

Mathematics Anxiety of Higher Secondary School Students in Relation to their Personal and School Related Factors

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ABSTRACT

The Aim of this study is to find out the Significant difference between Mathematics Anxiety of Higher Secondary School Students with respect to Gender, Board of Affiliation and Group of Study. The Sample of the study was selected by using Simple Random Sampling technique which includes 1050 Higher Secondary School Students in Chennai. Survey Method was used to collect data. Mathematics Anxiety was measured using the Mathematics Anxiety Scale. Differential Analysis was the Statistical Technique used. Study reveals that there exists a significant difference in the Mathematics Anxiety of the Higher Secondary School Students with respect to Gender and Board of Affiliation. It also shows that there is no significant difference in the Mathematics Anxiety of the Higher Secondary School Students with respect to Group of Study. Based on the results, it was recommended that, Mathematics Teachers should be trained periodically in order to have ideas of innovative approaches of Teaching Mathematics to avoid Anxiety.

Keywords: *Mathematics Anxiety, Innovative Approaches, Differential Analysis, Higher Secondary Students*

Mathematics is generally considered as the most difficult subject of all subjects. Students find lots of problems and difficulties in this subject in understanding the concepts, remembering the formulas, solving the problems and applying in practical situations. It is seen that students are doing good in all other subjects but fail to do so in Mathematics. If we consider a group of students, a few students are found to be high achievers on the one hand and a few are low achievers on the other, while a sizable number of students always appear as moderate achievers. The question arises why such a difference in achievement appears? Is this difference due to certain factors? Or is there any single factor or host of factors which account for all the differences in mathematics achievement? These questions often appear in the minds of the Educators, Educationists and the Psychologists. There can be many reasons behind this. One of the main reasons is fear and anxiety towards the subject. Students generally develop this anxiety in their school life and carry this anxiety throughout their life.

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Mathematics anxiety seemed to be a problem to many learners. Mathematics anxiety is defined as a discomfort state created when students are required to perform mathematical tasks (Cemen, 1987). Main characteristics of this discomfort state include dislike, worry, and fear, with specific behavioural manifestations such as tension, frustration, distress, helplessness, and mental disorganization when handling mathematical tasks (Richardson & Suinn, 1972). Moreover, feelings of anxiety can lead to panic, tension, helplessness, distress, shame, inability to cope, sweaty palms, nervous stomach, difficulty breathing, and loss of ability to concentrate (Posamentier & Stepelman, 1990).

Mathematics anxiety has affected all aspects of mathematics teaching and learning directly or indirectly. Mathematics anxiety could develop as a result of students' prior negative experiences learning mathematics in the classroom or at home (Rosnhan, 2006). Thus, teachers should play an important role in reducing the level of mathematics anxiety among their students. Parents and educators alike may be the source for learned response of children with mathematics anxiety. Lending support and providing positive mathematics learning environment may alleviate mathematical anxiety among learners (Shields, 2006).

Mathematics educators need to recognize the causes of mathematics anxiety. Educators can become more informed about the effects of mathematics anxiety by reading related literature and attending workshops and conferences on the topic. Students should be made to realize that myths such as mathematics aptitude are genetic and mathematics being a male domain is simply not true (Woodard, 2004). Changing attitudes about mathematics will require support from parents, teachers and society. If negative attitudes are not changed, students' performance, college and career choices will be limited (Shields, 2006). Mathematics anxiety is a reality for many students. Educators should be knowledgeable about its causes and provide supportive learning communities that assist students in overcoming it (Barnes, 2006).

Definition of Mathematics Anxiety

Mathematics Anxiety is defined as “a feeling of tension and anxiety that interferes with the manipulation of numbers and solving of mathematical problems in ordinary life and as well as in academic situations”.

Objectives Of the Study

The following objectives are formulated for the present study:

- To study whether the Mathematics Anxiety of the Higher Secondary School Students differ Significantly with respect to Gender.
- To study whether the Mathematics Anxiety of the Higher Secondary School Students differ Significantly with respect to Board of Affiliation.
- To study whether the Mathematics Anxiety of the Higher Secondary School Students differ Significantly with respect to Group of Study.

Hypotheses of the Study

The following hypotheses are formulated for the present study:

- There is no significant difference in the Mathematics Anxiety of the Higher Secondary School Students with respect to Gender.
- There is no significant difference in the Mathematics Anxiety of the Higher Secondary School Students with respect to Board of Affiliation.

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- There is no significant difference in the Mathematics Anxiety of the Higher Secondary School Students with respect to Group of Study.

