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AN INVESTIGATION INTO MATHEMATICAL ANXIETY AMONG STUDENTS AT SENIOR SECONDARY LEVEL



Sunanda Kumari
M.Ed. Student

Co - Author Details :

Khushwinder Kaur

Associate Professor , Govt. College of Education , Jalandhar.



ABSTRACT

The present study is an attempt to investigate the Mathematical anxiety among students at senior secondary level. Descriptive survey method was used. The sample of the study comprised of 120 (60 Arts and 60 Science stream) students. The sample of the study was taken from the Government Senior Secondary students of Jalandhar district only. The age of subjects ranged from 16 to 18 years. Random cum purposive sampling technique was used. The objectives were: to investigate the level of Mathematical anxiety among the senior secondary school students; to study and compare Mathematical anxiety between boys and girls at senior secondary

level; to study and compare Mathematical anxiety between Arts and Science stream students at senior secondary level; and to provide suggestions to lessen Mathematical anxiety among senior secondary level students. The data were analyzed using descriptive analysis and inferential analysis to find out significant difference between students with different levels of Mathematical anxiety. The findings were as follows; it was found that there exists Mathematical anxiety among the senior secondary level students though in a lesser degree; no significant difference was found between boys and girls Mathematical anxiety at senior secondary level; no significant difference was found between Arts and Science stream students Mathematical anxiety at senior secondary level. Finally, suggestions to lessen Mathematical anxiety among students were provided.

KEYWORDS :Anxiety, Anxiety disorders, Mathematics, Mathematical anxiety, Causes of Mathematical anxiety, Symptoms of Mathematical anxiety.

INTRODUCTION

Mathematics is a good school of thinking. The thinking that you can learn in Mathematics is, for instance to handle abstractions. Mathematics is about numbers. Numbers are an abstraction. When we solve a practical problem, then from this practical problem we must first make an abstract problem. Mathematics should enable a child at least to handle abstractions and abstract structures. Mathematics reveals hidden patterns that help us understand the world around us.

Anxiety can be termed as feeling of unease, apprehension or worry. It may be associated with

physical symptoms such as rapid heartbeat, feeling faint and trembling. It can be normal reaction to stress or worry or it can sometimes be part of a bigger problem.

Maths anxiety is more than a dislike towards maths. Richardson and Suinn (1972) have defined Mathematics anxiety is a feeling of tension and anxiety that interfere with the manipulation of mathematical problems in varied situations in ordinary as well as academic life. Smith(1997) characterized math anxiety in a number of ways, including (1) uneasiness when asked to perform mathematically (2) avoidance of maths classes (3) feeling of physical illness, faintness, dread or panic (4) inability to perform on a test and (e) utilization of tutoring sessions that provide very little success.

It can also be explained as a sense of discomfort observed while working on mathematical problems (Hadfield & Trujillo, 1999; Ma, 2003). Richardson and Woolfolk (1980) discussed how certain features of math, such as its precision, logic and emphasis on problem solving, make it particularly anxiety provoking for some individuals. Several researchers also have proposed that maths anxiety contributes to observed sex differences in mathematics achievement and course enrollment patterns (Fennema, 1977; Fox, 1977). Tobias and Weissbord (1980) described maths anxiety as "the panic, helplessness, paralysis and mental disorganization that arises among some people when they are required to solve a mathematical problem. Spicer (2004) stated that mathematics anxiety is "an emotion that blocks a person's reasoning ability when confronted with a mathematical situation. Freedman (2003) defined maths anxiety as "an emotional reaction to mathematics based on a past unpleasant experience which harms future learning. Miller (1981) concluded that maths anxiety is directly related to perceptions of one's own mathematical skills in relation to skills in other subject areas.

NEED OF THE STUDY

Mathematics has played a predominant role in every sphere of life. Everyone makes use of knowledge of Mathematical formulas, laws and concepts all the time in real life situations, therefore understanding of Mathematical concepts is essential for everyone. Mathematics concepts are directly as well as indirectly related to real life situations. So, Mathematical knowledge has practical utility for everyone in their lives. It is easy to understand as compared to other subjects. Students don't have to cram more in Mathematics because of less theoretical concepts than formulas which are easy to learn. Also teachers can teach Mathematics by correlating concepts with real life situations, so that Mathematical anxiety is lessened in the students.

