

“A STUDY OF MATHEMATIC ANXIETY OF 10TH CLASS STUDENTS IN RELATION TO THEIR ACADEMIC ACHIEVEMENT”

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ABSTRACT

Mathematics anxiety in students has become a concern for our Indian society. Evidence of students' poor attitude and high levels of anxiety toward mathematics is in abundant. In the midst of a technological era, declining mathematics scores in 'Scholastic Aptitude Test' as well as poor mathematic scores had been published in the third 'International Mathematics and Science Study'. The other notable consequences of mathematic anxiousness are the inability to do mathematics, the decline in mathematics achievement. Present study aim is to study of mathematic anxiety of 10th class students in relation to their academic achievement. For this study mathematics anxiety test was distributed to 220 students in which 110 boys and 110 girls were given mathematics anxiety test and instruction were given to them for completing the questionnaire and descriptive survey method was used. Results shows that that boys having high mathematic anxiety having mean value more than girls having high mathematics anxiety regarding academic achievement. Therefore it is concluded that boys having high mathematics anxiety have more academic achievement as compare to girls having high mathematics anxiety. It is concluded that boys having high mathematics anxiety have more academic achievement as compared to boys having low mathematics anxiety. It is also concluded that boys having low mathematics anxiety having mean value more than boys having low mathematics regarding academic achievement. There exists positive correlation between academic achievement and Mathematics anxiety of boys & girls of 10th class student, because the calculated (coefficient of correlation) is more than standard table value at both level of significance. Therefore, it is concluded that high mathematics anxiety enhances the high academic achievement.

Keywords: Mathematic , Anxiety, Academic Achievement , Private Schools .Low, High ,Boys, Girls

I.INTRODUCTION

Academic Achievement

The word is becoming more and more competitive Academic Achievement has become the key factor for personal progress. Parent's desire that their children climb the ladder of achievement to as high level as possible. This desire for a high level of achievement put lot of pressure on the students, teachers and in general education system itself. Achievement of students in our country is measured in terms of their performance in examination. There is not at all desirable permutation but here can't be any running away of this standard formula of achievement on the basis of achievement of school going boys/girls. He/she is bracketed either good/poor, intelligent/slow. Infact, it appears as if the whole system of education revolves round the academic achievement of student.

The importance of scholastic or academic achievement has raised several questions of education for education researcher. What different factors contribute towards academic achievement etc. The achievement of the child depends upon his conceptual learning and understanding in class. It further depends on numerous factors like child interest and motivation in the subject that they study, the devices and methods adopted by teacher in class family set-up and situational study habits of variable. It is pertinent to mention that economic, social and cultural factors make their contribution in academic achievement high or low for the students. The mental makeup, personality factors and surrounding do play an important role in shaping the performance of achievement of boys and girls. The variable may be highly anxious to achieve high performance but the factors examined above do have a direct or indirect effect on his performance at different stages of his education. Ability of variable to get experience and desire benefits from them is another factor reckon with. The experts in the field believe that intelligence can't be increased as it is inborn

II.MATHEMATICS ANXIETY

Mathematics anxiety often leads to avoidance of math by those who experience . Often students who are anxious bored, and fearful towards mathematics or who do not comprehend the importance of mathematics in professional and personal life are the one most likely to avoid the study of mathematics. It cannot be stressed more forcefully, the fact that maths is truly the gateway to engineering, scientific, and techno-logical fields. Mathematics anxiety in students has become a concern for our Indian society. Evidence of students' poor attitude and high levels of anxiety toward mathematics is in abundant. In the midst of a technological era, declining mathematics scores in 'Scholastic Aptitude Test' as well as poor maths scores had been published in the third 'International Mathematics and Science Study'. The other notable consequences of maths anxiousness are the inability to do maths, the decline in mathematics achievement. the avoidance of mathematics courses, the

