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Relationship of attitude and mathematics achievement with mathematics anxiety among secondary school Students

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Abstract
This study examined the relationship of attitude and mathematics achievement with Mathematics Anxiety The population of this study consists of 1000 students having 500 males and 500 females from 20 secondary schools of Lucknow districts. The Mathematics Attitude Scale, Mathematics Achievement Test and A Personal Background assessment Questionnaire were used for data collection, while t-test used for statistical analysis. The results of the analysis showed that the attitude of students and anxiety in it are negative correlated in the study. There is significant difference in anxiety levels of positive and negative scoring students. There is a significant difference find in anxiety levels among students having different levels of achievement.

Keywords: Mathematics Anxiety, Attitude and Mathematics Achievement

1. Introduction

Education is described by Kirk and Gallagher (1983) as the mirror of the society, showing its strengths, weaknesses, hopes, biases and key values of its culture. Thus, education has a definite role to play in the development of people and countries. Education plays a significant role in the development of people because people are the wealth of any nation; therefore, people are viewed as a focus for development. It plays a vital role in the development of the country because education is the source of growth of any country. This may be one of the reasons why United Nations Educational Scientific and Cultural Organization (UNESCO) (2001) declare education a vehicle for and indicator of development.

Mathematics has played a decisive role in building up our civilization. But in doing so, it has also made itself essential for the existence and progress of modern world. In modern world we have to be more and more exact, we make larger use of quantitative terms. We have to be accurate to a split of second. All this requires large calculations and minute mathematical understanding.

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) [5]. It is found among elementary school students (Jackson & Leffinwell, 1999 Steele & Arth, 1998); high school students (Hembree, 1990) and in college students (Tobias, 1990, Bitner *et al* 1990).

Mathematics anxiety and students attitude towards the leaning of mathematics countinue to attract the attention of researches because of their association with students learning and achievement in mathematics. If your attitude is positive towards maths, you will most likely enjoy performing the task and you have low level of anxiety. A negative attitude tawards mathematics will cuases you to dislike the task and you have high level of math anxiety. Thus attitude, part of a student's disposition, influence the level of mathematics anxiety. Students who suffer mathematics anxiety have accepted that they fail in any mathematics situation. Furthermore, the student cannot cope with the frustration of not being able to keep up with the class and student's negative attitude forms a barrier preventing any further learning.

Attitude are inclinations and predispositions that guide an individual's behavior (Rubinsternin,; 1986) and persuade to an action that can be evaluated as either positive or negative (Fishbein and Ajzen, 1975).

Student's negative attitude towards mathematics can be attributed to both personal and external factors. Mathematics attitude becomes a anxiety if ti begins to determine success on failure despite the student's ability. Student's attitude towards mathematics that are not necessarily positive even though they continue to study it. These students see mathematics as services subject or something that must be endured to further their careers (Walmsley, 2000).

Changing a student's negative attitude towards mathematics an building confidence will improve the student's anxiety. Fiore (1999) referring to students who have had very damaging mathematics related experiences states that with the mathematics anxious student it is important to help the student realize that mathematics anxiety is common and to reassure the student that he or she is not alone in his or her feelings of insecurity. According to Bush (1991) attitudes and enthusiasm towards a subject than instruction variables.

Anxiety in mathematics has raised several important questions for educational researchers. What factors promote anxiety in

students? How far do the different factors contribute towards anxiety? Therefore many factors have been hypothesized and researched upon and researchers have come out with different results, at time, complementing each other but at times contradicting each other.

Objectives:

1. To study the relationship between attitude towards mathematics of secondary school students and mathematics anxiety.
2. To study the impact of anxiety on mathematics achievement of secondary school students.

Hypotheses:

1. There is no significant relationship between attitude towards mathematics and anxiety in mathematics of students.
2. There is no significant difference in the anxiety of the students having different levels of achievement.

Tools used

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

1. 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.

2. Mathematics Attitude scale (MAS).

The test was developed by Dr. Ali Imam, Associate professor Department of education Integal University Lucknow.

3. Mathematics Achievement test (MAT).

The test was developed by Dr. Ali Imam, Associate professor Department of education Integal University Lucknow.