Maths anxiety is a feeling of intense frustration or helplessness about one's ability to do Maths. Maths anxiety is an emotional reaction to Mathematics. There are students who don't take interest in Mathematics and are afraid of it. This creates anxiety among the students. Due to wrong teaching methods with less practical work Maths anxiety increases. The teachers do not try to relate Mathematics with real life situations. Sometimes physical environment of schools also affects the concentration of students and they lack interest in Mathematics. Intellectual factors that affect Maths anxiety include learning styles, self doubt and dyslexia. The wrong learning styles create anxiety among the students. Nervousness at time of test, examination harm their academic achievement and later on their career.

OPERATIONAL DEFINITIONS OF THE TERMS USED

Mathematics: Mathematics is the Science of measurement, quantity and magnitude.

Anxiety: Anxiety is a complex combination of the feeling of fear, apprehension and worry often accompanied by physical sensations such as palpitations, chest pain and shortness of breath.

Mathematical anxiety: Mathematical anxiety is a feeling of tension and anxiety that interfere with the manipulation of mathematical problems in varied situations in ordinary as well as academic life.

Senior Secondary level: Senior secondary is a level in which the students of classes 10+1 and 10+2 are included.

OBJECTIVES OF THE STUDY

1. To investigate the level of Mathematical anxiety among the senior secondary school students.
2. To study and compare Mathematical anxiety between boys and girls at senior secondary level.
3. To study and compare Mathematical anxiety between Arts and Science stream students at senior secondary level.
4. To give suggestions to lessen Mathematical anxiety among senior secondary level students.

HYPOTHESES OF THE STUDY

1. There is a Mathematical anxiety among senior secondary schools students.
2. There is a significant difference in Mathematical anxiety between boys and girls at senior secondary level.
3. There is a significant difference in the Mathematical anxiety between Arts and Science stream students.

METHOD AND PROCEDURE

The descriptive survey method was used for this study. The sample of the study was selected from district Jalandhar. A sample of 120 students was taken from the schools. Schools were selected randomly followed by purposive sampling of students. Out of these 60 students were taken from Science stream and 60 students from Arts stream. Out of 60 Arts stream students 30 were girls and 30 were boys. Out of Science stream students 30 were girls and 30 were boys.

The standardized test named "Math Anxiety Scale (MAS)" by Sadia Mahmood and Dr. Tahira Khatoun (2011) was used as tool for this study.

After selecting the sample the test was administered to the senior secondary school students and data collected then scoring was done according to the instructions given in the manual.

ANALYSIS AND INTERPRETATION OF DATA

The following statistical techniques were employed in order to analyze the data.

1. Mean and standard deviations were worked out to describe the data.
2. t-test was applied to compare the Mathematical anxiety between students.

The analysis and interpretation of data and discussion of result in term of objectives of the study and the results have been interpreted in following sections:

(1) Investigation of Mathematical anxiety among senior secondary school students:

TABLE NO. 1

Number of students	Mean	Standard deviation
120	33.58	9.15

Table 1 clearly shows that mean score of Mathematical anxiety among senior secondary schools students is 33.58 and standard deviation is 9.15. According to the Mathematics Anxiety Scale (MAS) mean value of 32.45 had less anxiety and 45.51 had high anxiety. The present study showed the mean 33.58 which comes under the category of less anxiety. So the senior secondary school students showed anxiety but in a lesser degree.

(2) Comparison of Mathematical anxiety between boys and girls at senior secondary level.