limitation in selecting college majors and future careers and the negative feelings of guilt and shame (Betz, 1978; Burten, 1979; Donady & Tobias, 1977; Hendel, 1980; Richardson & Suinn, 1972). Furthermore, individuals with maths anxiety have shown to avoid environments and careers that require the utilization of maths skills (Ashcraft, 2002). Therefore, it can be inferred that maths anxiety greatly impacts maths education and students career choice. Hence, the professional and economic gains that will result from changing maths anxiety into maths confidence cannot be overstated. Not only that the psychological boost that comes with maths achievements is also regarded as important for students and others alike (National Research Council, 1989). Mathematics Anxiety Defined 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." It can also be explained as a sense of discomfort observed while working on mathematical problems (Hadfield & Trujillo, 1999; Ma, 2003) and is associated with fear and apprehension to specific maths related situations (D' Ailfy & Bergering, 1992). Smith (1997) characterized maths anxiety in a number of ways, including: (a) uneasiness when asked to perform mathematically (b) avoidance of maths classes (c) feelings of physical illness, faintness, dread or panic (d) inability to perform on a test and (e) utilization of tutoring sessions that provide very little success. Miller (1981) concluded that maths anxiety is directly related to perceptions of one's own mathematical skill in relation to skills in other subject areas.

STATEMENT OF THE PROBLEM:-

The topic of the present study is "A STUDY OF MATHEMATIC ANXIETY OF 10TH CLASS STUDENTS IN RELATION TO THEIR ACADEMIC ACHIEVEMENT".

OPERATIONAL DEFINITIONS USED IN THIS STUDY

Different words have their different connotations according to their places of references. Therefore, for the investigator, it was more essential to explain the words which were used repeatedly in her investigation. Some of the terms used in present study are as under:

1.Mathematic Anxiety:- 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."

2.Academic Achievement:- Good (1945) in his book "Dictionary of Education" has defined academic achievement as the knowledge attained or skills developed in the school subjects, usually designated by test scores or marks assigned by teachers'.

OBJECTIVES OF THE STUDY:-

The objectives of the present study are as under:-

- (i) To compare the academic achievement of boys and girls having high mathematic anxiety.
- (ii) To compare the academic achievement of boys and girls having low mathematic anxiety.
- (iii) To compare the academic achievement of boys having high and low mathematic anxiety.
- (iv) To compare the academic achievement of girls having high and low mathematic anxiety.
- (v) To study the relationship between academic achievement of mathematics anxiety of boys & girls of 10th class.

HYPOTHESES:-

The specific hypotheses are as under:-

- (i) There is no significant difference between the mean academic achievement of boys and girls having high mathematic anxiety.
- (ii) There is no significant difference between the mean academic achievement of boys and girls having low mathematic anxiety.
- (iii) There is no significant difference between the mean academic achievements of boys having high and low mathematic anxiety.
- (iv) There is no significant difference between the mean academic achievements of girls having high and low mathematic anxiety.
- (v) There is no significant difference between academic achievements & mathematics anxiety of boys and girls studying in 10th class.

DELIMITATIONS OF THE STUDY:-

The present study was delimited to the following:

1. The present study was delimited to two variables :
 - a) Student Mathematic anxiety
 - b) Academic Achievement
2. The study was confined to the students of three schools of Sirsa Distt.
3. The study was delimited to the students of the Class X students.
4. The study was delimited to the students of the age group of 13-16 years only.

METHODOLOGY

In this research descriptive survey method was used.

POPULATION

All the 10th class students studying in private secondary schools of Sirsa district constitute the population.

TOOLS USED:-

For the present investigation, the investigator used the following tools:-

1. MATHEMATIC ANXIETY SCALE

Dr. (Mrs.) Sadia Mahmood

Dr. (Mrs.) Tahira Khatoon

2. ACADEMIC ACHIEVEMENT

In this study descriptive survey method was used. Student selected in the sample was subjected to the mathematic anxiety test and achievement was based on the marks obtained by the students in 10th Class.