4. A Personal and Environmental Factors Assessment Questionnaire

This questionnaire was prepared by the investigator.

2. Methodology

The research was conducted in Lucknow (U.P).The researcher selected the sample mainly from the city, Lucknow, U.P India. Simple random sampling methodology was used. Only secondary schools were selected for the study. The sample size was limited to 1000 students. The study was conducted taking different variable which contribute towards mathematics anxiety but only Attitude and Mathematics Achievement are selected. In the study 500 male and 500 female students were administered and taking into consideration.

Following statistical techniques were used for analyzing the data:

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

3. Results and Analysis:

1. Relationship between Mathematics Anxiety and Attitude

Attitude	N	Mean score	SD	df	t-Value	Sig./Not sig.
Positive	630	28.79	7.379	998	24.25	0.05
Negative	370	39.77	6.002			

The total numbers of Positive and Negative students are 630 and 370 respectively as indicated by the table. The mean anxiety score of positive attitude students is 28.79 with SD of 7.379 and for Negative attitude students, the mean score is 39.77 with SD of 6.002. T-value has been calculation as 24.25 that is more than critical t-value of 1.96 at 95% confidence interval with df 998. Hence null hypothesis is rejected that means “there is significant difference in anxiety levels of positive and negative scoring student.”

2. Relationship between Mathematics Achievement and Mathematics Anxiety

Levels of Achievement	N	Mean score	SD	df	t-Value	Sig./Not sig.
High	160	22.86	6.46	998	24.99	0.05
Low	840	34.77	7.67			

Table shows the no. of respondents having high and low scores in mathematics is 160 and 840 respectively. The mean anxiety of students having high scores is 22.68 with SD of 6.46 and for law scores, the mean is 34.77 with SD of 7.67. T-value has been calculated as 24.99 that is more than critical t-value of 1.96 at 0.05 level of significance with 998 degree of freedom. Hence null hypothesis is rejected, that means “there is significant difference in anxiety levels of high and low scoring students.

4. Discussion

It is generally believed that student attitude towards a subject determines their success in that subject. In other words, favorable attitude result to good achievement in a subject. A student’s constant failure in a school subject and mathematics in particular can make him to believe that he can never do well on the subject thus accepting defeat. On the other hand, his successful experience can make him to develop a positive attitude towards learning the subject. This suggests that student’s attitude towards mathematics could be enhanced through effective teaching strategies.

The present study investigates the relationship between mathematics anxiety and attitude. The results shows that the students positive attitude towards mathematics in medium of low level of anxiety. The result is supported by Lawsha Mohamed and Hussain Waheed (2011) found that students positive attitude towards mathematics is medium of low level of anxiety. Karger. M (2010) found that negative moderate correlation between mathematical thinking and mathematics anxiety. Yarath. H (2012) found in his study that there is significant differences in attitude and in mathematics scores. Asante (2012) [3] investigate senior high school student’s attitude towards mathematics and found that male in this study showed more positive attitudes and less anxiety than females. Thus, anxiety in mathematics is functionality dependent on attitude of the students towards learning mathematics. It indicates that students with favorable attitude towards

mathematics may perform better in anxiety test in mathematics as compared to the students with unfavorable attitude. In the light of the above discussion it is evident that attitude of the learners are the important correlates of their achievement in mathematics.

The negative effect of achievement scores on anxiety level have clearly come out in the present study. Ma (1999) [16] found that the relationship between mathematics achievement and mathematics anxiety is significant. A review of current research suggests that low achievers in mathematics frequently accompany the incidence of mathematics anxiety.

Zakari (2008) investigated the effects of mathematics anxiety on matriculation students as related to achievement findings also revealed a low but significant negative correlation between mathematics anxiety and achievement. Khatoon, Tahira (2010) [13] founds that a significant negative correlation between math anxiety and math achievement.

5. Finding and conclusion of the study:

1. The attitude towards math of students and anxiety in it are negative correlated in the study. There is significant difference in anxiety levels of positive and negative scoring students. Their positive attitude of students in math, the less is the anxiety in math.

2. There is a significant difference find in anxiety levels among students having different levels of achievement. Students having high achievement in mathematics have less anxiety levels than that of low achieving students.

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