools. The study has proved the existence of negative correlation between mathematical anxiety and achievement in mathematics in terms of their gender, medium of instruction and type of school management. .If there is increase in mathematical anxiety the achievement in mathematics decreases among students.

Conclusion

From the findings of the study, the investigator realized the significance of the role of maths teacher in helping the students to overcome their mathematical anxiety. The teachers working in government, aided and private schools must be given training in helping their students to develop positive attitude towards mathematics and getting rid of their anxiety in studying mathematics. They must encourage them to work out mathematical problems, their doubts must be clraified, simple ways for solving problems and memorizing equations must be taught .They must help them in understanding the reasons behind misconceptions .They must help them in mastery learning which will enhance their achievement in mathematics.

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