METHODOLOGY

Survey Method was used in this Study. Student t-test was used to find out the difference between the Demographics Variables (Gender, Board of Affiliation and Group of Study) on the Research Variable (Mathematics Anxiety).

Population and Sample

A Sample of size 1050 was selected for the study. They were Students of XII Standard belonging to Twenty-Four Schools (Government, Aided and Private) of Chennai District.

Tools Used

Mathematics Anxiety Scale was developed and validated by the Investigator and the Supervisor.

Procedure of Data Collection

The data for the present study was collected from 1050 Students of XII Standard from Chennai District after taking due permissions from CEO-Chennai and respective Head Masters and Principals of the Schools. The data were collected personally by the investigator from all the 1050 Students. Proper instructions were given to the students to fill the questionnaire. Each student of XII Standard was provided with a personal data sheet, Mathematics Anxiety Questionnaire. Students were instructed to fill their particulars in the personal datasheet and to mark their correct response among the five distractors in each question.

Statistical Techniques

The Statistical Calculations and Analysis of the data were done using SPSS 22. The data were analysed using basic statistical measures of central tendency and relationship between variables.

- Descriptive Analysis (Mean and Standard Deviation)
- Differential Analysis (t-value)

Analysis And Interpretation of Data

Hypothesis 1

There is no significant difference between Boys and Girls in their Mathematics Anxiety

Table 1 Mathematics Anxiety with respect to Gender

Variable	Gender				t-value	p-value	Sign. Level
	Boys (N = 452)		Girls (N = 598)				
	Mean	S.D.	Mean	S.D.			
Mathematics Anxiety	113.67	32.49	109.51	29.98	2.15	0.03	P<0.05 Significant

Interpretation

The Calculated t-value is 2.15 which is greater than the table value 1.97 and the P-value is less than 0.05. Thus, the null hypothesis is rejected at 5% level of significance and it is concluded that there is a significant difference between Boys and Girls in their Mathematics Anxiety.

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Hypothesis 2

There is no significant difference between State Board and CBSE School Students in their Mathematics Anxiety

Table 2 Mathematics Anxiety with respect to Board of Affiliation

Variable	Board				t-value	p-value	Sign. Level
	State Board (N = 615)		CBSE (N = 435)				
	Mean	S.D.	Mean	S.D.			
Mathematics Anxiety	119.05	28.52	100.33	30.10	10.14	0.00	P<0.01 Significant

Interpretation

The Calculated t-value is 10.14 which is greater than the table value 1.97 and the P-value is less than 0.01. Thus, the null hypothesis is rejected at 1% level of significance and it is concluded that there is a significant difference between State Board and CBSE School Students in their Mathematics Anxiety.

Hypothesis 3

There is no significant difference between Maths and Business Maths Students in their Mathematics Anxiety

Table 3 Mathematics Anxiety with respect to Group of Study

Variable	Group				t-value	p-value	Sign. Level
	Maths (N = 575)		Business Maths (N = 475)				
	Mean	S.D.	Mean	S.D.			
Mathematics Anxiety	109.70	32.07	113.23	28.62	1.88	0.06	P>0.05 Not Significant

Interpretation

The Calculated t-value is 1.88 which is less than the table value 1.97 and the P-value is greater than 0.05. Thus, the null hypothesis is accepted at 5% level of significance and it is concluded that there is no significant difference between Maths Group and Business Maths Group Students in their Mathematics Anxiety.

Findings Of the Study

- There is a significant difference in the Mathematics Anxiety of the Higher Secondary School Students with respect to Gender.
- There is a significant difference in the Mathematics Anxiety of the Higher Secondary School Students with respect to Board of Affiliation.
- There is no significant difference in the Mathematics Anxiety of the Higher Secondary School Students with respect to Group of Study.

Recommendations

- Mathematics Curriculum should not be Overloaded.

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- Mathematics Teachers should be trained periodically in order to have ideas of innovative approaches of teaching mathematics to avoid anxiety among students.
- Parents should assist in following up their children on mathematics.
- Student's interest in mathematics should be stimulated by concerned stakeholders.
- There should be good Teacher-Student Relationship to enable teachers to understand their students' problems.

CONCLUSION

Study reveals that there exists a significant difference in the Mathematics Anxiety of the Higher Secondary School Students with respect to Gender and Board of Affiliation. It also shows that there is no significant difference in the Mathematics Anxiety of the Higher Secondary School Students with respect to Group of Study. Based on the results, it was recommended that, Mathematics Teachers should be trained periodically in order to have ideas of innovative approaches of Teaching Mathematics to avoid Anxiety.

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Conflict of Interest

The author(s) declared no conflict of interest.

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