THE ROLE OF PROBLEM SOLVING ABILITYAND ITS RELATIVE FACTORS AMONG MATHEMATICS STUDENTS

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Abstract: This study examines to determineThe role of problem solving ability and its relative factors among mathematics students. 50 mathematics students studying in XI standard were chosen as the sample. Problem solving ability scale by (McMillan&Schumacher 2006), Decision making Questions by (Greene et al 1997) and Cognitive style (Kozhevnikov et al., 2005) were used to collect data. Results were statistically analyzed through Mean, Standard deviation, Correlation coefficient, Multiple Regression and Critical ratio. It has been concluded that relative factors and problem solving ability are significantly correlated among mathematics students.

Key words: Problem solving ability, Decision making and Cognitive style.

Introduction: In the present study problem-solving ability of higher secondary school students was taken to study. Usually, the nature of a problem is such that an answer or solution is needed. In such cases, problem-solving is used to understand important aspects of the problem so that an answer or solution can be found. Problem solving can be an amazing process, but it is up to you to make it that way instead of just something you do because you have to. You have the ability to become a great problem solver, but you have to begin looking at it as an art. The skills of decision-making and problem solving are not only the results of development and socialization, but also inevitable processes that go on throughout the life of an individual. Modern education systems aim to develop the competency to approach problems with responsibility and make the right decision about the solutions. A school, which is an institution of socialization, is the best place where the new generations can be taught the skills of problem solving and effective decision-making. Schvaneveldt and Adams (1983), this is a period of development, but it is a period with limited experiences in terms of cognitive processes of decision-making and problem solving skills.Decision making is an essential process of modern management representing in every field. The aim in making decisions is to evaluate the solutions that could be realized and to attain positive results by implementing them. Decision making is one of the most important activities in which school administrators engage daily.

Cognitive style or "thinking style" is a term used in cognitive psychology to describe the way individuals think, perceive and remember information. Cognitive style differs from cognitive ability (or level), the latter being measured by aptitude tests or so-called intelligence tests. There is controversy over the exact meaning of the term "cognitive style" and whether it is a single or multiple dimension of human personality. Cognitive style has received theoretical attention in the education, career, and management literatures (Kozhevnikov, 2007). Curry (1983) regards cognitive style as the individual's approach to adapting and assimilating information, which does not interact directly with the environment, but is an underlying and relatively permanent personality dimension that is observed across many learning instances.

II.Sample: A convenient random sampling technique was adapted for the selection of sample the school selected for this study namely boys aided school. Then random convenient sampling technique was adopted to select the sample. 50 mathematics students were taken for the study. The students studying in XI standard were chosen as the sample.

III. Statement of the problem: The Role of Problem Solving Ability and its relative factors among Mathematics Students were chosen for the study.

IV. Objectives of the Study: Gender plays a very important role on the Problem Solving Ability in Mathematics

1. To find out the significant relationship between Problem Solving Ability and Decision Making among higher secondary school students.
2. To find out the significant relationship between Problem Solving Ability and Cognitive style among higher secondary school students.
3. To find out the significant relationship between Decision Making and Cognitive style among higher secondary school students.

V. Hypothesis: There is no significant relationship between Problem Solving Ability and Decision Making from the total sample

1. There is no significant relationship between Problem Solving Ability and Cognitive style from the total sample
2. There is no significant relationship between Decision Making and cognitive style from the total sample

VI. Research Tools selected for the Present Study:

The following tools have been used by the investigator to carry out this study.
Problem solving ability scale by (McMillan&Schumacher 2006).
Decision making Questions by (Greene et al 1997).
Cognitive style (Kozhevnikov et al., 2005).

Hypothesis-1 | Table-1.

Correlation of problem solving ability with decision making

Variable	Gender	N	Correlation	t test	L.S
Problem solving ability with Decision Making	**Boys**	**50**	**0.708**	**6.95**	**0.001**

From the table 1 and also from the figure A it is understood that the calculated correlation coefficient values are significantly greater than that the table correlation coefficient values. Hence the hypothesis is rejected and proved that there is significant relationship between problem solving ability with Decision Making in the total sample.

Hypothesis-2 | Table-2

Correlation of problem solving ability with cognitive style

Variable	Gender	N	Correlation	t test	L.S
Problem solving ability with Cognitive style	**Boys**	**50**	**0.755**	**7.97**	**0.001**

From the table 2 and also from the figure A it is understood that the calculated correlation coefficient values are significantly greater than that the table correlation coefficient values. Hence the hypothesis is rejected and proved that there is significant relationship between problem solving ability with Cognitive style in the total sample.

Hypothesis-3 | Table-3

Correlation of decision making with cognitive style

Variable	Gender	N	Correlation	t test	L.S
Decision Making with Cognitive Style	**Boys**	**50**	**0.684**	**6.49**	**0.001**

