



Relationship between Mathematics Anxiety among Secondary School Students with School Type and Parental Education.

KEYWORDS

Mathematics Anxiety, School Type and Parental Education.

Devyani Awasthi

Assistant Professor, Department Of Education , J.N.P.G College , Lucknow (India)

Dr. Ali Imam

Associate Professor ,Department of Education, Integral University, Lucknow (India)

Gyan Pratap Singh

Research Scholar, Department of Education, Integral University, Lucknow (India)

ABSTRACT

The study proposes and confirms a set of independent variables (School Type and Parental Education) and its effect on dependent variable is mathematics anxiety. The sample size is limited to 500 secondary school students. The tool used in the Mathematics anxiety scale (MAS) and A Personal and Environmental Factors Assessment Questionnaire and the data was analyzed using computation of means and standard deviation, computation of standard error and use of t –test for measuring the significant of the difference between the means. Students studying in government schools are found to be more anxious than those studying in private schools. There was significant difference found in anxiety levels between students of government schools and that of private schools. There was significant difference found in anxiety levels of students having parents with different levels of education. In case of both father and mother, the children whose parents that are not educated or less education are more anxious than those who have both or one of mother and father having higher level of education.

Introduction :

The learning of mathematics is indispensable because of its wide ranging applications in our life. The present society requires the use of the skills such as estimating, problem solving, interpreting data, measuring, predicting and applying mathematics in everyday life situations. The National Policy on Education (NPE) 1986 has rightly defined mathematics as the vehicle to train a child to think, reason, analyze and articulate logically. Moreover, the National Curriculum Framework for School Education (NCFSE) 2000 has reiterated that the study of mathematics contributes to the development of precision, rational and analytical thinking, reasoning and positive attitude and aesthetic sense. In an increasingly technological society, mathematics is becoming an increasingly important discipline within our occupational and educational structures. Students often develop mathematical anxiety in schools as a result of learning from teachers who are themselves anxious about their mathematical abilities in certain areas. Typical examples of areas where mathematics teachers are often incompetent or semi-competent include fractions, logarithms algebra , geometry ,calculus, and topology In many countries, would-be math teachers are required only to obtain passing grades of 51% in mathematics exams, so that a math student who has failed to understand 49% of the math syllabus throughout his or her education can, and often does, become a math teacher. His or her fears and lack of understanding then pass naturally to his or her students Math anxiety has become so prevalent on college campus that many schools have designed special counseling programs to help math anxious students. Math anxiety is an emotional, rather than intellectual, problem. However, math anxiety interferes with a person's ability to learn math and therefore results in an intellectual problem.

Mathematics anxiety is a feeling of tension and anxiety that interfere with the "manipulation of mathematical problem" in varied situations in ordinary as well as academic life (Richardson & Suinn, 1972). 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

math related situation (D' Ailly & Bergering, 1992). It is found among elementary school students (Jackson & Lef-finwell, 1999 Steele & Arth, 1998); high school students (Hembree, 1990) and in college students (Tobias, 1990, Bitner et al 1994).

Most studies of math anxiety have been conducted with high school and college- age students Mathematics anxiety is prevalent among the college students population (Betz 1978). Lazarus (1974) believed that roots of mathematics anxiety are in the elementary and secondary grades.Norwood (1994) emphasized that math anxiety did not appear to have single cause, but was in fact, the result of many different factors such as truancy, poor coping skills, teacher attitude and emphasis on learning math through drill without understanding. Researchers have suggested that anxiety in mathematics in secondary schools is a function of may interrelated variables like student's abilities, attitude perceptions, socio economic values, parental education and occupation, family size, peer groups, size of the school, types of management, resources, salaries of the teachers and tuition fees and so forth. Many of these variables are home and families related and thus are difficult to change and also out of control of the educators.

Math anxiety is an intense emotional feeling of anxiety that people have about their ability to understand and do mathematics. People who suffer from math anxiety feel that they are incapable of doing activities and classes that involve math. Some math anxious people even have a fear of math; it's called math phobia. The incidence of math anxiety among college students has risen significantly over the last decade. Many students have even chosen their college major in the basis of how little math is required for the degree. Mathematics anxiety is a feeling of tension and anxiety that interfere with the "manipulation of mathematical problem "in varied situations in ordinary as well as academic life (Richardson & Suinn, 1972). 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 math related situation (D' Ailly & Bergering, 1992).

