

Problem Solving Ability of the Adolescents in Relation to their Interest in Science

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ABSTRACT

Problem solving forms an important ingredient of all scientific disciplines and it also constitutes an integral part of mathematics and science programmes at all level of studies viz. primary, secondary and upper secondary, almost everything that an individual does involves problem solving which is directed towards achieving a goal. The present study was designed to seek answers to three questions viz. whether there exist difference in problem solving ability and interest in science among boys and girls, and whether there exist any correlation between problem solving ability and interest in science. The results indicate that there is no significant difference in problem solving ability of girls and boys. The results also show that the difference in interest in science of girls and boys is significant. The coefficient of correlation between the problem solving ability and interest in science of the adolescents was found to be 0.494 which was found significant at 0.01 level of significance in the study.

Keywords: Problem solving, interest in science, adolescent, difference

There is a growing need to focus on teaching science in the early childhood classroom is based on a number of factors affecting the early childhood learning. First and foremost is the increased understanding and recognition of the power of thinking and learning among the children. Many research studies suggested that children have great potential to learn than adults. Therefore, early childhood teaching should focus on providing richer and more challenging environments for learning. In these challenging environments, under the skilful guidance of the teachers, the child's experiences in the early years can have a great impact on learning in later years. In addition to this, science may be a particularly important domain in early childhood. Science not only serves the child to build a base for future scientific understanding but it also to equip the child with important skills and attitudes for learning the scientific concepts. Problem solving is accorded a top priority in large number of curricula in science stream. Teachers are not trained to teach problem solving. Problem

solving strategies involves many formal operational skills such as proportional reasoning, logical and inductive-deductive thinking. Interest is based on instincts and sentiments, just as knowledge of instincts and sentiments help the teacher, similarly knowledge of interest of the pupil make him a more effective teacher. Interest in science can be one of the components contributing in innovation and advancement in science and technology.

PROBLEM SOLVING ABILITY

Problem Solving is a skill which involves logical analysis of the facts and drawing inferences in consistent with the data and facts.

Woodworth and Marqnis (1948) explained that problem solving behaviour occurs in novel or difficult situation in which a solution is not obtainable by the habitual methods of applying concepts and principles derived from past experience in very similar situations.

Skinner (1968) defined problem solving as a process of overcoming difficulties that appears to interfere

with the attainment of a goal. It is a procedure of making adjustment in spite of interferences.

Wilson, Frenendaz and Hadaway (1993) stated that mathematics problem solving has several separate activities such as doing word problems, creating patterns, interpreting figures, developing geometric construction and proving theorems.

Mayer and Wittrock (2006) defined Problem solving as "cognitive processing directed at achieving a goal when no solution method is obvious to the problem solver".

So, problem solving behaviour may be said to be a deliberate and purposeful action on the part of an individual to realise the set goals or objectives by inventing some novel methods or systematically following some planned steps for removal of the interferences and obstacles in the path of realisation of these goals when usual methods like trial and error, habit-formation and conditioning fails.

INTEREST IN SCIENCE

Interest is based on instincts and sentiments, just as knowledge of instincts and sentiments help the teacher, similarly knowledge of interest of the pupil make him a more effective teacher. The term interest have been defined in a varied manners, some of them are given below.

Encyclopaedia of Psychology (1946) describe that the term interest is used to designate a concept pertaining to factors, within an individual which at least attract him or repel him from various objects, persons and activities within his environment.

Crow and Crow (1953) stated that interest may refer to the motivating force that implies us to attend a person, a thing or an activity or it may be the effective experience that has been stimulated by activity itself.

Interests are not purely in born but actually acquired characteristics. They are the result of constant interaction between the instinctive behaviour of the organism and the peculiar environmental factors. Both affect the interest pattern of an individual in the course of his growth and development.

