



Problem Solving Ability and Academic Achievement in Mathematics of VII Standard Students in Madurai District

KEYWORDS

Problem solving ability, Achievement.

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ABSTRACT A survey was conducted to find out the relationship between problem solving ability and academic achievement in Mathematics of VII Standard Students in Madurai District. For the present study Problem Solving Scale was used which consists of 25 items under 6 dimensions. The sample consists of 300 Stratified randomly sampled for VII Standard students (includes both gender) procured from 6 different Secondary and Hr. Sec. Schools in Madurai Region. The data collected from the sample was statistically analyzed using SPSS package. The result revealed that the sample at the Problem Solving ability and academic achievement for VII Standard Students. Relationship between Problem Solving and academic achievement is High Positive.

Introduction:

Education system of developed and developing countries is examined by noticing the teaching programs are these countries that are set in accordance with the structuring approach. What is basically important in those systems is not what the student knows, but how and to what extent can the student use and relate the knowledge to real life. In this context, school should not be limited to improve the students learning but support his social development as well, also schools should develop some basic skills of students which are important in Mathematics subject as, inquires, thinkers, communicators, risk-takers, knowledgeable, open minded, principled caring well balanced and reflective.

Many students think that mathematics provides students with basic skills therefore importance of Mathematics is explicit. When the students problem solving ability, which is the basic aim of mathematics improve, the students will become more efficient in problem solving. This idea has been the thinking force of this study. So the investigator decided to find out the relationship between problem solving ability and academic achievement in Mathematics.

Need for the study:

Problem solving is a process of overcoming difficulties that appears to interface with the attainment of a goal. Simple problems can be well solved by instructive and habitual behaviour. More difficult problems require a series of attempts, until the successful solutions is reached, a Mathematical problem like any problem in life is defined as a problem because it causes is much difficulty in attaining a solution. The beliefs of mathematics students, parents, policy makers and the general public about the roles of problem solving in mathematics become prerequisite or co-requisite to develop problem solving. The curriculum and evaluation standards make the point that students need to view Mathematics as capable of using their growing mathematics knowledge to make sense of new problem situations in the world around them. We prefer to think of developing a sense of 'can do' in our students as they encounter mathematical problem.

Background of the study:

The investigator being in the educational area it was observed and felt that, students' had great difficulty in solv-

ing mathematics problems. They did not know the various steps that the problem would contain and were not able to identify the problems correctly. The suggestions through this study are given to curriculum planner, how this difficulty could be eradicated, through the series of steps involving a problem. So that students do not show hatred towards Mathematics problems and help them in their development.

Objectives of the study:

To find out the difference between

(i) Boys and Girls (Gender)

(ii) Urban and Rural (Nature of School)

(iii) Government, Government Aided and Matriculation (Type of Institution) with regards to the student's problem solving ability in Mathematics.

To know the relationship between the problem solving ability in Mathematics and their academic achievement in Mathematics

Hypotheses of the study:

1. There is no significant difference between VII standard boys and girls with regard to their problem solving ability in Mathematics
2. There is no significant difference between VII standard Urban and Rural students with regard to their problem solving ability in Mathematics
3. There is no significant difference between VII Standard Government and Government Aided School Students with regard to their problem solving ability in Mathematics
4. There is no significant difference between VII Standard Government Aided and Matriculation School Students with regard to their problem solving ability in Mathematics
5. There is no significant difference between VII Standard Government and Matriculation School Students with regard to their problem solving ability in Mathematics
6. There is no significant relation between the problem solving ability in Mathematics and their academic achievement in Mathematics.

Statistical techniques:

Arithmetic Mean
Standard Deviation
T test
Correlation

Method Adopted:

This tool includes the test which was constructed on mathematical concepts in practical situations on three areas containing 25 problems from VII class mathematics text book by the investigator. Problem solving skills scale was framed and used by investigator.

Pilot Study:

Preparation of the items:

The tool used is a self-made test, where there are 27 items in questions and answer type.

Reliability:

The tool was administered to 120 students for the first time, which after an interval of 7days the tool was again administered to the 120 students. The Reliability Co-efficient 'r' was computed and the value was found to be 0.81 denoting high reliability of the items.

Validity:

The tool was administered to 120 students in one school, scored and were arranged in ascending order on the basis of the total score obtained. Item analysis was done by employment of 't' test for significant difference between mean scores of high achievers and low achievers. All items which were found to be significant at 0.01 levels were selected for the final level.