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Objectives:

- To study the influence of school types on math anxiety of students.
- To study the influence of parental education on math anxiety of student.

Hypotheses:

- There is no significant difference in the anxiety of the student of different school types.
- There is no significant difference in the anxiety of the student of different types of parental education.

Tools used:

The tools employed for collection of the data mentioned above included the following :

Mathematics anxiety scale (MAS).

This test was developed by Dr, (Mrs.) Sadia Mahmood , Department Of Education , Aligarh Muslim University, Aligarh and Dr. (Mrs.) Tahira Khatoon, Associate Professor, department of education ,Aligarh Muslim University , Aligarh .

A Personal and Environmental Factors Assessment Questionnaire

This questionnaire was prepared by the investigator.

Methodology:

The research was conducted in Lucknow (U.P) .The researcher selected the sample mainly from capital of the city ie. Lucknow, U.P India. Simple random sampling methodology was used. Only secondary schools were selected for the study. The sample was limited to only from 9th grade secondary schools student .The sample size was limited to 500 students. The study was conducted taking different variable which contribute towards mathematics anxiety but only gender, parental education mathematics achievement and school type were selected. In the study 250 male and 250 female students were administered and taking into consideration the school type variable the sample was divided into 250 for private and 250 for government school. The parental education was divided into mother and father education. It was further divided into no, low , medium and high education.

Following statistical techniques were used for analyzing the data:

- Computation of means and standard deviation.
- Computation of standard error.
- Use of t –test for measuring the significant of the difference between the means.

Results and Analysis :

1: Relationship between School type and mathematics anxiety.

The data was collected from two types of schools that are government schools and private schools.. The distribution of both these school types in the sample has been in the 1:1 ratio. Out of sample size of 500, 250 are from government schools and rest 250 are from private. Out of total sample of 500 students, there were 250 students that belong to government score and rest 250 to private school.

The mean anxiety score and standard deviation of anxiety scores of government are found to be 36.51 and 6.23 respectively, and that for private schools are 27.86 and 10.33 respectively.

H0: There is no difference in anxiety level between students of government and private schools.

H1: There is significant difference in anxiety level between students of government and private schools.

School type	N	Mean Anxiety Score	Standard Deviation	Standard Error	T value	Sig/Not sig
Government	250	36.51	6.23	0.38	11.41	Sig at 0.01 level
Private	250	27.86	10.33	0.65		

The t-value has come out be 11.41 that is more than t value at 99% confidence interval with 498 degrees of freedom i.e. 2.58. Hence it can be concluded that there is significant difference in levels of anxiety between students of government and private schools.

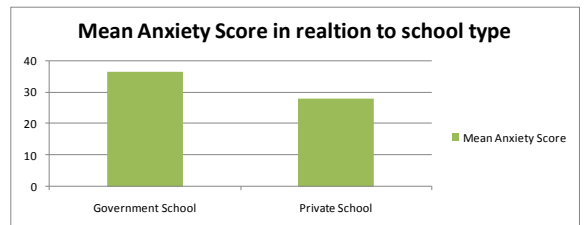


Fig 1 : Graphical representation of School type and mathematics anxiety.

2.Relationship between parental education and mathematics anxiety of children.

Parents play an important role in child’s learning. Besides from being actively involved in his/her education, parents also provide a home environment that impacts learning. Parental education can serve as an indicator of the values and resource with which parents create this environment. To understand impact of parental education better, we analyzed the impact of father’s and mother’s education separately to discuss the impact.

A:Father’s Education

Father’s education has been categorized into no education, low, middle and high education.

