



A STUDY OF PROBLEM SOLVING ABILITY AND ACHIEVEMENT IN SCIENCE AMONG SECONDARY SCHOOL STUDENTS

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Abstract

The present study was conducted to examine the Problem solving ability and Achievement in science among secondary school students. Descriptive Survey method was adopted for the study. The data was collected using Problem solving ability test constructed by Dr. G. Sheela and Achievement test in science constructed by the researcher. Pearson Product moment correlation and t-test were the statistical techniques used for analysis of the data. The findings of the study highlights that there is no significant difference in problem solving ability in male and female secondary school students. A significant difference was found in achievement in science among male and female secondary school students. The findings show that the female students possess higher problem solving ability than the male students and the female students exhibit greater achievement in science than the male students. There is a moderate positive relationship between problem solving ability and achievement in science among secondary school students.

Keywords: Descriptive Survey method, Problem solving ability and Achievement in science



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Introduction

In the present world, the education is one of the most powerful agencies in moulding the character and decide the potential of individuals. Science Education being an important component of education system should contribute to the solution of the problem of the country by developing desirable understanding, skills, abilities and attitudes. Science education occupies a very important place in curriculum at school. Problem solving ability is one of the goals of science education. Problem solving ability and achievement of students are the important outcomes of science education.

NPE (1986), suggests that “Science Education Programmes should enable the learner to acquire problem solving and decision making skills and to discover the relation of Science with different aspects of life”.

Problem solving ability

Problem solving is the process used to solve a problem. Problem solving is a mental process and is part of the larger problem process that includes problem finding and problem shaping. Problem solving is defined as the ability of an individual to solve a problem by using his/her Knowledge and experiences.

“Problem Solving is the framework or pattern within which creative thinking and reasoning takes place.” (B.F. Skinner). In problem solving, the learner is placed in a problem situation where they recall previously acquired rules in the attempt to find a solution. In other words, Problem solving is the ability to think and reason on given levels of complexity. People who have learned effective Problem Solving techniques are able to solve problems at higher levels of complexity than more intelligent people who have no such training. “Problem Solving is a form of learning in which the appropriate response must be discovered.” (Gates and others).

Achievement in Science

Achievement refers to the level of success and of proficiency attained in some specific area concerning academic work. The achievement of the child depends upon the main factors namely upon the child's interest, motivation, adjustment and reading interest. Achievement in science refers to the performance of students in science that can be measured in terms of scores of the Achievement Test in science.

Need and Importance of the Study

The progress and prosperity of any nation is determined by its standards in science and technology, which is an outcome of the science education. Problem solving is an important component of science education. Problem solving makes learning interesting, live and hence learning will have higher retention power. 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. School is a place where students gain knowledge, get environment to develop their mental abilities, to learn Problem Solving techniques, strategies and skills to cope up with life. Problem solving abilities helps the students in logical reasoning and imaginative thinking. Those people who have knowledge of effective Problem Solving strategies are able to resolve difficulties at complex stage of Problem more than talented people who do not have such preparation. So, the present study is conducted to a study Problem Solving Ability and achievement in science among secondary school students.

Statement of the Problem

“A Study of Problem solving Ability and Achievement in Science among Secondary School Students”.

Objectives of the study

The following are the objectives of the study:

1. To find the significant difference in male and female secondary school students with respect to Problem solving ability.
2. To find the significant difference in male and female secondary school students with respect to achievement in science.
3. To study the relationship between Problem solving ability and achievement in science among secondary school students.

Hypotheses of the Study

The following hypotheses were formulated:

1. There is no significant difference in male and female secondary school students with respect to their Problem solving ability.
2. There is no significant difference in male and female secondary school students with respect to their achievement in science.
3. There is no relationship between Problem solving ability and achievement in science among secondary school students.

Variables of the study

Main variables:

- Problem solving ability
- Achievement in science.

Background variable:

- Gender

Method

Descriptive Survey Method was used for this study in order to study the Problem solving ability and Achievement in Science among Secondary School Students.

Sample of the study

120 secondary school students of Mysore district were selected as the sample of the study by using simple random sampling technique.

Tools used for the study

The following tools were used in this study:

- **Problem solving ability test :**

Problem solving ability Test was constructed by Dr. G.Sheela. Problem solving ability Test.