RATIONALE OF THE STUDY

Problem solving has been observed to be one of the principal causes of scholastic failure in areas of science such as mathematics, chemistry and physics

(Perez & Terragosa, 1983). This is because of the fact that pupils do not learn how to solve problems but simply memorize solutions explained by teachers in line with the traditional method of teaching. Problem solving transcends all scientific disciplines and it constitutes an integral part of mathematics and science programmes at all level of studies viz. primary, secondary and upper secondary, almost everything that an individual does involves problem solving which is directed toward achieving a goal. A problem is said to exist whenever there is gap between a present state and an anticipated goal state without any immediate clear picture of how to bridge the gap (Hayes, 1981). Interest also affects the thought process and hence contributes towards the processing of information and perceiving of the problems in life.

Problem solving skill can be used to develop interest and support creative thinking to build a strong foundation of scientific process skills among the students at secondary stage. This study could be of particular interest to the curriculum planners and scientific intelligentsia to groom the spirit of inquiry and build a strong foundation of science education in India.

The results of the study could be specifically significant to the teacher to amend or modify the instructional techniques in the classrooms. The study could be replicated at the level of college education to identify the future technocrats and scientists.

OBJECTIVES OF THE STUDY

- ♦ To study the difference in problem solving ability of the adolescents on the basis of gender.
- ♦ To study the difference in interest in science of the adolescents on the basis of gender.
- ♦ To study the relationship between the problem solving ability and interest in science of the adolescents.

HYPOTHESIS OF THE STUDY

The study was designed to test the following null hypotheses:

- ♦ There exists no significance difference in problem solving ability of the adolescents on the basis of gender.

- ♦ There exists no significance difference in interest in science of the adolescents on the basis of gender.
- ♦ There exists no significance correlation between problem solving ability and interest in science of the adolescents.

DESIGN AND PROCEDURE OF THE STUDY

The present study was primarily designed to determine the relationship between problem solving ability and interest in science of the adolescents. The study has been conducted by involving descriptive survey method of research. Correlation technique was employed to determine the relationship between problem solving ability and interest in science of the adolescents. The present study was limited to only two variables i.e. problem solving ability and interest in science. The Problem solving ability was dependent variable whereas interest in science was the independent variable. The study was conducted on the sample of 175 students of government schools of Chandigarh only in the year 2016. The tools used for the present study were: Problem solving ability by Dubey (2010) and Interest in science developed and standardized by Dubey and Dubey (2002). The tests were administered according to the instructions given in their respective manuals.

ANALYSIS AND INTERPRETATION OF THE RESULTS

The data collected was analyzed by employing descriptive and inferential statistics and the results were interpreted.

Table 1: Mean, median and S.D. of problem solving ability and interest in science of the students

Variable	N	Mean	Median	S.D.	Skewness	Kurtosis
Problem solving ability	175	10.39	10.0	2.47	0.012	-0.07
Interest in science	175	44.18	44.0	9.81	-0.164	-0.89

Table 1 shows the mean, median, standard deviation, skewness and kurtosis of problem solving ability and interest in science of the students of government schools of Chandigarh. Mean of problem solving

ability of the students comes 10.39; median is 10 with Standard Deviation 2.47 and a Skewness of 0.012 and Kurtosis -0.07. Mean of interest in science of the students comes 44.18 median is 44 with Standard Deviation 9.81 and a Skewness of -0.164 and Kurtosis -0.89.

Table 2: Mean and S.D. of problem solving ability boys and girls

Variable	Gender	N	Mean	S.D.	t-Value	Remarks
Problem Solving Ability	Boys	87	10.10	2.36	1.54	Not significant at 0.05 level as well as at 0.01 level
	Girls	88	10.67	2.57		

Table 2 show the mean and standard deviation of Problem Solving Ability of boys and girls of class IX. It indicates that girls have better mean score of Problem Solving Ability as compare with boys. This is also depicted in the fig.1 below.

