



## A STUDY ON THE RELATIONSHIP OF PROBLEM SOLVING ABILITY AND ACADEMIC ACHIEVEMENT OF HIGHER SECONDARY STUDENTS

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### ABSTRACT

*The present study has been undertaken to study the relationship of problem solving ability and academic achievement of higher secondary level students. The sample consisted of 100 students studying in class XI of different higher secondary school of Jabalpur. The collected data has been studied and subjected to statistical analysis. The result of the study revealed that relationship between problem solving ability and academic achievement is highly positive. This study also reveals that problem solving ability affects academic achievement of the higher secondary level students.*

**KEYWORDS** : academic achievement, problem solving ability.

**Problem solving ability** is an essential exercise for individual advancement and the advancement of society. A child is not born with these abilities, but has to develop these abilities through course of his lifetime with the help of his parents, teachers and society at large. Therefore it is very important for the parents and teachers to understand the psychology of problem solving. The meaning and nature of problem solving is further clarified by the following definitions. According to **WOODWORTH AND MARQUIS** (1948), "Problem solving occurs when there is an obstruction of some sort in the attainment of an objective. If the path towards the goal is straight and open then there is no problem." According to **SKINNER** (1968), "Problem solving is the frame work or pattern within which creative thinking and reasoning takes place." According to **RISK**, "Problem solving may be defined as a process of raising a problem in the minds of students in such a way as to stimulate purposeful, reflective thinking for arriving at a rational solution. According to **S.Ian Robertson**- "Problem solving is a mental process which is the concluding part of the larger problem process that includes problem finding and problem shaping where problem is defined as a state of desire for the reaching of a definite goal from a present condition that either is not directly moving toward the goal, is far from it or needs more complex logic for finding a missing description of conditions or steps toward the goal". Problem solving ability is highly correlated with intelligence, reasoning ability and mathematical ability. It is the ability to think and reason on given level of complexity. Problem solving in mathematics is a fruitful exercise for the development of one's mental faculties as the process of problem solving involves the scientific method of thinking and reasoning. A thorough understanding of mathematical concepts is essential for solving problems in mathematics. A student having good problem solving ability, will be properly adjust in the class as well as at home.

Academic Achievement means knowledge, understanding or skill acquired after instructions and training in courses or subjects of study. It is generally measured by means of total marks of the students obtained by them in a particular class. Academic achievement depends upon different factors which directly or indirectly influence it. In the past a strange notion

possessed in the minds of a great as well as common people was that academic achievement is only dependent upon intelligence. But with the exploration of new knowledge, it has been noticed that there are other factors, which are as important as intelligence. Achievement is commonly applied to performance in educational test rather than psychological test i.e. it implies demonstration of required ability, skill, knowledge or understanding than inherent capacity. As per Webster's New World Dictionary (1976) "Achievement means achieving a desired result especially by skill, work etc.

Ganandevan (2006) found out that the problem solving ability of higher secondary students is low. The male and female students and the students residing at rural and urban area differ significantly in their problem solving ability. Lee et al. (2004) found significant differences between gifted students and regular students on their mathematical problem solving ability. Hoovinabhavi et al. (2004) studied on problem solving ability of college students and found that the girls of both science and arts faculty are better in their problem solving ability. Sanjaikandhi (2005) during the M.Ed. dissertation identified that the problem solving ability of the higher secondary students is low. Pandey and Manjula (2012) found the problem solving ability of matriculation students is low. The male and female students and the students residing at rural and urban area differ significantly in their problem solving ability. Sharma (2007) studied on problem solving ability and scientific attitude as determinant of academic achievement of higher secondary students and found out higher secondary students have shown average problem solving ability. Bandhana and Darshana (2012) found that emotional intelligence and home environments have significant impact on the problem solving ability of adolescents.

