

COMPARASION OF MATHEMATICS ANXIETY AND PROBLEM SOLVING ABILITY AMONG SECONDARY SCHOOL STUDENTS

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ABSTRACT

As education has come under criticism from many sectors, educators have looked for ways to reform teaching, learning, and the curriculum. Problem solving has become the means to rejoin content and application in a learning environment for basic skills as well as their application in various contexts. Therefore the objective of the present study was to compare the mathematics anxiety and problem solving ability among secondary school students with respect to gender. Sample consisted of 100 number of secondary school students selected randomly studying in grade IX from Ambala district. Out of 100 students 50 boys and 50 girls selected randomly. The tools used were mathematics anxiety rating scale- India (MARS-I) by Karimi and Venkatensan (2011) and Problem solving ability test by Dubey (2008). The findings revealed no significant difference between problem solving ability and mathematics anxiety of male and female secondary school students.

Keywords: mathematics anxiety, problem solving ability, secondary school students.

Introduction

Mathematics anxiety is defined as a term to describe the panic, helplessness, paralysis and mental disorganization that arise among some people when they are required to solve a mathematical problem (Tobias & Weissbrod, 1980). Mathematics anxiety is a panic state which keeps one's thoughts under control (Buxton, 1981).

Mathematics anxiety is not innate. People do not have mathematics anxious before going to school (Williams, 1988). Morris (1981) defined mathematics anxiety as a phenomenon which is

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one's illogical fear that when one thinks of mathematics. This fear causes one to freeze up, prevents one's learning and performance, and causes distress. Mathematics anxiety is —an emotion that blocks a person's reasoning ability when confronted with a mathematical situation (Spicer 2004, p. 1). Math anxiety is defined as a feeling of apprehension, tension or fear that interferes with math performance (Ashcraft, 2002).

Problem solving ability

Problem solving is that process which begins from cognitive situations and ends in achieving desired goals. It is an ability to choose among various responses in order to accomplish a task successfully. Problem solving involves understanding of the problem, analysis of data, looking for hidden questions, estimating a reasonable answer, setting up and solving the conditional statements and checking the answers.

Problem solving is a mental process and is part of the larger problem process that includes problem finding and problem shaping. Considered the most complex of all intellectual functions, problem solving has been defined as higher-order cognitive process that requires the modulation and control of more routine or fundamental skills. Problem solving occurs when an organism or an artificial intelligence system needs to move from a given state to a desired goal state.

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Problem solving is a basic skill needed by today's learners. Guided by recent research in problem solving, changing professional standards, new workplace demands, and recent changes in learning theory, educators and trainers are revising curricula to include integrated learning environments which encourage learners to use higher order thinking skills, and in particular, problem solving skills.

Yua, She and Leec (2010) conducted a study on the effects of Web-based/non-Web-based problem-solving instruction and high/low achievement on students' problem-solving ability and biology achievement. This study investigates the effects of two factors: the mode of problem-solving instruction (i.e. Web-based versus non-Web-based) and the level of academic achievement (i.e. high achievers versus low achievers) on students' problem solving ability and

biology achievement. A quasi-experimental design was used, in which the experimental group received six weeks of Web-based problem solving instruction in biology and the control group received non-Web-based problem-solving instruction for the same content and for the same period of time. Pre-tests, post-tests and retention tests of problem-solving and biology achievement were administered before and at two different time intervals after the instruction. With the pre test scores as a covariate, the results of MANCOVA followed by protected univariate F tests suggest that Web-based problem-solving instruction has the potential to enhance and sustain the learner's problem-solving skills over an extended period of time.

Pathak and Tiwari (2017) conducted a study on relationship between problem solving ability and academic achievement of higher secondary level students. The sample included of 100 students studying in class XI of different higher secondary school of Jabalpur. The collected data has been studied and subjected to statistical analysis. The result of the study revealed that relationship between problem solving ability and academic achievement is highly positive.

Alday and Panaligan (2013) conducted a study on reducing math anxiety of ccs students through e-learning in analytic geometry. This study was conducted in an undergraduate level with the use of e-learning particularly in analytic geometry to lessen the common fear of Filipino students to mathematics. It was found out from the results of the exams for the particular topics that there is a positive effect on the use of e-learning since there is an improved score of the experimental class on the topics considered thus reducing math anxiety.

