



PROBLEM SOLVING ABILITY AND ACADEMIC ACHIEVEMENT OF HIGHER SECONDARY STUDENTS

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Abstract

Problem solving has a special importance in the study of mathematics. The primary goal of mathematics teaching and learning is to develop the ability to solve a wide variety of complex mathematics problems. A problem is an obstruction of some sort to the attainment of an objective, a sort of difficulty which does not enable the individual to reach a goal easily. The present study aims to find out the relationship between problem solving ability and achievement in mathematics of higher secondary students. Fifty five, higher secondary students were randomly selected as sample. Survey method was adopted for the study. The data was collected using a test on problem solving ability. The t-test, chi-square test and person's product moment correlation were applied to test the hypotheses. Interpretations were drawn based on the findings. Problem solving ability of the higher secondary students was found to be an average and there was a high positive correlation between problem solving ability and achievement in mathematics.

Key Words: Reasoning Ability, Academic Achievement, School Students

Introduction

Today's society is required to produce well-educated people who have the ability to adapt themselves to the rapidly changing and developing world. Social, economic, political and technological changes in social structure have become more complicated. Our times are marked by the speed with which change occurs and this leaves an individual facing new problems and challenges each day. As in all scientific processes, problem solving should be realised in our daily life. It is common knowledge that all through history people have solved or attempted to solve problems using the trial and error method. The process of problem solving begins with the perception of the problem and finishes with evaluation. Even though problem solving shows differences according to the problems

and the individuals, the main steps of problem solving are problem understanding, planning for solution, application of plan and evaluating results.

Need and Significance of the study

Mathematical problems play an important role in helping students to participate in problem-solving activities and stimulate their learning abilities. The problems should be challenging enough for students to solve in order to enhance their knowledge and comprehension. This type of activity develops students' curiosity in solving mathematics problems and successfully enhances their cognitive processes

Objectives of the study

1. To find out whether there is any significant relationship between problem solving ability and academic achievement in mathematics of higher secondary students.
2. To find out whether there is any significant difference in achievement in mathematics of higher secondary students with respect to
 1. Gender
 2. Group of study
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4. To find out whether there is any significant difference between problem solving ability and academic achievement in mathematics of higher secondary students with respect to their type of school.

Method of Study

Survey method was adapted for the study

Research tools

The following research tool will be adopted

1. Problem Solving Ability Test (PSAT) was constructed and validated by Dr.Saraswathy.R and K.Balasubramanian (2022)

Sample of the study

Fifty five higher secondary students were selected using random sampling technique from various schools of Thiruchirappalli district for the study.

Statistical techniques used

This study utilizes descriptive and differential analysis

Testing of Hypotheses

Hypothesis 1

There is no significant relationship between problem solving ability and achievement in mathematics of higher secondary students.

Variables	R	Table value
problem solving ability and achievement in mathematics	0.097	0.254

(at 5% level of significance the table value 'r' is 0.254)

It is inferred from the above table that the calculated value of „r“ (0.97) is greater than the table value of „r“ (0.254) at 5% level of significance. Hence the null hypothesis is rejected. Therefore, there is a significant relationship between problem solving ability and achievement in mathematics of higher secondary students. Further, it can be stated that there exist high positive correlation between problem solving ability and achievement in mathematics of higher secondary students.

Hypothesis 2

There is no significant difference between boys and girls higher secondary students“ achievement in Mathematics

Gender	N	Mean	S.D	T value
Boys	30	16.3	4.61	0.397
Girls	25	17.5	4.28	

(at 5% level of significance the table value „t“ is 1.67)

It is inferred from the above table that the calculated value „t“ (0.397) is less than the table value of „t“ (1.67) at 5% level of significance. Hence the null hypothesis is accepted. Therefore, boys and girls higher secondary students“ do not differ significantly in achievement in mathematics.

Hypothesis 3

There is no significant difference in achievement in mathematics of higher secondary students with respect to group chosen

Group of study	N	Mean	S.D	T value
Bio-Maths	29	16.12	3.63	0.346
C.S-Maths	26	17.94	5.04	

(at 5% level of significance the table value „t“ is 1.67)

It is inferred from the above table that the calculated value „t“ (0.346) is less than the table value of „t“ (1.67) at 5% level of significance. Hence the null hypothesis is accepted. Therefore, higher secondary students whose major group was biology-mathematics and computer science – mathematics did not differ significantly in achievement in mathematics.

Hypothesis 4

There is no significant difference between boys and girls higher secondary students“ problem solving ability in mathematics

Gender	N	Mean	S.D	T value
Boys	30	23.5	4.39	0.45
Girls	25	24.2	6.27	

(at 5% level of significance the table value „t“ is 1.67)

It is inferred from the above table that the calculated value „t“ (0.45) is less than the table value of „t“ (1.67) at 5% level of significance. Hence the null hypothesis is accepted. Therefore, boys and girls higher secondary students do not differ significantly in their problem solving ability in mathematics.

Hypothesis 5

There is no significant difference in problem solving ability in mathematics of higher secondary students with respect to group chosen

Group of study	N	Mean	S.D	T value
Bio-Maths	29	24.06	5.92	0.347
C.S-Maths	26	23.50	4.78	

(at 5% level of significance the table value „t“ is 1.67)

It is inferred from the above table that the calculated value, „t“ (0.347) is less than the table value of „t“ (1.67) at 5% level of significance. Hence the null hypothesis is accepted. Therefore, higher secondary students whose major group was biology-mathematics and computer science – mathematics did not differ significantly in their problem solving ability in mathematics.

Hypothesis 6

There is no significant difference in problem solving ability in mathematics and achievement in mathematics of higher secondary students with respect to type of school.

Type of school	N	Mean	S.D	T value
Govt	19	23.78	5.33	0.49
Private	36	23.60	5.47	

(at 5% level of significance the table value „t“ is 1.67)

It is inferred from the above table that the calculated value „t“ (0.49) is less than the table value of „t“ (1.67) at 5% level of significance. Hence the null hypothesis is accepted. Therefore, higher secondary students studying in government and private schools did not differ significantly in their problem solving ability in mathematics and achievement in Mathematics.

Findings

- 65.5 percentage of higher secondary students had an average level of problem solving ability and achievement in mathematics.
- There is high positive correlation between problem solving ability and achievement in mathematics of higher secondary students.
- Boys and girls higher secondary students do not differ significantly in problem solving ability and achievement in mathematics.
- Higher secondary students whose major group was biology-mathematics and computer science – mathematics did not differ significantly in problem solving ability and achievement in mathematics.
- Higher secondary students studying in government and Private schools did not differ significantly in problem solving ability and achievement in mathematics.

Educational implications

There is high positive correlation was exist between problem solving ability and achievement in mathematics of higher secondary students. For improving problem solving ability among students, teachers can adopt various teaching techniques like heuristic method, blended learning and experimental methods. Special lectures on complex concepts may be arranged to facilitates their learning, guidance programme can be provided in schools according to their knowledge level.

Conclusion

The purpose of the present study was to find the level of problem solving ability in mathematics of higher secondary students. The study result may be useful in the field of education, which may serve as data base for further research.

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