### Need of the study:

Problem solving is one of the five fundamental mathematical process standards along with reasoning and proof, communication, connections, and representation. It is the foundation of all mathematical activity. In order to function in our complex and changing society, people need to be able to solve a wide variety of problems. Problem solving is a process; it requires great precision, accuracy, speed and thorough knowledge in mathematical concepts and skills.

### Objectives of the study:

1. To study the levels of problem solving ability of the students of higher secondary level.
2. To study the relationships between problem solving ability and academic achievement of students of higher secondary levels.

### Hypotheses of the study;

1. Problem solving ability of the students of higher secondary level is high.
2. There is no significant relation between problem solving ability and academic achievement of students of higher secondary levels.

### Research methodology:

Descriptive survey method was used to conduct the study. The sample consisted of 80 students of eleventh class studying in higher secondary school of Jabalpur.

### Research tool and statistical technique used:

L.N. Dubey's problem solving ability test was used to study the

problem solving ability of students. This test is in Hindi language and contains 20 unsolved questions. Every question has four correct responses out of which only one answer is correct. If the student ticks the correct answer then he/she given one mark and if he/she ticks a wrong answer, zero mark is given. At the end, the marks were added. The maximum mark of the test is 20. The marks of X Class Board Examination treated as academic achievement score of students. The Higher Secondary students were divided into two categories of achievement on the basis of Q1 and Q3. The scores of problem solving ability analyzed at two level of achievement (HA and LA). The Mean and Standard Deviation (S.D) were carried out to study the general nature of sample in relation to Academic Achievement and Problem Solving Ability.

Pearson's co-efficient of correlation was calculated for finding out relationship of academic achievement with problem solving ability.

**Result and discussion:**

**Table-01: Combined Mean Values of problem solving ability of students of higher secondary level at different level of achievement with N=14 in each cell**

|                      | HA    | LA   | Combined Mean |
|----------------------|-------|------|---------------|
| <b>Boys</b>          | 14.13 | 9.14 | 11.63         |
| <b>Girls</b>         | 11.60 | 7.53 | 9.56          |
| <b>Combined Mean</b> | 12.86 | 8.33 | 10.59         |

Table 01 shows that mean values of problem solving ability among students from High achiever and Low achiever group are 12.86 and 8.33 respectively. It can be thus said that the students with high academic achievement have higher level of problem solving ability than the students with low academic achievement. Their mean values of problem solving ability being 12.86 and 8.33 respectively. Therefore our hypothesis 01 is rejected. Therefore the hypothesis that the students with high problem solving ability will differ significant in their academic achievement compare to those from low problem solving ability is accepted. Problem solving ability of students of higher secondary level is not high but average which is 10.59.

**Table 02: Relationship between Problem Solving Ability and Academic Achievement**

| Variable  | Coefficient of correlation = r | N   | Significant level         |
|---|--------------------------------|-----|---------------------------|
| <b>Academic achievement x problem solving ability</b> | 0.727                          | 100 | Significant at 0.01 level |

Table 02 shows relationship between academic achievement and problem solving ability.

Karl Pearson's product moment coefficient of correlation ( $r=0.727$ ) is computed in order to ascertain the relationship of academic achievement towards problem solving ability. It means the students having higher level of problem solving ability are likely to have better academic achievement score. So it can be concluded that there is a marked or substantial correlation, between academic achievement and problem solving ability. The result of the table reveals that there is positive and significant relationship between academic achievement and problem solving ability. Therefore the hypotheses 2 i.e. there will be no significant relationship between academic achievement and problem solving ability is rejected.

**Conclusion:**

Level of problem solving ability of higher secondary school students is average. Problem solving ability is highly correlated with academic achievement, intelligence, creativity, reasoning ability, numerical ability and mathematical ability. Therefore, it is necessary that we should develop the problem solving ability through proper education and training of our young boys and girls. Computer programming enhances problem-solving abilities and promotes creativity and reasoning ability of students. The present school science curriculum is able to develop only average level of problem

solving ability among higher secondary students and a positive relationship exists among Achievement and problem solving ability.

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