Population:

The population of the present study was VII Standard Students studying in Hr. Sec. School in and around Madurai district.

Sample:

The investigator has used normative survey method and stratified representative sampling techniques in selecting the sample. The investigator selected 300 samples selected randomly in six secondary and hr. sec. schools.

Level of Academic Achievement of VII Standard Students

Variable	Sample	Number of samples	Theoretical Mean	Obtained Mean
Academic Achievement	VII Standard Students	300	50	40.55

It may be due to lack of knowledge in problem solving.

There is no difference in the percentage of VII standard students lying in the three levels of Academic Achievement

Level of Academic Achievement	No. of Students	Percentage of Sample
Low	87	29
Moderate	103	34.33
High	110	36.67

Hence the null hypothesis is rejected. There is no difference in the percentage of VII standard students lying in the three levels of Academic Achievement

Hypotheses:

There is significant difference between Male and Female, Rural and Urban, government and Government Aided, Government Aided and Matriculation, Matriculation and Government in their Maths Achievement.

Vari-ables	Sub Vari-ables	N	Mean	SD	T Test	S / NS
Gender	Male	150	19.6	2.70	2.91	S
	Female	150	20.49	2.60		
Area of Resi-dence	Rural	200	19.44	2.85	6.77	S
	Urban	100	21.27	1.81		
Type of Institu-tion	Government	92	6.53	2.28	2.33	S
	Government Aided	129	7.23	2.09		
	Government Aided	129	7.23	2.09	0.83	NS
	Matriculation	79	7.01	1.70		
	Matriculation	79	7.01	1.70	1.57	NS
	Government	92	6.53	2.28		

Usually girls are more attentive in class than boys. They are also able to coverage on the points given by the teacher and so their ability to identify the problems given in higher.

Students are from urban areas are given enough coaching before they attend any exam or test, thus they are able to identify the problem that 'how and what' of the problem is understood by them, coverage of syllabus is also done so that students do not miss to identify any type of problem.

Variables according to the type of school, it plays a main role in problem solving ability in Mathematics. When comparing Government and aided school students, aided school students have higher level of problem solving ability in mathematics.

This may be the scarcity of subject teachers in Government schools. In Government schools, subject teachers other than mathematics also handle mathematics subject. This lead to the students to be uninterested in that subject.

There is no significant relationship between the problem solving ability in Mathematics and their academic achievement.

Correlation between the problem solving ability in Mathematics and their academic Achievement.

Variable	No. Of Sample	'r' value	Res
The whole sample	300	0.673	S

There would be high positive correlation between the Problem Solving Skill and Academic Achievement in Mathematics in 7th standard pupils.

Result:

The pupils who have low learning of mathematical concepts have low problem solving skills. The pupils who have average learning of mathematical concepts have average problem solving skills, and the pupils who have high learning of mathematical abilities are found having high problem solving skills.

Mathematics develops problem solving ability to carry on abstract thinking, reasoning, visualizing and logically dealing with any problem the students encounter with. They develop inherent discipline to approach the problem, instead of avoiding the problem and space perception and depth perception as they develop confidence in solving mathematical problems in class rooms. They try to approach any problem systematically, Analyse the problem systematically whether it is classroom problem or problems of life. This may be the reason for the observed positive correlation found among the learning of mathematical concepts, problem solving skill

Conclusion:

From this study we conclude that student's academic achievement in mathematics have some relation to their problem solving ability in Mathematics. So they can improve the student's problem solving ability in Mathematics in higher level.

Problem solving is at the very heart of understanding mathematics. The whole purpose of teaching the various concepts which make up mathematics as a tool is to give the learner the tools and the building blocks with which he can actually solve problems that is, resolve difficulties which he wants to resolve. Mathematics education today encourages the interpretation and utilization of problem solving in its broadest sense. The teacher is no longer limited totally to the abstract solution of written word problems as traditionally continued in text books. Instead, the teacher may incorporate a variety of techniques to help the child relate the mathematics being learned to situation she or he encounters in life. So the teacher only guides them to improve their abilities especially the problem solving ability in Mathematics. It may be helpful in their future life. In this competitive world everyone should have some ability to face some critical problem. So we must know how to deal and solve it.

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