(a). H0: There is no difference in anxiety scores of students having father with no and low education

H1: There is difference in anxiety scores of students having father with no and low education

Education Level	N	Mean	Standard Deviation	SE	T value	Sig/not sig
No	130	34.69	6.94	0.61	3.01	Sig. at 0.01 level
Low	192	32.12	8.29	0.60		

The mean scores of students having no education of father is 34.69, and that of low education is 32.12. T value comes out 3.01 that is more than 2.59 i.e. t value at 99% confidence interval with 320 degrees of freedom. We can conclude that there is difference in anxiety scores of students having father with no and low education. The anxiety will

be high among students having father with no education as compared to students having father with lower education.

(b).H0: There is no difference in anxiety scores of students having father with no and middle education

H1: There is difference in anxiety scores of students having father with no and middle education

Education Level	N	Mean	Standard Deviation	SE	T value	Sig/not sig
No	130	36.45	6.94	0.61	6.53	Sig at 0.01 level
Middle	94	29.50	8.48	0.87		

The t value calculated in this case is 6.53 that is higher than 2.60 that is the critical t-value at 99% confidence interval with 222 degrees of freedom. Hence we can conclude that there is difference in anxiety scores of students having father with no and middle education. As observed, mean anxiety scores in students having middle educated father is less than that having no education

(c).H0: There is no difference in anxiety scores of students having father with no and high education

H1: There is difference in anxiety scores of students having father with no and high education.

Education Level	N	Mean	Standard Deviation	SE	T value	Sig/not sig
No	130	36.45	6.94	0.61	10.80	Sig at 0.01 level
High	84	23.98	9.00	0.98		

The mean of no education and high education group is 36.45 and 23.98 respectively and SD is 6.94 and 9.00 respectively. T value has been calculated as 10.80 which is more than the critical t-value at 212 degrees of freedom i.e. 2.60. Hence, null hypothesis is rejected at 99% confidence interval and there is difference in anxiety scores of students having father with no and high education.

(d).H0: There is no difference in anxiety scores of students having father with low and middle education

H1: There is difference in anxiety scores of students having father with low and middle education

Education Level	N	Mean	Standard Deviation	SE	T value	Sig/not sig
Low	192	32.12	8.29	0.60	2.67	Sig at 0.01 level
Middle	94	29.50	8.48	0.87		

The t-value has been calculated as 2.67, which is more than 2.59 (critical value at 282 degrees of freedom at 99% confidence interval), that means null hypothesis is rejected and there is significant difference in anxiety scores of students having father with low and middle education

(e).H0: There is no difference in anxiety scores of students having father with low and high education

H1: There is difference in anxiety scores of students having father with low and high education

Education Level	N	Mean	Standard Deviation	SE	T value	Sig/not sig
Low	192	32.12	8.29	0.60	7.08	Sig. at 0.01 level
High	84	23.98	9.00	0.86		

The t-value has been calculated as 7.08, which is greater than the critical t-value at 274 degrees of freedom, that means null hypothesis is rejected and there is significant difference in anxiety scores of students having father with low and high education.

(f).H0: There is no difference in anxiety scores of students having father with middle and high education

H1: There is difference in anxiety scores of students having father with middle and high education

Education Level	N	Mean	SD	SE	T value	Sig/not sig
Middle	94.00	26.72	8.48	0.87	2.69	Sig at 0.01 level
High	84.00	23.98	9.00	0.98		

The t-value has been calculated as 2.69, that is again more than 2.6 which is the critical value at 99% confidence interval with 176 degrees of freedom, that means null hypothesis is rejected and there is significant difference in anxiety scores of students having father with middle and high education.

Hence in all cases as the null hypothesis is rejected at 99% confidence interval and there is significant difference in scores for each group, it can be concluded that father's education can impact the anxiety scores among the students. We can conclude that the anxiety scores of students having father with no education is greater than the other three.

B:Mother's Education

Mother's education has been categorized into no education, low, middle and high education.

(a).H0: There is no difference in anxiety scores of students having mother with no and low education

H1: There is difference in anxiety scores of students having mother with no and low education

Education Level	N	Mean	Standard Deviation	SE	T value	Sig/not sig
No	59	36.19	5.15	0.66	2.62	Sig at 0.01 level
Low	126	33.98	6.30	0.55		

The mean scores of students having mother with no education is 36.19, and that of low education is 33.98. T value comes out 2.62 that is more than 2.59 i.e. t value at 99% confidence interval with 183 degrees of freedom. We can conclude that there is difference in anxiety scores of students having mother with no and low education.

