

MATHEMATICAL PROBLEM SOLVING ABILITY IN RELATION TO ACHIEVEMENT IN MATHEMATICS OF HIGHER SECONDARY STUDENTS

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ABSTRACT

The main objective of the study is to find out the Mathematical Problem Solving Ability in relation to Achievement in Mathematics of Higher Secondary Students. Survey method was adopted in this study. The sample consisted of 1046 higher secondary students. Mathematical Problem Solving Ability test developed and validated by P.Renganathan and S.Francisca (2015) had been used to collect data. Mean, Standard Deviation, 't'-test and Pearson Product Moment Correlation were used to analyze the data. The findings of the study were that there is significant difference between the mean scores of mathematical problem solving ability of higher secondary students with reference to gender, Class and Group. Then there is significant difference between the mean scores of achievement in mathematics of higher secondary students with reference to gender, Class, Group and Nature of School. Significant correlation was found between Mathematical Problem Solving Ability and Achievement in Mathematics of higher secondary students with respect to background variables.

Key words :Mathematical problem solving Ability Achievement in Mathematics Higher Secondary students

Introduction

A major goal of education is to help students learn in ways that enable them to use what they have learnt to solve problems in new situations. In short, problem solving is fundamental to education because educators are interested in improving student's ability to solve problems. A mathematical problem solving ability is the ability that is amenable to being represented, analyzed, and possibly solved, with the methods of mathematics. Mathematical problem has been interpreted in various ways by mathematics educators. There is a general agreement, however, that mathematical problems refers to a situation that requires one to make decisions. The term achievement in mathematics is often naively understood in terms of pupil's scores on a certain maths subject. Achievement in Mathematics means one's learning attainments, accomplishments, proficiencies in Mathematics. According to Denis Baron and Harold W.Bernard, the concept of Achievement in Mathematics involves the interaction of three factors

namely aptitude for learning, readiness for learning and opportunity for learning. For the present study, achievement in mathematics as a total score obtained by an individual as measured in the test constructed by the investigator in mathematics of the selected topics covering the cognitive domain of the behaviours namely knowledge, understanding and critical thinking. The investigators expect a functional relationship between Mathematical Problem Solving Ability and Achievement in Mathematics.

Statement of the Problem

- The achievement in Mathematics depends on the Mathematical Problem Solving Ability of the higher secondary students which is highly associated.
- This study investigates the relationship between the above variables among the higher secondary students.

Significance of the Study

The Primary goal of this study is to find out the Achievement in Mathematics involves the higher cognitive process of

human beings. It may be considered as the highest stage of the evaluation in cognitive domain. Acquiring knowledge should help a person distinguish what is right? and what is wrong? To have discerning eye, one has to train his mental faculties.

The ultimate goal of any problem solving ability is to improve students' performance at solving problem correctly. The specific goals of problem solving ability in mathematics are to improve pupil's willingness to try problems, make pupils aware of the problem solving ability, make pupils aware that many problems can be solved in more than one way and improve pupils abilities to get more correct answers to problems.

Objective of the Study

1. To find out the significant difference if any between the mean scores of mathematical problem solving ability and Achievement in Mathematics of higher secondary students with reference to Gender, Class, Group and Nature of School.
2. To find out the significant correlation between mathematical problem solving ability and achievement in mathematics of higher secondary students with reference to total sample.

Hypotheses of the Study

1. There is no significant difference between the mean scores of mathematical problem solving ability of higher secondary students with reference to Gender, Class, Group and Nature of School.
2. There is no significant difference between the mean scores of Achievement in Mathematics of higher secondary students with reference to Gender, Class, Group and Nature of School.
3. There is no significant correlation between mathematical problem solving ability and achievement in mathematics of higher secondary students with reference to Gender, Class, Group and Nature of School.

Methodology

The researchers had adopted descriptive method using survey as a technique to study the mathematical problem solving ability in relation to achievement in mathematics of higher secondary students. The investigators felt that the adoption of survey method would be more relevant and desirable to solve the present problem. The population for the present study consisted of the students studying in higher secondary classes in schools of Virudhunagar, Tuticorin and Madurai. The investigators had drawn a samples of 1046 students of XI and XII classes through simple random sampling technique. The following research tools had been used to collect data

1. Mathematical Problem Solving Ability Test developed and validated by P.Renganathan and S .Francisca.
2. Achievement Test in Mathematics developed and validated by P.Renganathan and S .Francisca.

To analyse the data the following statistical measures had been employed.

