

A STUDY OF PROBLEM SOLVING ABILITY IN RELATION TO ACADEMIC ACHIEVEMENT OF PUPIL TEACHERS

Voice of Research
 Volume 4 Issue 2
 September 2015
 ISSN No. 2277-7733

Nirupama Pathak

Hitkarini Prashikshan Mahila Mahavidyalaya, Jabalpur

Abstract

The present investigation focuses on the study of problem solving ability and academic achievement of pupil teachers' students. A survey was conducted to find out the relationship between problem solving and academic achievement of the pupil teachers of Jabalpur, Madhya Pradesh. Normative survey method used to collect data. The girls' students studying in B.Ed. colleges constituted the population of this study. The pupil teacher students of H.P.M.M. Jabalpur, M.P. were selected as a sample for this study. The collected data has been studied and subjected to statistical analysis. The result reveals that relationship between problem solving ability and academic achievement is highly positive. There was significant difference was found between science and arts pupil teachers, no significant difference was found between arts- commerce, and science -commerce pupil teachers.

Key words : *problem solving ability, academic achievement, achievement, pupil teachers.*

Problem solving ability

The productive work involved in the evaluation of the situation and the strategy worked out to reach one's set goals is collectively termed as problem solving. This 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 life time 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 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 corequisite to develop problem solving. Problem solving ability helps in solving the problem constructively. This skill assists in resolving a con-



flict, reaching a solution and settles an issue. It develops the ability to get out of difficult situation and achieve the goal without using anger, coercion, defiance and aggressive behaviour. Problem solving is a process that provides an opportunity for a positive act. It enables a student to solve the problem by adopting creative and critical thinking.

Objective of the study

- To study the academic achievement of previous class.
- To study the problem solving ability in relation to academic achievement.
- To study the problem solving ability between science and commerce pupil teachers.
- To study the problem solving ability between arts and commerce pupil teachers.
- To study the problem solving ability between science and arts pupil teachers.

Hypothesis of the study

There may be positive relationship between the problem solving ability and academic achievement of pupil teachers. The student (pupil teachers) with high academic achievement will differ significantly in problem solving ability as compared to those with low academic achievement. There exist significant differences in problem solving ability between science-arts pupil teachers. there exist significant difference in problem solving between science- commerce students. there exist significant difference in problem solving ability between arts-commerce students (i.e. pupil teacher)

Sample : Fifty pupil teachers out of one hundred pupil teachers of B.Ed. first semester studying in Hitkarini B.Ed. College, Jabalpur were selected randomly. Out of them 24were science, 15 were commerce and 11were arts pupil teachers.

Table 02 : Analysis of Academic Achievement of pupil teachers with high and low Problem Solving Ability
Degree of freedom=28 level of significance at 0.05=2.048

Group	No. Of Students	Mean	S.D.	M.D.	Standard Error	t-value	Sign. level
High level PSA	15	14.13	1.19	6.60	0.387	17.052	P<0.0001
Low level PSA	15	7.53	0.92				

Level of significance at 0.001=3.674

The table 02 shows the mean and standard deviation of higher group i.e. pupil teachers with higher academic achievement score and lower group i.e. pupil teachers with lower academic achievement score. The mean score of higher group is found to be 14.13 and standard deviation as 1.19 and mean score of lower group is found to be 7.53 and standard deviation as 0.92. To test the difference between the two means, t-value is calculated which is found to be 17.052. Table value of t at 28 degree of freedom (d f) at 0.05 levels is 2.048 and at 0.01 level of significance is 2.763. Hence calculated value (t=17.052) ex-

Research tool and statistical technique used

L.N. Dubey's problem solving ability test was used to study the problem solving ability of students. 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. t-test was used to find out the difference between science-commerce, arts- commerce, and science-arts pupil teachers.

Table 01 : Relationship between Problem Solving Ability and Academic Achievement

No.	Variable	Coefficient of correlation = r	N	Significant level
1.	Achievement x problem solving ability	0.727	50	Significant at 0.01 level

Table 01 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 i.e. there will be positive relationship between academic achievement and problem solving ability is accepted.

ceeds the t values at given degree of freedom. Hence it is interpreted that there will be extremely significant difference between the high achievement score and low achievement score of pupil teachers in respect to problem solving ability. The students with high academic achievement have high problem solving ability than the students with low academic achievement. Therefore the hypothesis that the student (pupil teachers) with high academic achievement will differ significantly in problem solving ability as compared to those with low academic achievement is accepted.