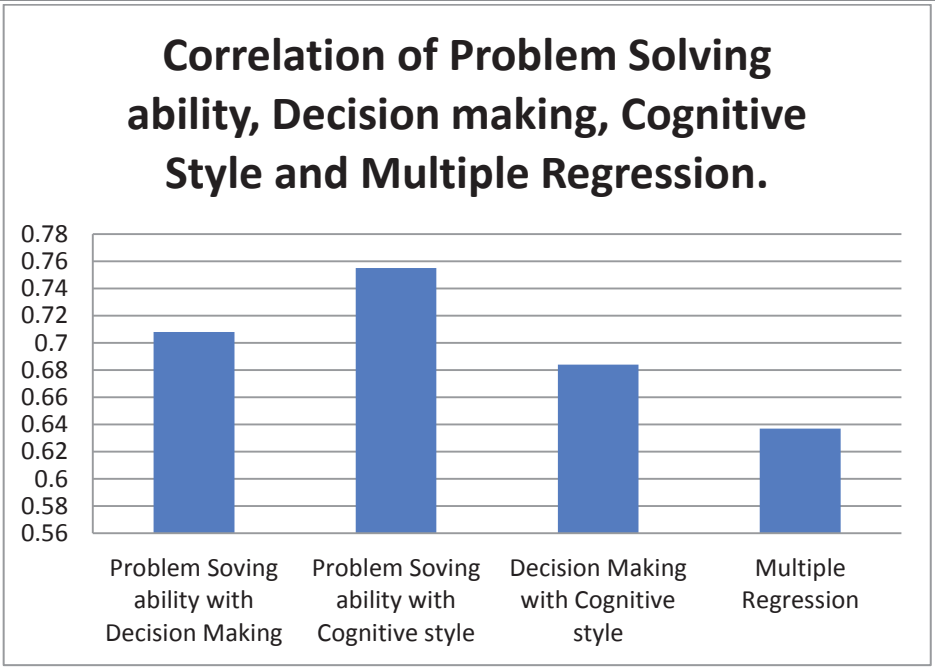
From the table 3 and also from figure A it is understood that the calculated correlation coefficient values are significantly greater than that the table correlation coefficient values. Hence the hypothesis is rejected and proved that there is significant relationship between Decision Making with Cognitive Style in the total sample.

Multiple Regression Analysis | Table 4

Multiple Regression Analysis of Problem solving Ability, Decision Making and Cognitive Style

Variable	Gender	N	Multiple Regression Analysis	LS
Problem solving Ability, Decision Making and Cognitive Style	**Boys**	**50**	**0.637**	**0.001**

From the table 4 and also from figure A it is understood that the Multiple Regression Analysis values are significantly greater than that the table Regression values. Hence the hypothesis is rejected and proved that there is significant relationship between Problem Solving Ability, Decision Making and Cognitive Style in the total sample.



VII. Delimitations of the Study:

* The study was restricted to Higher Secondary School Students.
* A Sample size was 50 Higher Secondary School Students

VIII. Evidence and Discussion:

Present investigation is supported by the following studies:

A significant difference was observed between male and female adolescents. In terms of decisional self-esteem and stress, it was observed that male adolescents had more self-esteem and that they experienced less stress in decision making than female adolescents. Female adolescents are less self-esteemed in decision-making and they feel more stressful. This finding confirms that O'Hare and Beutells (1987).significant difference exist between male and female teachers on self- Self-Esteem and Decision Making Styles esteem (t= 2.30) which is significant at 0.05 level. This result is consistent with the findings of Leon Mann, et al (1989) and Cheryl Armond, et al (1991). None of the cognitive styles scores had a significant main effect on the mean time spent processing TITAN targets. However, as expected, there was a tendency for higher PFI scores to predict a longer mean decision time.It was revealed that revealed that problem solving ability was significantly predictive of study behavior of the secondary school students. The observed F ratio was significant at the 0.5 level. This is an indication that a combination of the independent variables (Problem solving ability subscales) were effective in predicting study behavior of the students and that it could not have occurred by chance.(Samuel O.Salami and A. OyesojiAremu. – drsosalami 2002).The problem solving ability was found to be significantly predictive of study behavior corroborates the findings of Elliot , God shall, Shrout and Witty (1990) Who had similar results with academically at-risk college students. It was suggested that problem solving ability involves more than social skills and inter personal competence contrary to the assertion of D'Zurilla and Nezu (1987). One could infer that effective problem solvers in previous study were more aware of and recognized more effective study behaviours than ineffective problem solvers. It was very likely as suggested by Elliot et al (1990) that, effective problem solvers endorsed behaviours important for functioning successfully in academic environment. This finding is also in support of the work of Heppner and Kraus Kopf (1987) who theorized that effective problem solvers process and generate more adaptive, goal directed solutions to problems encountered in their environment then ineffective problem solvers.

IX. Educational Implication: It is generally accepted that at least three elements are required for problem solving and decision making: a knowledge base, an adequate level of thinking and communication skills, and an organized approach or strategy to solve problems (Woods, 1987).

X.Summary and Conclusion: Problem solving in mathematics can be described as "thinking and working mathematically" but the converse is not true. Problem solving in mathematics is a complex process which requires an individual who is engaged in a mathematical task to coordinate and manage domain-specific and domain-general pieces of knowledge.Successful and unsuccessful problem solvers in mathematics differ with regard to knowledge, control and beliefs and affect factors. The

review of the research literature on factors that contribute to students' in mathematical problem solving suggests that: 1. the mathematics content level of the problems which students at different year levels of schooling will be able to solve successfully, and 2. the different strategies or heuristics which students at different year levels use to solve the same mathematical problems must govern the design of problem-solving curricula at the various year levels of schooling.

In general, there is a need to develop and use a problem-solving/decision-making process that is both scientific and considerate of individual differences and viewpoints. While the scientific process has provided a method used successfully in a wide variety of situations, researchers have described individual differences that can influence perspectives and goals related to problem solving. These differences can be used to identify appropriate problem-solving techniques used in each step of the problem-solving process.

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