



## Problem Solving Ability of IX Standard Students in Pondicherry Region

### KEYWORDS

Problem Solving ability, IX Standard Students, Pondicherry

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**ABSTRACT** *The present study aims at finding the level of Problem solving ability in Mathematics of IX Standard students and significant difference between the sub samples of the students in respect of their Problem solving ability in Pondicherry region. The investigators have randomly selected 300 students from nine different schools Pondicherry as sample. The Problem solving ability questionnaire developed by L.N Dubey was used to collect the data. The study revealed that the Problem solving ability in Mathematics of IX Standard students is low. Also the results reveal that there is significant difference in Problem solving ability in Mathematics in the sub categories Locality, Type of School and Level of Achievement.*

### INTRODUCTION

Historically, learning mathematics and teaching it to all students at the school stage has been motivated by the belief that a study of mathematics helps students to learn to reason and apply such reasoning to everyday problems. It is believed that learning mathematics leads to learners' cognitive development. Thus, one of the important questions that all mathematics educators must constantly ask themselves is: Does the mathematics that we teach (and that our students learn) lead to an enhancement of students' cognitive abilities?

This leads us to clarify what we mean by the understanding of mathematics that we seek to develop in our students. The deeper understanding that we are looking for must enable students to look at and understand a new situation, delve into the repertoire of mathematical knowledge that they have in terms of concepts, processes, and ideas and adapt or modify those ideas so as to apply them towards resolving a new problem situation. Such understanding calls for building deep connections between concepts, a variety of lenses and representations with which to view the concepts, and flexibility that allows one to sufficiently modify concepts so as to apply them to a new situation. It requires students to develop a rich network of ideas that one may draw from when faced with a novel situation. In this process, students develop habits of the mind that enable them to analyze other situations that they may encounter in life, mathematical or otherwise. This critical blend of processes is what Mathematics educators refer to as problem solving. It is this kind of cognitive development that most modern societies would like their citizens to develop.

Problem solving has a special importance in the study of mathematics. A primary goal of mathematics teaching and learning is to develop the ability to solve a wide variety of complex mathematics problems. Stanic and Kilpatrick traced the role of problem solving in school mathematics and illustrated a rich history of the topic. To many mathematically literate people, mathematics is synonymous with solving problems -- doing word problems, creating patterns, interpreting figures, developing geometric constructions, proving theorems, etc. On the other hand, persons not enthralled with mathematics may describe any mathematics activity as problem solving.

Mathematics teachers talk about, write about, and act upon, many different ideas under the heading of problem solving. Some have in mind primarily the selection and presentation of "good" problems to students. Some think of mathematics program goals in which the curriculum is structured around

problem content. Others think of program goals in which the strategies and techniques of problem solving are emphasized. Some discuss mathematics problem solving in the context of a method of teaching, i.e., a problem approach. Indeed, discussions of mathematics problem solving often combine and blend several of these ideas.

### NEED FOR THE STUDY

To become a good problem solver in mathematics, one must develop a base of mathematics knowledge. How effective one is in organizing that knowledge also contributes to successful problem solving. Kantowski found that those students with a good knowledge base were most able to use the heuristics in geometry instruction. Schoenfeld and Herrmann found that novices attended to surface features of problems whereas experts categorized problems on the basis of the fundamental principles involved.

Silver found that successful problem solvers were more likely to categorize math problems on the basis of their underlying similarities in mathematical structure. Wilson found that general heuristics had utility only when preceded by task specific heuristics. The task specific heuristics were often specific to the problem domain, such as the tactic most students develop in working with trigonometric identities to "convert all expressions to functions of sine and cosine and do algebraic simplification."

The extent of the intended curriculum of making students competent in problem solving and possess higher order thinking skills is always the concern of educators in the country (Noor Azlan Ahmad Zanzali & Lui, 2000).

Hence this study is intended to study the Problem solving ability in Mathematics of the IX standard students.