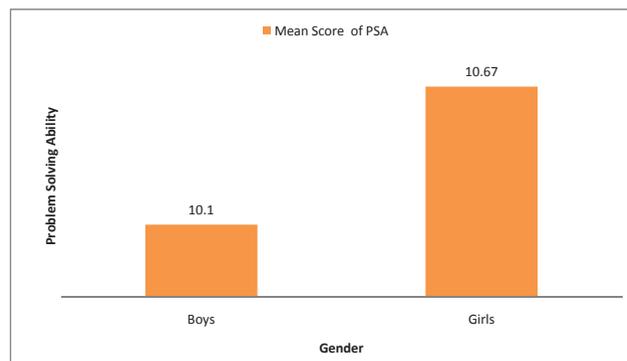


Fig. 1: Mean Scores of Problem Solving Ability of the Boys and Girls

From the table 2, it is also evident that the calculated t-value of 1.54 is less than the table value of 1.98 at 0.05 level of significance and is also less than table value of 2.63 at 0.01 level of significance. Hence, the null hypothesis, “there is no significant difference in problem solving ability of the adolescent on the basis of gender” is retained. The results indicate that the difference of 0.57 in problem solving ability of girls and boys is not significant even at 0.05 level of significance.

Table 3 show the mean and standard deviation of Interest in Science of boys and girls of class IX. It indicates that girls have better mean score of Interest in Science as compared to boys.

Table 3: Mean and S.D. of Interest in Science of Boys and Girls

Variable	Gender	N	Mean	S.D.	t-Value	Remarks
Interest in Science	Boys	87	40.99	9.84	4.51	Significant at 0.01 level of significance
	Girls	88	47.34	8.75		

This is also depicted in the fig. 2 below.

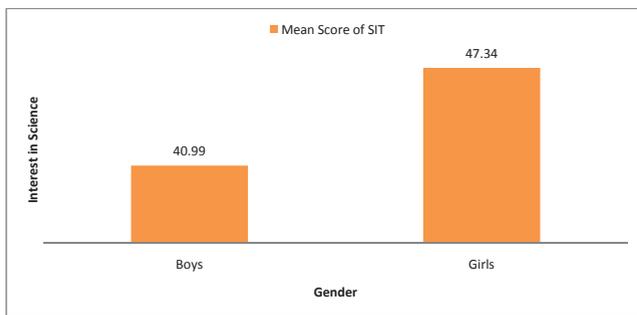


Fig. 2: Mean Scores of Interest in Science of the Boys and Girls

From the table 3, it is also evident that the calculated t-value of 4.51 is more than the table value of 1.96 at 0.05 level of significance and is also greater than table value of 2.58 at 0.01 level of significance. Hence the null hypothesis, “there is no significant difference in interest in science of the adolescent on the basis of gender” is rejected. Therefore there is significant difference in the interest in science of the adolescent on the basis of gender.

Table 4: Relationship between Problem Solving Ability and Interest in Science

Variables	df = N-2	r-value	Level of Significance
Problem Solving Ability	173	0.494	Significant at 0.01 level of significance
Interest in Science			

Table 4 show the relationship between the problem solving ability and interest in science of the adolescents. The coefficient of correlation between the problem solving ability and interest in science of the adolescents was found to be 0.494 which was found significant at 0.01 level of significance. Hence the null hypothesis, “there exists no significant correlation between problem solving ability and interest in science of the adolescent” is rejected.

Thus the results show that there exist significant correlation between problem solving ability and interest in science of the adolescent.

FINDINGS AND CONCLUSIONS

On the basis of study and interpretation of results following conclusions can be drawn. The study suggests that the difference in problem solving ability of girls and boys is not significant even at 0.05 level of significance. The results of study also indicate that the difference in interest in science of girls and boys is significant at 0.01 level of significance in favour of the girls. As far as relation between problem solving ability and interest is concerned the coefficient of correlation between the variables found to be 0.494 which is significant at 0.01 level of significance. The study has an educational implication in designing instruction for the scientific genius pupils to tap their potential and polish their intellect to groom them future scientist. This study could be particularly important for the science teacher to explore avenues to develop scientific attitude through recognition of the potential of pupils in problem solving and also by assessing their interest.

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