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PROBLEM SOLVING ABILITY OF ADOLESCENTS WITH RESPECT TO THE LOCUS OF CONTROL, GENDER, AND LOCALITY

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ABSTRACT

The present study focuses on looking at the influence of locus of control, gender, and locality on problem solving ability of adolescents (50 males, 50 females) of the age group of 13- 15 years. The tools used in the study are problem solving ability test (PSAT) by L.N. Dubey and Locus of Control scale (LCS) by Dr. N. Hasnain and Dr. D. D. Joshi. With 2x2x2 factorial design, the study resulted that there exist no significant difference in internally controlled males and internally controlled females, externally controlled males and externally controlled females, urban males and rural males, urban females and rural females. There is significant positive relation between problem solving ability and locus of control. Internally controlled students had higher problem solving ability than externally controlled students, whereas no significant difference is found in males and females, and urban and rural adolescents on problem solving ability scores.

KEYWORDS: Adolescents, Gender, Locality, Locus of Control, Problem Solving Ability.

INTRODUCTION

Problems are the central part of human life and each human being is jiggling with the process of problem solving. Problems, of course, perennially confront human existence at scales from common challenges to the great dilemmas of nation and the world. Human institutions, including nations and empires have disappeared because their members did not understand the development of problem solving (Tainter, 2000). “Problem solving ability, being a complicated but highly structural progress of mental activities in human beings is a main target in developed countries” (Dissertation Abstract International, 1996). Problem solving is one of the five fundamental mathematical processes identified by the National Council of Teachers of Mathematics (NCTM, 2000), a key objective of many US states’ curricula, in many European nations, problem solving and its related skills form key expectation of the intended curriculum for students of all ages, the Singaporean authorities have placed problem solving at the centre of mathematics as a school subject, many educational systems, through the medium of the intended curriculum have highlighted problem solving and associated skills, as important outcomes of learning process

(Xenofontons, Andrews, 2012). The need for learners to become successful problem solvers has become a dominant theme in many national standards (AAAS, 1993; NCSS, 1997; NCTE, 1996, NCTM, 1989, 1991). Problem solving ability evolves the scientific and heuristic approaches in children which further add to development of scientific attitude which is essential to dispel social evils and helps in development of open-mindedness, decision taking ability, quality thinking and much more to add on. The present school curriculum is able to develop only average level of scientific attitude and problem solving ability among higher secondary students (Sharma, 2007). The effective problem solvers process and generate more adaptive, goal- oriented solutions to problems encountered in their environment than ineffective problem solvers (Heppner & Kraus, 1987).

There are many a people around us we see that every action done by them is surrounded to some incongruent, may be almighty or super natural power; known as having external locus of control and others are there who own the responsibilities of their actions; known as holding internal locus of control in literature of psychology. The participants perceiving themselves as effective problem solvers tend to have more internal locus of control, use more problem focused coping strategy (Comas, Malcarne, & Fondacaro, 1988; Ebata & Moos, 1991), have fewer irrational thoughts, and have more confidence in their decision making ability than ineffective problem solvers (Elliott, Godshall, Shrout, & Witty, 1990; Priester &Clum 1993).

On reviewing the available literature, a mixed trend is noticed regarding the problem solving ability of males and females. The researches (Darchingpui,1989; Hoffman & Maier, 1966; Norman & Ronald, 1965) stated significant difference in problem solving ability of males and females. On the other hand, researches (Sharma, 2007; Jacks, 2006) concluded no significant differences in problem solving ability of males and females.

The literature in Indian context reveals that difference in the locality of students, that is, the students living in urban or rural area differ in their problem solving ability scores. Nagalakshmi, R.S. (1996) constructed a problem solving ability test in mathematics for secondary students and studied the problem solving ability of students of x class in twin cities of Hyderabad and found that urban students facilitated in problem solving ability scores. Singh, Radha Charan (1992) ascertained urban students were superior in all levels of Green's classification to problem solving ability, girls were superior to boys in problem solving ability and there is significant relationship between scientific creativity and problem solving ability.

Objectives of the study

The investigator set the following objectives to work on

O_1 To identify the problem solving ability of students at adolescent stage,

O_2 To study the influence of locus of control on problem solving ability at adolescent stage,

O_3 To study the influence of gender on problem solving ability at adolescent stage,

O_4 To ascertain the influence of locality on problem solving ability at adolescent stage,

O_5 To ascertain the relationship between problem solving ability and locus of control at adolescent stage,

O_6 To compare internally controlled males and internally controlled females on problem solving ability at adolescent stage,

O_7 To examine the externally controlled males and externally controlled females on problem solving ability at adolescent stage,

O_8 To explore urban males and rural males on problem solving ability at adolescent stage, and

O_9 To explore urban females and rural females on problem solving ability at adolescent stage.

Methodology of research

A descriptive survey study and a 2 x 2 x2 factorial design has been used for the processing of present stated study.

Sample

Through random sampling technique, 100 adolescents of 10^{th} class, ranging from 13-15 years (urban = 50, rural = 50) from a city of Haryana have been chosen.