Yuliani, Suryadi and Dahlan (2019) conducted a study on Analysis of mathematics anxiety of junior high school students. This study aims to determine mathematics anxiety (MA) of junior high school students. The method used in this research is descriptive. The sample of this study was 94 students of junior high school. MA instruments are modified from some valid and reliable test MA. The results showed that the MA of junior high school students was at a moderate level. Increased anxiety occurs in grade 8. The greatest student anxiety occurs when students are facing math tests and when completing math tasks.

OBJECTIVES OF THE STUDY

1. To study mathematics anxiety and problem solving ability among secondary school students.

2. To compare mathematics anxiety of boys and girls secondary school students.
3. To compare problem solving ability of boys and girls secondary school students.

HYPOTHESES

H1: There is no significant difference between boys and girls of secondary school students in respect of their mathematics anxiety.

H2: There is no significant difference between boys and girls of secondary school students in respect of their problem solving ability.

DELIMITATIONS OF THE STUDY

1. The study was delimited to secondary school students studying in 9th class of Ambala district of Haryana
2. The study was delimited to schools affiliated to Haryana Board of School Education
3. The study was delimited to certain demographic variables viz., Gender (boys and girls)

METHODOLOGY

This study utilized survey techniques due to its descriptive nature. This section was comprised of sample, research tools and procedure of the data collection.

Sample: The present study was conducted on a sample of 100 students. Out of 100 students 50 boys & 50 girls were randomly selected from secondary schools of Ambala district. The ages of the students ranged from 13 to 16 years.

Tools Used

The researcher used the following tools for collecting the data to study the research in hand.

1. Mathematics Anxiety Rating Scale-India (MARS-I) by Karimi and Venkatesan(2011).
2. Problem solving ability test by Dubey (2008).

PROCEDURE OF DATA COLLECTION

The data was collected with the prior permission from principals of the selected schools and concerned teachers. The administration of the tool viz., mathematics anxiety rating scale-India (MARS-I) by Karimi and Venkatesan (2011) and problem solving ability test by Dubey (2008) was completed following the instructions given in the tool.

ANALYSIS OF THE DATA

The data was analyzed using descriptive analyses (Mean, Standard Deviations) differential analyses (“t”- test). The hypotheses were tested at varying level of significance.

RESULTS AND DISCUSSION

Table 1: Mean, SD and t-value showing difference in problem solving ability of male and female secondary school students

Gender	N	Mean	SD	t-ratio
Male	50	5.10	5.32	-0.593
Female	50	1.80	1.90	

The objective of the study was to find out significant difference in the problem solving ability of male and female secondary school students. Table 1 shows that t-value 0.593 was found to be insignificant at .05 level of significance. Thus null hypothesis stating no difference exists between problem solving ability of male and female, is accepted. So, it can be concluded that both male and female have same problem solving ability in mathematics.

Table 2: Mean, SD and t-value showing difference in mathematics anxiety between male and female students of secondary school

Gender	N	Mean	SD	t-ratio
Male	50	91.3	24.24	0.641
Female	50	88.4	20.85	

The second objective of this study was to find out the significant difference between the mathematics anxiety of male and female secondary school students. Table 2 shows that t- value is 0.641 which is way less than the table value at 0.05 levels. So the null hypothesis stating there exists no significant difference between mathematics anxiety of both male and female students of secondary school, is accepted. So, it can be concluded that mathematics anxiety of both male and female students of secondary school is same.

It here by implies that girls and boys are almost similar on anxiety in mathematics subjects. Means and S.D. of boys and girls on the measure of problem solving ability are 5.10 & 1.80 and

5.32 & 1.90 respectively. When the t-test was applied to compare the mean scores of problem solving ability of both the groups, t-value was found to be insignificant at 0.05 levels of significance. So Hypothesis I is accepted. It here by implies that girls and boys are same on problem solving ability. There is no significant difference between boys and girls of secondary school students in respect of their mathematics anxiety. The results of the study revealed that girls and boys are almost similar on anxiety in mathematics subject; girls and boys are almost similar on problem solving ability.

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