TABLE NO. – 2

Gender	Number	Mean	S.D.	S. Ed	t-value	Level of Significance at 0.05 level
Boys	60	33.75	10	1.65	0.96	Non-Significant
Girls	60	32.17	7.98			

FIGURE : - 2

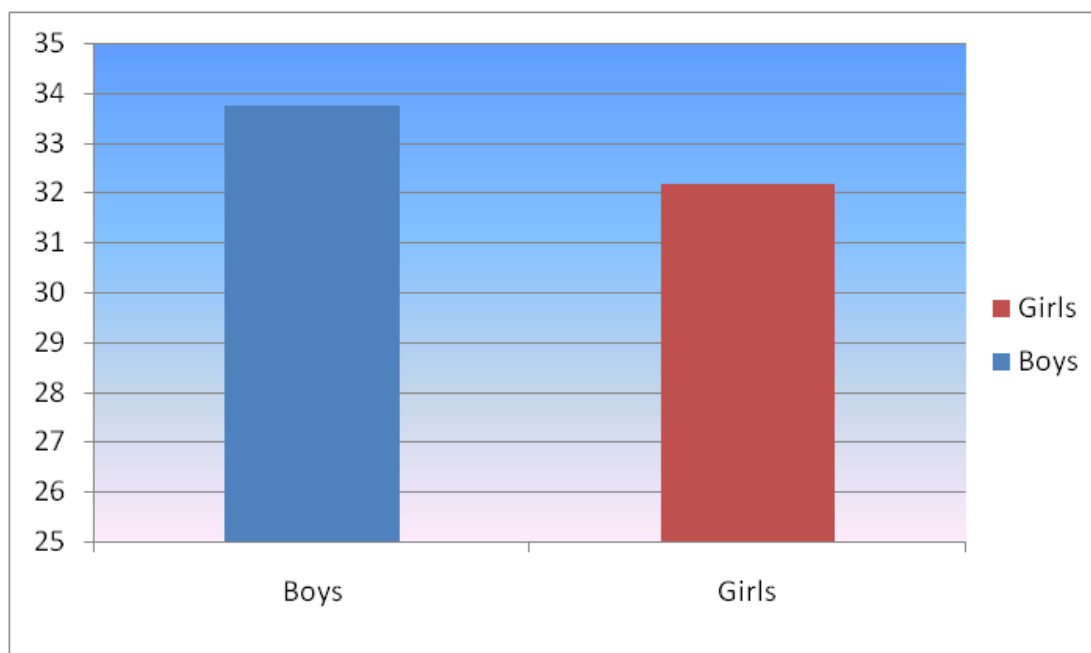


Table 2 clearly shows that the mean score of the Mathematical anxiety for boys at senior secondary level is 33.75 with S.D 10 and for girls mean score are 32.17 with S.D 7.98. The calculated t-value was 0.96 and checked at level 0.05 and found non- significant. Hence it was concluded that there is no significant difference in the mean score of Mathematical anxiety of boys and girls. Therefore, our second hypothesis that there is a significant difference in the Mathematical anxiety of boys and girls students stands rejected.

(3) Comparison of Mathematical anxiety between Arts and Science stream students at senior secondary level.

TABLE NO. – 3

Stream	Number	Mean	S.D.	S. Ed.	t-value	Level of Significance at 0.05 level
Arts	60	33.67	6.18	1.67	0.10	Non-Significant
Science	60	33.5	11.38			