### OBJECTIVES OF THE STUDY

- To study the level of Problem solving ability in Mathematics of IX standard students.
- To find out the significant differences, if any, in the level of Problem solving ability in Mathematics of IX standard students in terms of their Sex and Locality of School, Type of School, and Level of Achievement in Mathematics.

### STATEMENT OF HYPOTHESIS

- The level of Problem solving ability in Mathematics of IX standard students is high.
- There is no significant difference between the mean scores of Problem solving ability in Mathematics of boys and girls.

- There is no significant difference between the mean scores of Problem solving ability in Mathematics of government and private school students.
- There is no significant difference between the mean scores of Problem solving ability in Mathematics of urban and rural school students.
- There is no significant difference between the mean scores of Problem solving ability in Mathematics of students with different levels of achievement in mathematics.

**METHODOLOGY**

A normative survey was undertaken.

**SAMPLE**

The investigators have randomly selected 300 students from nine different schools in Pondicherry as sample by random sampling technique. Out of this 140 were boys and 160 were girls; 180 were from urban and 120 were from rural area; 160 were from Government and 160 were from private school; and 110 were of high achievement level and 190 were of average achievement level students.

**TOOLS USED**

The following tool has been used for collecting data.

1. Problem solving ability test by L.N. Dubey

**L.N.DUBEY PROBLEM SOLVING ABILITY TEST**

L.N Dubey standardizes the problem solving ability test. This test has been used to measure the problem solving ability of higher secondary school students. It includes 20 problems each of which is followed by four possible alternatives; though all the alternatives are problem oriented and society acceptable yet one of them imply a higher sense of problem solving.

**ANALYSIS AND INTERPRETATIONS**

Mean median, and standard deviation of Problem solving ability scores for whole sample is given in Figure-1.

Figure-1

Variable	N	Mean	Median	Mode	S.D
Problem solving ability	300	8.11	8	8	2.54

From Figure-1, it is concluded that the mean and standard deviation of Problem solving ability scores of IX standard students are 8.11 and 2.54. It is found that the mean score of Problem solving ability falls in the low level. Therefore the level of Problem solving ability of the entire sample is low. Also it is found that from the Figure-2, the mean score of problem solving ability is 8.11. The median and mode are 8 and 8. From these measures, it is concluded that problem solving ability of XI standard students is low.

**Mean and standard deviation of Problem solving ability - category-wise**

Figure-2

Variable	Category	Sub-groups	N	Mean	S.D	t' value	Sig. level (0.05)
Problem solving ability	Sex	Boys	140	7.89	2.41	1.12	NS
		Girls	160	8.22	2.68		
	Locality of school	Urban	180	7.71	2.45	1.99	S
		Rural	120	8.31	2.57		
	Type of school	Govt	140	7.79	2.53	2.52	S
		Private	160	8.39	2.52		
	Level of achievement	High	110	7.44	2.25	7.28	S
		Average	120	9.69	2.42		

**CONCLUSION**

- The level of Problem solving ability of IX standard students is low.
- There is no significant difference between the mean scores of problem solving ability of boys and girls.
- There is a significant difference between the mean scores of problem solving ability of government and private school students.
- There is a significant difference between the mean scores of problem solving ability of urban and rural school students.
- There is a significant difference between the mean scores of problem solving ability of high and average level achievement students.

**SUGGESTIONS FOR FURTHER RESEARCH**

- The study may be undertaken using the students of lower classes as subjects for the study.
- Problem solving ability in relation to other variable such as personality, adjustments and intelligence may be undertaken.
- A study of Problem solving ability in relation to socio-economic status, anxiety, level of aspiration and other sociological variables may be undertaken.
- A comparative study of Problem solving ability of school and college students may be undertaken.

**RECOMMENDATIONS**

- Association or clubs may be formed in various subjects and students may be assigned some responsibility. This would enhance their Problem solving ability.
- Apart from the academic performance, the student may be encouraged to participate in extra-curricular activities like sports and music individually or in groups. They should be encouraged through awards and trophies.
- Teachers and parents should help the students to develop positive Problem solving ability through their approval and interpersonal development.

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