Table 03 : Mean, standard deviation and t-values of pupil teachers in their problem solving ability score

Variable(pupil teacher)	Mean score	N	S.D.	Degree of freedom	t-ratio	Level of significance	p-value
Science	11.63	24	2.83	33	2.471	0.05	<0.05
Arts	9.14	11	2.50				
Science	11.63	24	2.83	37	1.66	NS	>0.05
Commerce	10.13	15	2.59				
Arts	9.14	11	2.50	24	0.979	NS	>0.05
Commerce	10.13	15	2.59				

Degree of freedom=33 level of significance at 0.05= 2.021

The table shows that value of t-ratio for subject group combination Of science and arts is 2.471. This value is significant a 0.05 level of significance. It means that there is significant difference exists between the problem solving ability of science and arts pupil teachers. Therefore science pupil teacher have higher level of problem solving ability as compared to arts pupil teachers. Thus hypothesis 3is accepted. To test the difference between the two means of subject group combination of science-commerce and arts commerce, t-value is calculated. The calculated t-value for science-commerce group at 37 d f is found to be 1.66. Table value of t at 37 degree of freedom (d f) at 0.05 levels is 2.021, which is insignificant at 0.05 level.

As regard subject group combination of arts- commerce, the calculated t-values is 0.979,table value of t at 24 d f is 2.064, which is, insignificant at 0.05 levels and it is concluded that there is no significant difference found in the mean score of problem solving ability of arts-commerce and science-commerce pupil teachers. Thus hypotheses 4and 5 are rejected.

Conclusion : 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 result indicates that science pupil teachers have higher level of problem solving ability as compared to arts pupil teachers. This may be due to high level of problem solving, decision making, coping with stress, critical and creative thinking abilities. Such abilities should also be developed among arts students (pupil teachers) also. 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.

Suggestions : The study can be done for the extended population with taking the other background variables like locality of colleges, parental qualification, medium of instruction, gender differences etc.

References

Aggarwal, Y.P. (1986) " Statistical Methods-Concepts, Applications and Computation" New Delhi, Sterling Publishers Pvt. Ltd.
Ayodhya, p.(2007) Blending Problem Solving Skills to Learner Achievement. Edu. Tracks, Vol. 7 (1), 34-38.
Bandhana and Sharma D. (2012) Emotional Intelligence, Home Environment and Problem Solving Ability of Adolescents : Indian Streams Research Journal, 1(V), 1-4.
Baskaran, K. (1991) Achievement-motivation Attitude towards Problem Solving and Achievement in Mathematics of standard X students in Devakottai District. Fifth Survey of Educational Research (1988-92), Vol. 2,1863.

Darchingpui(1989) A study of Science Achievement, Science Attitude and Problem Solving Ability Among Secondary School Students in Aizawal. Fifth Survey of Educational Research (1988-92), Vol. 2, 1239-1240.
Dillon, J. T. (1982), Problem Finding and Solving. The Journal of Creative Behavior, 16, 97-111. | o
Dillon, J. T.(1988). Levels of problem findings vs. problem solving, Questioning Exchange, 2(2), 105-115. |
Dutt, Sunil (1989) Problem Solving Ability in Science in relation to the Anxiety, cognitive Style and Intelligence of High School Students. Indian Education Review, Vol.28, 168-170.
Garrett, H.E. (1958) "Statistics in Psychology and Education" Bombay, Allied Pacific Private Ltd.
Good C.V. (1963) "Introduction to Education Research : Methodology of Design in Behavioural and Social Science" New York, Appleton-Century Crafts.
Guilford, J.P. (1966) "Fundamental Statistics in Psychology and Education" New York, Mc Graw Hill Kogakusha Ltd.
Garrett, H. Garrett, H.E. (1958) "Statistics in Psychology and Education" Bombay, Allied Pacific Private Ltd.
Good C.V. (1963) "Introduction to Education Research : Methodology of Design in Behavioural and Social Science" New York, Appleton-Century Crafts.
Guilford, J.P. (1966) "Fundamental Statistics in Psychology and Education" New York, Mc Graw Hill Kogakusha Ltd.
Garrett, H.E. (2005) Statistics in Psychology and Education, New Delhi, Paragon International Publishers.
Krishan, J. Navaneetha (1990) Identification of Problem Solving Strategies in Mathematics among High School Students in Devakottai Education District. Fifth Survey of Educational Research (1988-92), Vol. 2, 1283-1284.
Kumari, Vijaya (1991) Problem Solving Strategies and Cognitive Capabilities of Children of Age-Group 10-12. Indian Education Review, Vol, 24-27.
Nataraj P.N. and Manjula M. (2012). A study of problem solving ability among the matriculation school students. International Journal of Teacher Educational Research levels of Intelligence. Indian Educational Review, Vol. 1, 38-40.
Sharma, Indira (2007) Problem Solving Ability and Scientific Attitude as Determinant of academic achievement of Higher Secondary Students. Journal of All Indian association for Education Research, Vol. 19 (1, 2) 68-69.
Singh, Radha Charan (1992) A Comparative Study of Scientific Creativity, Problem Solving and Risk Taking in Tribal and Urban Students. Fifth Survey of Educational Research (1988-92), Vol. 2, 1074.
Sumalatha, K and Reddy, V.G. (2003) Academic achievement of Senior Intermediate Students in relation to certain Factors. The Educational Review, Vol. 46 (2), 32-34.
Thind, S.K. (1990) Effect of Parental Educational and Occupational on the Mathematical Problem Solving Ability of Students of Grades VII or IX. Fifth Survey of Educational Research (1988-92), Vol. 2, 1297-98.o.