STATISTICAL ANALYSIS:-

In this research, Mean, S.D. & 't' Test was used

i. Mean : It is commonly taken as arithmetic average. It is computer by diving the sum of all the scores by the number of scores.

$$X = \frac{\sum x}{N}$$

M = Mean

\sum = Summation

N = Number

ii. Standard Deviation (SD) : It is used as a measure of the spread of scores in a distribution.

$$S.D. = \sqrt{\frac{\sum x^2}{N}}$$

iii. 't' test : - This test is applied to test the significance of the difference between two means. It comprises the computation of the ratio between two means. It comprises the computation of the ratio between experimental variance (observed difference between two sample means) and error variance (sampling error factor).

$$t = \frac{M_1 - M_2}{\sqrt{\frac{\sigma_1^2 - \sigma_2^2}{N_1 - N_2}}}$$

Where

M_1 = Mean of I Group

M_2 = Mean of II group

N_1 = Number of Cases of I Sample

N_2 = Number of cases of II Sample

III. ANALYSIS & INTERPRETATION OF DATA

Identification of 10th class students on the basis of mathematics Anxiety – For this study mathematics anxiety test was distributed to 220 students in which 110 boys and 110 girls were given mathematics anxiety test and instruction were given to them for completing the questionnaire. On the basis of this questionnaire the scoring was made & found the 25 boys and 25 girls having high mathematic anxiety and similarly 25 boys and 25 girls having low mathematic anxiety.

For this, the mathematics anxiety scale authored by Dr. (Mrs.) Sodiah Mahmood & Dr. (Mrs.) Tahira Khatoon was used. Now the academic achievement of identified high mathematics and low mathematic anxiety test was noted down:

25 boys

25 Girls

High mathematics anxiety

25 boys

25 Girls

Low Mathematics Anxiety

Academic achievement of 25 girls and 25 boys with high mathematic anxiety and low mathematic anxiety was studied and noted of 10th class students & further analysis & Interpretation was made.

Norm for interpreting the level of anxiety in mathematics.

Sr. No.	Row Score	Grade	Anxiety Level in mathematics
1	43-49	B	High Anxiety
2	25-30	C	Low Anxiety

Hypothesis No. 1 There is no significant difference between the academic achievement of boys and girls having high mathematic anxiety.

Table 1.1

Mean, S.D. & 't' value of academic achievement of 10th class students of Boys & Girls having high mathematic anxiety

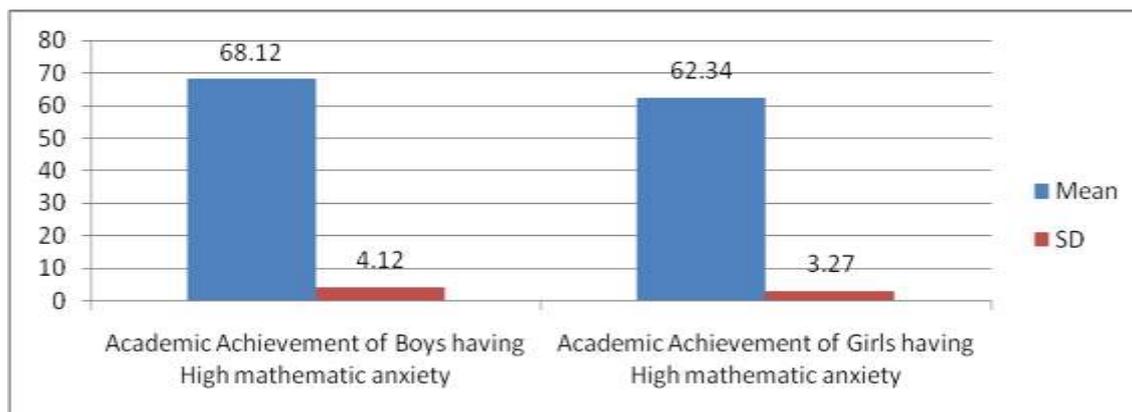
Sr. No.	Variable	N	M	S.D.	DF	't' Value	Level of Significance
1	Academic Achievement of Boys having High mathematic anxiety	25	68.12	4.12	48	5.50	Significant at both levels i.e. .05 & .01
2.	Academic Achievement of Girls having High mathematic anxiety	25	62.34	3.27			