1. Mean
2. Standard Deviation
3. 't'-test
4. Correlation Analysis

Table-1

Difference between the mean scores of mathematical problem solving ability of higher secondary students with reference to gender

Variable	Category	Count	Mean	Standard Deviation	t-value	Remarks
Gender	Male	533	30.01	4.638	4.220	S
	Female	513	28.80	4.620		

From the above table it is clear that the calculated value 4.220 is greater than the table value 1.960 at 5% level of significance. Therefore, there is significant difference between the male and female students in mathematical problem solving ability. Comparing the

mean scores the male students' problem solving ability is greater than the female.

Table-2

Difference between the mean scores of mathematical problem solving ability of higher secondary students with reference to class

Variable	Category	Count	Mean	Standard Deviation	t-value	Remarks
Class	XI	552	31.11	2.944	12.996	S
	XII	494	27.53	5.450		

From the above table it is evident that the calculated value 12.996 is greater than the table value 1.960 at 5% level of significance. Therefore, there is significant difference between the mean scores of mathematical problem solving ability of higher secondary students with reference to Class. Comparing the mean scores the problem solving ability of XI class students is greater than the students of XII class.

Table-3

Difference between the mean scores of mathematical problem solving ability of higher secondary students with reference to group

Variable	Category	Count	Mean	Standard Deviation	t-value	Remarks
Group	Bio Maths	545	30.01	4.140	4.253	S
	Computer Maths	501	28.78	5.106		

From the above table it is inferred that the calculated value 4.253 is greater than the table value 1.960 at 5% level of significance. Therefore, there is significant difference between the mean scores of mathematical problem solving ability of higher secondary students with reference to Group. Comparing the mean scores the first group students exhibit greater problem solving ability than their counterparts.

Table-5

Difference between the mean scores of achievement in mathematics of higher secondary students with reference to gender

Variable	Category	Count	Mean	Standard Deviation	t-value	Remarks
Gender	Male	533	22.19	3.665	4.693	S
	Female	513	21.13	3.591		

From the above table it is evident that the calculated value 4.693 is greater than the table value 1.960 at 5% level of significance. Therefore, there is significant difference between the mean scores of achievement in mathematics of higher secondary students with reference to gender. Comparing the mean scores the male students' achievement is better than the female students.

Table-6

Difference Between The Mean Scores Of Achievement In Mathematics Of Higher Secondary Students With Reference To Class

Variable	Category	Count	Mean	Standard Deviation	t-value	Remarks
Class	XI	552	21.31	3.135	3.319	S
	XII	494	22.07	4.146		

From the above table it is clear that the calculated value 3.319 is greater than the table value 1.960 at 5% level of significance. Therefore there is significant difference between the mean scores of achievement in mathematics of higher secondary students with reference to Class. Comparing the mean scores the students of XII standard is greater than the students of XI standard.

Table-7

Difference between the mean scores of achievement in mathematics of higher secondary students with reference to group

Variable	Category	Count	Mean	Standard Deviation	t-value	Remarks
Group	Bio Maths	545	22.48	3.325	7.554	S
	Computer Maths	501	20.80	3.818		

From the above table it is pictured that the calculated value 7.554 is greater than the table value 1.960 at 5% level of significance. Therefore, there is significant difference between the mean scores of achievement in mathematics of higher secondary students with reference to Group. Comparing the mean scores the students of Computer Science and Maths group achieve better than the students of Bio- Maths group.

Table – 9

Correlation between mathematical problem solving ability and achievement in mathematics of higher secondary students with reference to gender, class, group and nature of school.

Variable	Category	Count	Calculated 'r' Value	Table Value	R
Gender	Male	533	0.445	0.622	NS
	Female	513	0.322	0.622	NS
Class	XI	552	0.233	0.062	S
	XII	494	0.594	0.088	S
Group	Bio Maths	545	0.362	0.062	S
	Computer Maths	501	0.394	0.062	S

The above table-5 shows that, there is significant positive correlation between mathematical problem solving ability and achievement in mathematics of higher secondary students with reference to class, group and nature of school. But there is no significant correlation between problem solving ability and achievement in Mathematics of higher secondary student with respect to gender.

Conclusion

The study brings to the limelight that there are significant difference between the mean scores of mathematical problem solving ability of higher secondary students with reference to gender, Class and Group. There is significant difference between the mean scores of achievement in mathematics of higher secondary students with reference to gender, Class, Group and Nature of School. And there is significant positive correlation between mathematical problem solving ability and achievement in

mathematics of higher secondary students with reference to Class, Group and Nature of School. The present study is confined only to higher secondary students. Similar studies can be conducted on students of primary, middle, high school students, colleges and universities. The study can be extended to other districts of TamilNadu.

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