(b).H0: There is no difference in anxiety scores of students having mother with no and middle education

H1: There is difference in anxiety scores of students having mother with no and middle education

Education Level	N	Mean	Standard Deviation	SE	T value	Sig/not sig
No	59	36.19	5.15	0.67	6.78	Sig. at 0.01 level
Middle	188	29.50	9.92	0.72		

The t value calculated in this case is 6.78 that is higher than 2.59, that is the critical t-value at 246 degrees of freedom at 99% confidence interval. Hence we can conclude that there is difference in anxiety scores of students having mother with no and middle education. Hence we can conclude that there is difference in anxiety scores of students having mother with no and middle education

(c).H0: There is no difference in anxiety scores of students having mother with no and high education

H1: There is difference in anxiety scores of students having mother with no and high education

Education Level	N	Mean	Standard Deviation	SE	T value	Sig/not sig
No	59	36.19	5.15	0.67	10.23	Sig. at 0.01 level
High	127	25.27	9.36	0.83		

The mean of no education and high education group is 36.19 and 25.27 respectively and SD is 5.15 and 9.36 respectively. t value has been calculated as 10.23 that is more than critical t-value at 184 degrees of freedom i.e. Null hypothesis is rejected at 99% confidence interval and there is difference in anxiety scores of students having mother with no and high education.

(d).H0: There is no difference in anxiety scores of students having mother with low and middle education

H1: There is difference in anxiety scores of students having mother with low and middle education

Education Level	N	Mean	Standard Deviation	SE	T value	Sig/not sig
Low	126	33.98	6.30	0.56	2.67	Sig. at 0.01 level
Middle	188	29.50	9.96	0.73		

The t-value has been calculated as 2.67 and it is more than the critical t-value at 324 degrees of freedom i.e. 2.59, that means null hypothesis is rejected and there is significant difference in anxiety scores of students having mother with low and middle education.

(e).H0: There is no difference in anxiety scores of students having mother with low and high education

H1: There is difference in anxiety scores of students having mother with low and high education

Education Level	N	Mean	Standard Deviation	SE	T value	Sig. /not sig
Low	126	33.98	6.30	0.56	8.69	Sig. at 0.01 level
High	127	25.27	9.36	0.83		

The t-value has been calculated as 8.69, and it is more than the critical t-value at 260 degrees of freedom i.e. 2.59. Hence null hypothesis is rejected and there is significant difference in anxiety scores of students having mother with low and high education.

(f).H0: There is no difference in anxiety scores of students having mother with low and high education

H1: There is difference in anxiety scores of students having mother with low and high education

Education Level	N	Mean	Standard Deviation	SE	T value	Sig./ not sig.
Middle	188	32.78	9.96	0.72	5.91	Sig. at 0.01 level
High	84	25.26	9.36	1.02		

The t-value has been calculated as 5.91 which is more than the critical t-value at 270 degrees of freedom i.e. 2.59. Hence null hypothesis is rejected and there is significant difference in anxiety scores of students having mother with middle and high education.

Hence in all cases as the null hypothesis is rejected at 99% confidence interval and there is significant difference in scores for each group, it can be concluded that mother's education can impact the anxiety scores among the students. It can be inferred that the anxiety level higher among students having mothers with no education than students having mother with lower education, which in turn have more anxiety levels than students having middle or high educated mothers.

Finding and conclusion of the study:

Students studying in government schools are found to be more anxious than those studying in private schools. There was significant difference found in anxiety levels between students of government schools and that of private schools. This can be attributed to higher level of investment and quality of teaching in private schools that have an impact on the learning and development of the child.

There was significant difference found in anxiety levels of students having parents with different levels of education. In case of both father and mother, the children whose parents that are not educated or less education are more anxious than those who have both or one of mother and father having higher level of education. The home environment must be congenial to the child's development and parental education becomes an important factor in building up that environment.

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