df = 48, .05 = 2.01, .01 = 2.68

Interpretation : In this study the mean, S.D. of Academic achievement of boys & girls having high mathematics anxiety 68.12, 62.34 & 4.12, 3.27 respectively. The calculated 't' value is 5.50 which is more than standard table value at both levels of significance. It is analysed that hypothesis No. 1 is rejected. The mean value of Boys having high mathematics anxiety have more academic achievement as compare to girls having high mathematics anxiety.

It is finally concluded that the boys having high mathematics have more academic achievement as compare to girls having high mathematics anxiety.

Figure 1.1



Hypothesis No. 2 : There is no significant difference between the academic achievement of boys and girls having low mathematic anxiety.

Table 1.2

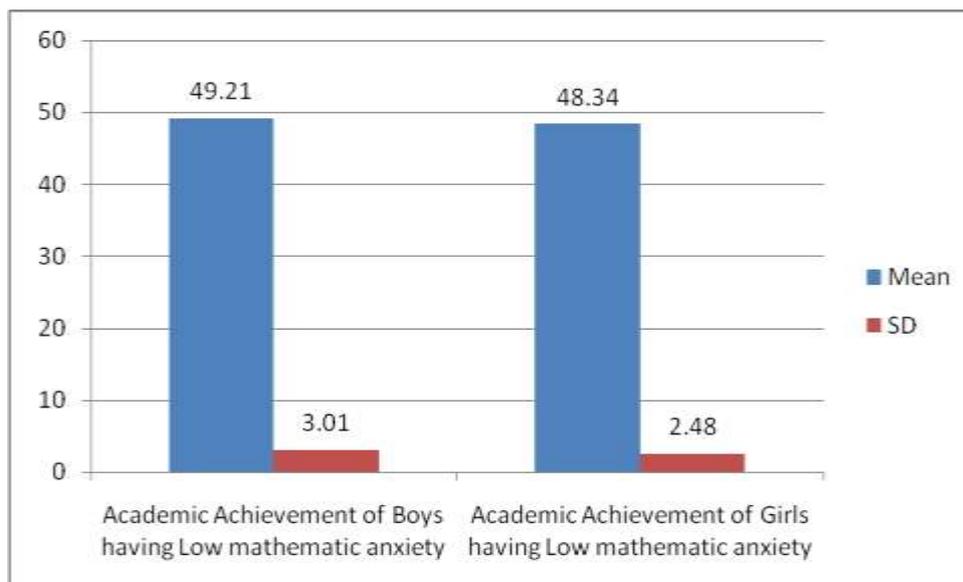
Mean, S.D. & 't' value of academic achievement of 10th class students of Boys & Girls having low mathematic anxiety.

Sr. No.	Variable	N	M	S.D.	DF	't' Value	Level of Significance
1	Academic Achievement of Boys having Low mathematic anxiety	25	48.34	2.48	48	1.11	Not Significant at both levels i.e. .05 & .01
2.	Academic Achievement of Girls having low mathematic anxiety	25	49.21	3.01			

df = 48, .05 = 2.01, .01 = 2.68

Interpretation : In this study the mean, S.D. of Academic achievement of boys & girls having low mathematics anxiety is 48.34, 49.21 & 2.48, 3.01 respectively. The calculated 't' value is which is less than standard table value at both level of significance. It is analysed that hypothesis No. 2 is accepted. The mean value of Boys having low mathematics anxiety with academic achievement as compare to girls having low mathematic anxiety have no any gap difference finally concluded that the boys having low mathematics anxiety with academic achievement as compare to girls having low mathematics anxiety having no significant difference.