FIGURE :- 3

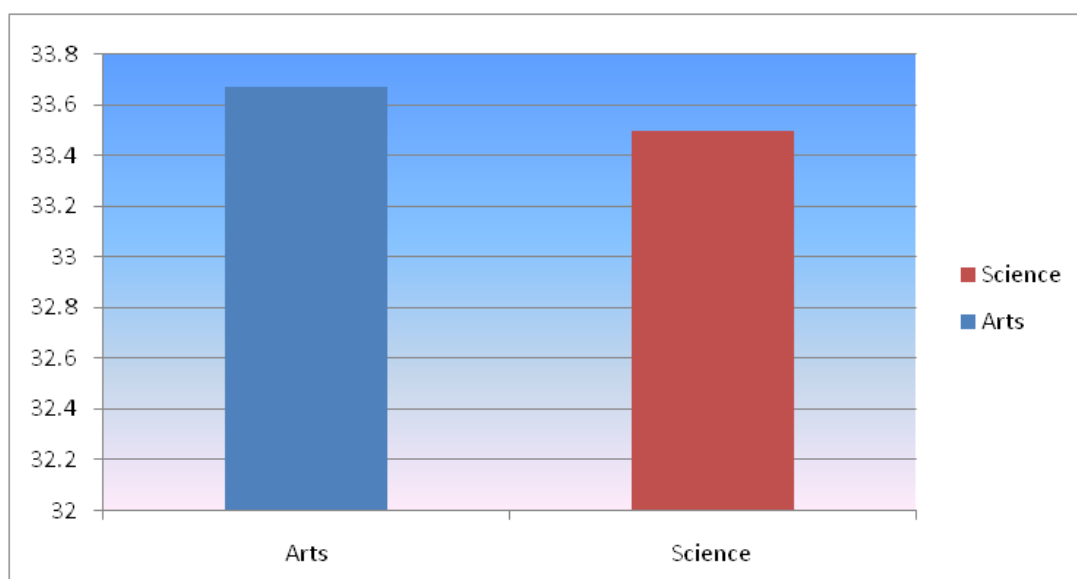


Table 3 clearly shows that mean score of Mathematical anxiety for Arts stream students is 33.67 with S.D 6.18 and for Science stream students is 33.5 with S.D 11.38. The calculated t-value is 0.10 and found non- significant. Hence, it was concluded that there is no significant difference in the mean score of Mathematical anxiety of Arts and Science stream students. Therefore, our third hypothesis that there is significant difference in the mean score of Mathematical anxiety of Arts and Science stream students stands rejected.

FINDINGS AND DISCUSSION

1.It was found that there exists Mathematical anxiety among the senior secondary school students. But the degree of anxiety found was less as per the Mathematical anxiety scale (MAS). The results were in accordance with studies (Wigifield & Meece,1988; Green & Allerton,1999; Jackson, 2008; Mahmood & Khatoon, 2011) which had also reported and found that there exists Mathematical anxiety among senior secondary school students.

2.No significant difference was found between boys and girls in their Mathematical anxiety at senior secondary level. The results were in accordance with (Wilder,2012 ; Keshavarzi & Ahmadi,2013) which had also reported and found that there is no significant difference between Mathematical anxiety of boys and girls at senior secondary level.

3.No significant difference was found between Arts and Science stream students Mathematical anxiety at senior secondary level. The investigator did not come across any study related with Mathematical anxiety in Arts and Science stream students at senior secondary level.

SUGGESTIONS TO LESSEN MATHEMATICAL ANXIETY

The fourth objective of the study was to provide suggestions to reduce Mathematical anxiety among students. The suggestions are as follows:

- 1.First of all, parents need to help the students to lessen their Mathematical anxiety. They can provide good home environment to students and create positive attitude towards Mathematics.
- 2.Practice of the Maths problems frequently can help in reducing Mathematical anxiety.
- 3.Parents and teachers need to be aware of the problems of the child.
- 4.Teachers should give extra time to students if it is needed.
- 5.Teachers should provide them real life experience of use of Maths in daily life.
- 6.Teachers should encourage the students in exploring, thinking, practicing and using knowledge, rather than listening to verbal descriptions of concepts.
- 7.Teachers should incorporate games and activities into maths lessons so that students can experience maths in hands-on fashion.
- 8.Parents should not hold and express negative attitude about maths and should have realistic expectations.
- 9.Parents should show how maths is used in positive ways, such as sports, hobbies, home repairs, and number games.
- 10.Students should practice maths problems daily.
- 11.Students should become acquainted with good study techniques.
- 12.Students should study according to their individual learning style.
- 13.Students should not rely solely on memory.

EDUCATIONAL IMPLICATIONS

Its educational implications are as follows:

- 1.Parents and teachers need to make joint efforts to reduce anxiety among students. These days' students suffer a lot of stress especially in difficult subjects such as Maths, Science and languages. Therefore, it is important to reduce their stress. This can be done by creating a positive attitude towards subjects and providing a congenial environment at home and school.
- 2.For reducing Mathematical anxiety curriculum should be less burdensome, more learner friendly and related to life.
- 3.Methods of teaching should be learner centred and interesting. Innovative use of teaching aids can be made. More teaching aids should be used to clear the concepts of Maths.

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