- **Achievement test in science:**

Achievement test in science was constructed by the researcher. Achievement test in science consists of fifty two questions. These questions were selected from ninth standard NCERT science text book prescribed by the Government of Karnataka covering the concepts related to Force and Laws of Motion, Gravitation, Work and Energy, Sound, Matter in our surroundings and Natural resources.

Statistical techniques

T-test and Pearson Product moment correlation were used to analyse the data.

Analysis and Interpretation of data

Hypotheses 1: There is no significant difference in male and female secondary school students with respect to Problem solving ability.

Table 1: Showing the t-value of male and female secondary School students with respect to Problem solving ability .

Sl. No.	Group	N	Mean	SD	df	t value	Sig.
1.	Male	58	12.1034	2.35	118	1.328	NS*
2.	Female	62	12.6129	1.83191			

* Significant at 0.05 level

Table 1. shows that, obtained t-value 1.328 which is lesser than the tabled t-value at 0.05 level of significance. Therefore the null hypothesis 1 is accepted. Hence it is concluded that, there is no significant difference between male and female secondary school students in problem solving ability.

Hypotheses 2: There is no significant difference in male and female secondary school students with respect to achievement in science.

Table 2: Showing t-value of male and female secondary school students with respect to achievement in science.

Sl. No.	Group	N	Mean	SD	df	t - value	Sig.
1.	Male	58	29.2586	10.81513	118	2.800	S*
2.	Female	62	34.8548	11.05404			

* Significant at 0.05 level

Table 2 shows that, obtained t-value 2.800 which is greater than the tabled t-value at 0.05 level of significance. Therefore the null hypothesis 2 is rejected and the alternated hypothesis is accepted. Hence it is concluded that, there is significant difference between male and female secondary school students in achievement in science. Since the mean value of male students is found to be 29.2586 and that of female students is 34.8548 it is concluded that female students exhibit greater achievement in science than their male counterparts.

Hypotheses 3: There is no correlation between Problem solving ability and achievement in science among secondary school students.

Table 3: Showing the correlation between Problem solving ability and achievement in science among secondary school students.

Sl. No.	Variable	N	df	r
1	Problem solving ability	120	118	0.4
2	Achievement in science			

Table 3 shows that, obtained r- value which is 0.4 depicts a moderate positive correlation. Hence it is concluded that, there is moderate positive correlation between problem solving ability and achievement in science among secondary school students.

Findings of the study

- There is no significant difference in male and female secondary school students with respect to their Problem solving ability.
- The findings show that the female students exhibit greater achievement in science than the male students.
- There is a moderate positive relationship between Problem solving ability and achievement in science among secondary school students.

Educational Implications:

The findings of the study highlights that there is no significant difference in male and female secondary school students in Problem solving ability. There is a need for incorporating Problem solving ability in school education. All students irrespective of their gender should be trained from the early stages of their education. So curriculum planners should plan to employ more strategies for the development of problem solving ability in students.

The findings of the study highlights that the female students exhibit greater achievement in science than the male students with respect to their achievement in science. Conducting talent tests in science in schools and giving rewards to the best achievers may increase the achievement in science.

The findings of the study highlights that there is a low positive relationship between Problem solving ability and achievement in science among secondary school students may help the science educators for making necessary curriculum decision and in guiding the pupils in proper lines, proper steps can be taken to promote them. The curriculum could be reconstructed from examination centric practices to experience based learning. Brainstorming as an activity needs to be incorporated especially in solving problems. Teachers should be oriented on the importance of Problem solving to enhance students' performance. Seminars, workshops and orientation programmes should be organised to install the application of problem solving techniques. Science education should prepare individuals to utilize science for improving their own lives and for coping with an increasingly technological world. This is possible only when learners are allowed to think critically, reflect and analyse their own learning process. Then, students will be able to solve problems effectively and thus can ensure maximized learning.

Conclusion

Problem solving in science learning has become a major subject in the investigation. Problem-solving activities help students to construct new knowledge and facilitate science learning. Problem solving ability has a significant role in the academic achievement, since the subject is dependent mostly on the logical reasoning ability of students. The achievement of the student depends upon his conceptual learning and understanding of the topic.

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