Figure 1.2



Hypothesis No. 3 : There is no significant difference between the academic achievements of boys having low and high mathematic anxiety.

Table 1.3

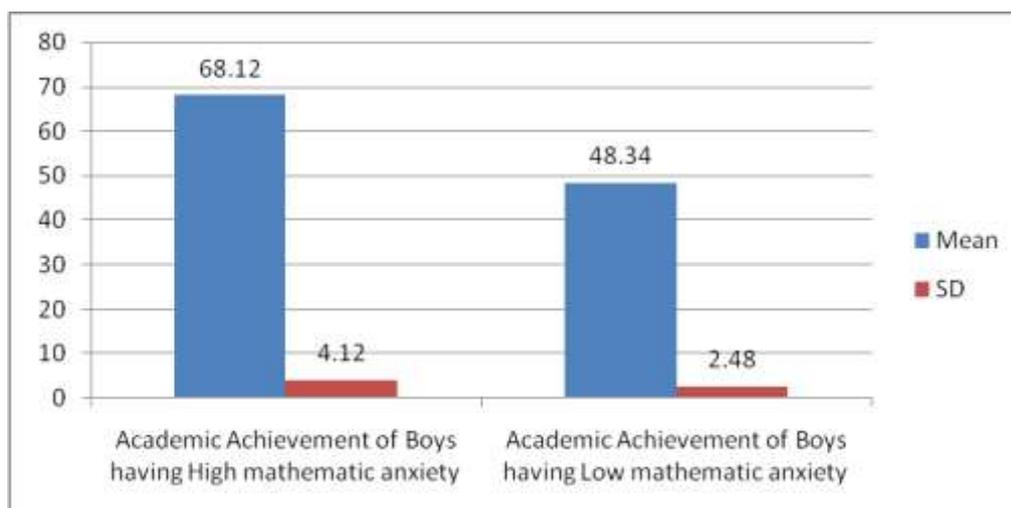
Mean, S.D. & 't' value of academic achievement of 10th class students of boys having low & high mathematics anxiety.

Sr. No.	Variable	N	M	S.D.	DF	't' Value	Level of Significance
1	Academic Achievement of Boys having high mathematic anxiety	25	68.12	4.12	48	20.58	Significant difference at both levels i.e. .05 & .01
2.	Academic Achievement of Boys having low mathematic anxiety	25	48.34	2.48			

$df = 48, .05 = 2.01, .01 = 2.68$

Interpretation : In this study the mean, S.D. of Academic achievement of boys with low & high mathematics anxiety is 68.12, 48.34 & 4.12, 2.48 respectively. The calculated 't' value is 20.58 which is more than standard table value at both level of significance. It is analysed that hypothesis No. 3 is rejected. The mean value of Boys having high mathematics anxiety have more academic achievement as compare its boys having low Mathematics anxiety. It is finally concluded that the boys having high mathematics have more academic achievement as compare to boys having low mathematics anxiety.

Figure 1.3



Hypothesis No. 4 : There is no significant difference between the academic achievements of girls having high and low mathematic anxiety.

Table 1.4

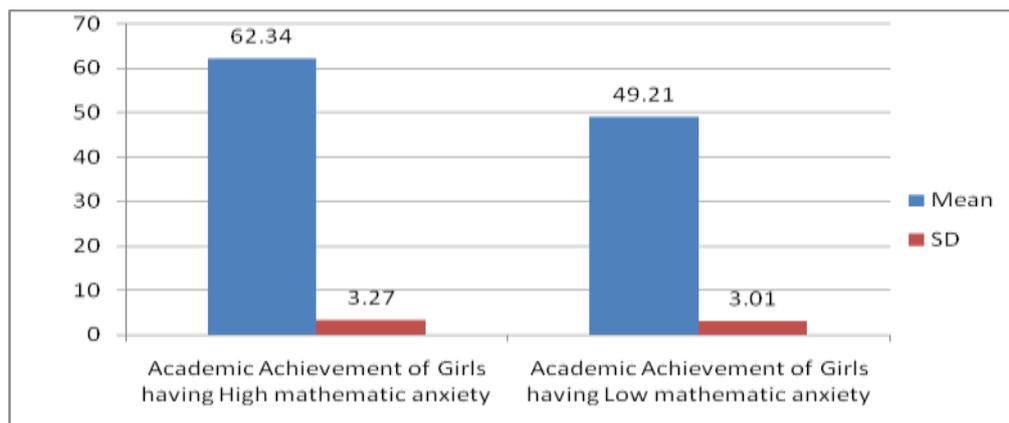
Mean, S.D. & 't' value of academic achievement of 10th class students of Girls having low & high mathematics anxiety.

Sr. No.	Variable	N	M	S.D.	DF	't' Value	Level of Significance
1	Academic Achievement of Girls having high mathematic anxiety	25	62.34	3.27	48	14.78	Significant at both levels i.e. .05 & .01
2.	Academic Achievement of Girls having low mathematic anxiety	25	49.21	3.01			

df = 48, .05 = 2.01, .01 = 2.68

Interpretation : In this study the mean, S.D. of Academic achievement of girls having low & high mathematics anxiety is 62.34, 49.21 & 3.27, 3.01 respectively. The calculated 't' value is 14.78 which is more than standard table value at both level of significance. It is analysed that hypothesis No. 4 is rejected. The mean value of Girls having high mathematics anxiety have more academic achievement as compare its girls having low Mathematics anxiety. It is finally concluded that the girls having high mathematics have more academic achievement as compare to girls having low mathematics anxiety.

Figure 1.4



Hypothesis No. 5 : There is no significant relationship if academic anxiety and Mathematics anxiety of boys and girls of 10th class.

Table 1.5

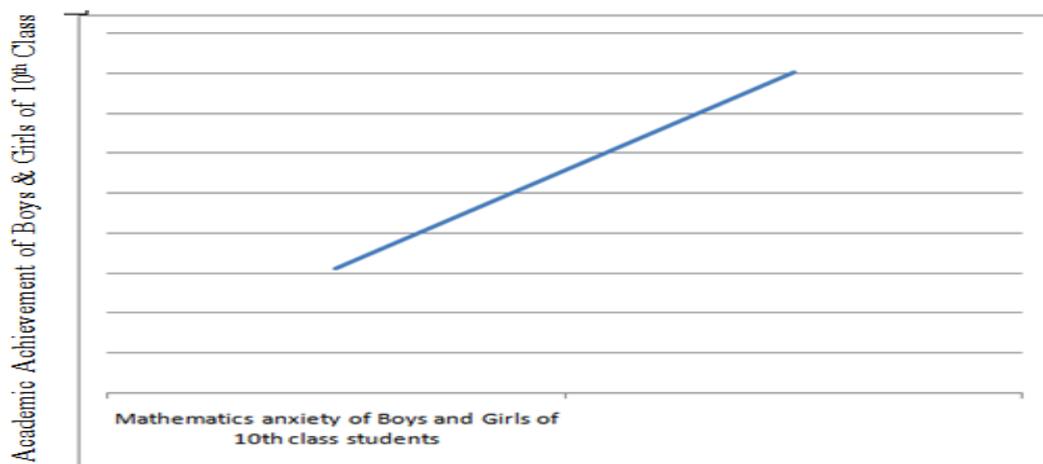
Mean, coefficient of correlation of Boys and Girls having academic achievement & Mathematics anxiety.

Sr. No.	Variable	N	M	DF	't' Value	Level of Significance
1	Academic Achievement of Boys & girls of 10 th Class	50	57.03	98	.072	Significant at both levels i.e. .05 & .01
2.	Mathematics anxiety of Boys and Girls of 10 th class students	50	52.12			

df = 98 , .05 = 2.01, 0.1 = 2.68

Interpretation : In this study, the academic achievement of boys & girls was found to be 57.03 and the mathematics anxiety was 52.12 & the coefficient of correlation between academic achievement & mathematics anxiety was calculated by product movement correlation method & it was found to be 0.72, which indicates that there exists positive correlation between academic achievement & mathematics anxiety of boys & girls studying in 10th class.

Figure 1.5



IV.MAJOR FINDINGS

- 1 In Hypothesis No. 1 There exists significant difference between boys and girls having high mathematics anxiety regarding academic achievement. The calculated 't' value is more than standard table value at both level of significance, therefore hypothesis 1 is rejected. It is concluded that boys having high mathematic anxiety having mean value more than girls having high mathematics anxiety regarding academic achievement. Therefore it is concluded that boys having high mathematics anxiety have more academic achievement as compare to girls having high mathematics anxiety.
- 2 In Hypothesis No. 2 There exists no significant difference between boys and girls having low mathematics anxiety regarding academic achievement. The calculated 't' value is less than standard table value at both

level of significance, therefore hypothesis 2 is accepted. It is concluded that academic achievement of boys and girls having low mathematic have no significance difference with boys having low and girls having low mathematics anxiety.. The mean value of academic achievement of boys having low mathematic anxiety is appropriate equal to girls having low mathematics anxiety.

- 3 In Hypothesis No. 3 There exists significant difference between boys having high and low mathematics anxiety regarding academic achievement. The calculated 't' value is more than standard table value at both level of significance, therefore hypothesis 3 is rejected. It is concluded that boys having, low mathematics anxiety having mean value more than boys having low mathematics regarding academic achievement. Therefore, it is concluded that boys having high mathematics anxiety have more academic achievement as compare to boys having low mathematics anxiety.
- 4 In Hypothesis No. 4 There exists significant difference between girls having high & low mathematics anxiety regarding academic achievement. The calculated 't' value is more than standard table value at both level of significance, therefore hypothesis 4 is rejected. It is concluded that academic achievement of girls having high mathematics anxiety have significance difference with girls having low mathematics anxiety. The mean value of academic achievement of girls having high mathematics anxiety is more than girls having low mathematic anxiety.
- 5 In Hypothesis No. 5 There exists positive correlation between academic achievement and Mathematics anxiety of the boys & girls of 10th class student, because the calculated (coefficient of correlation) is more than standard table value at both level of significance. Therefore, it is concluded that high mathematics anxiety enhances the high academic achievement.

V. EDUCATIONAL IMPLICATIONS

In this research the major finding state that the boys and girls with high mathematics anxiety have significant difference & boys have more academic achievement than girls with high mathematics anxiety. Similarly the boys and girls have significant difference in academic achievement with high & low mathematic anxiety. The boys & girls with low mathematic anxiety and boys and girls with high mathematics anxiety have more academic achievement with compare to low mathematics anxiety have no significant difference regarding academic achievement. It is the natural phenomena that if you are more have more anxiety, you will have more academic achievement & similar results are found in this research. Therefore boys & girls should be motivated to create more anxiety in mathematics so that their academic achievement may be improved.

VI. SUGGESTIONS FOR FURTHER RESEARCH

1. In this study the investigator selected 110 boys & 110 girls of 10th class, it is advised to take more bigger sample.
2. In this study, the sample was delimited Sirsa district. It is advised to explore the sample in another districts of Sirsa district.
3. In this the investigator selected two variable i.e. academic achievement of previous class student, mathematics anxiety it is advised to select other variables in further research.

4. In this the statistical techniques used are mean, S.D. & 't' test and correlation. It is advised to use ANOVA & ANCOVA for further study.

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