Tools applied in research work

In the present study the following tools have been chosen for the collection of data:

- Problem Solving Ability Test (PSAT), developed by L.N. Dubey (1971).
- Locus of Control Scale (LCS), developed by Dr. N. Hasnain and Dr. D.D. Joshi (1992)

Both the used tools are free from much demanding efforts and are tried to make simple as much possible as one could. Problem Solving Ability Test (PSAT) is constructed by L.N. Dubey (1971), is published by National Psychological Corporation (Agra) and is in Hindi version. Reliability of test calculated by Spearman Brown Formula (split half method) is 0.782 and Kundar Richardson formula (rational equivalence method) is 0.768. Co-efficient of validity, calculated by correlating the scores of tests group intelligence test (R.K. Tandon) is 0.682 and Test of reasoning ability is 0.852. The test is designed for the age group of 12-17

years for both boys and girls, belonging to all socio-economic status and varied intelligence. There are 20 items in the test. Each problem has four alternative answers. Out of these four answers, only one is correct. If the pupil writes the correct answer he or she should be given one mark and if he or she writes a wrong answer, zero should be given. Locus of Control Scale (LCS) is developed by Dr. N. Hasnain and Dr. D.D. Joshi (1992). It has been published by Ankur Psychological Agency and is in Hindi version. The calculated reliability of tool is 0.55 by Spearman-Brown Prophey formula co-efficient of reliability and 0.76 by co-efficient of correlation. Initially 41 items were taken, based on internally and externally locus of control in which 18 positive and 23 negative items appear in randomized manner. The items that reveal internal locus of control were treated as positive items and that reveal external locus of control were taken as negative items. After the item analysis on 500 subjects, discriminative power of 41 items was calculated by method suggested by Goode and Hatt (1952). The items having discriminative power below 0.5 and above 1.00 were dropped except two items having discriminative power of 1.22, five items (2 positive and 3 negative) were thus dropped and 36 items were retained in final scale. Among them are 16 positive and 20 negative items. The testees have to respond in terms of 'Always', 'sometimes' and 'never'. Score of 2,1 and 0 are given to positive terms for 'always', 'sometime' and 'never' respectively. The scoring on negative items is done in a reverse order. Highest score on scale is 72 and the lowest is 0.

Statistical techniques applied to analyze the data

The following statistical techniques have been applied to analyze the data

- Descriptive Statistics: Mean, Median, Mode, Standard Deviation (S.D).
- Inferential statistics: Standard Error of Mean (SE_M), Analysis of Variance (ANOVA, 3 Way)

For ANOVA, to test the significance level, the following level of confidence is established:

  - 0.01 level of confidence
  - and 0.05 level of confidence

- Diagram: Scatter diagram

Findings

After the obtained scores are subjected to statistical treatment it can be concluded that the students had an average level of problem solving ability. With further application of inferential statistics it is found that there is significant difference in internally controlled students and externally controlled students on problem solving ability at adolescent stage as the obtained F-value 44.77 is significant at both levels i.e. .05 and .01 (df=1,99). No

significant difference is found between males and females on problem solving ability at adolescent stage as the F-value obtained is neither significant at .05 level nor at .01 level (df 1 and 99). Also no significant difference is found in urban and rural students on problem solving ability at adolescent stage. The internally controlled males and internally controlled females, externally controlled males and externally controlled females, urban males and rural males, urban females and rural females do not differ on problem solving ability at adolescent stage as obtained F-value is neither significant at .05 level nor at .01 level. The found result has been tabulated in table 1.

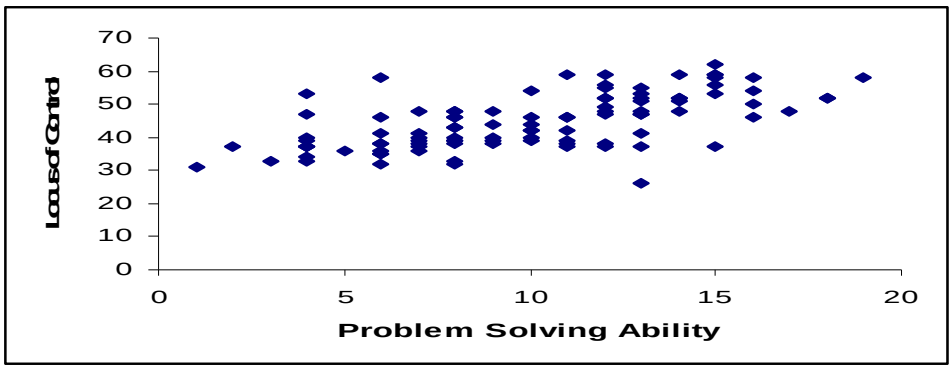
Table 1: Consisting scores of the mean, s.d., $SE_{M,}$ F scores of different groups

S.No.	Group	N	Mean	S.D.	SE_M	F-value (A)	Level of Significance
1.	Internally Controlled	50	12.28	3.46	0.49	44.77	Exits at .01 and .05
2.	Externally Controlled	50	7.74	3.01	0.43		
3.	Male	50	9.84	4.13	0.58	0.25/0.18	No
4.	Female	50	10.18	3.76	0.53		
5.	Urban	50	10.68	4.526	0.64	2.18	No
6.	Rural	50	10.44	3.218	0.455		
7.	Internally Controlled Males	25	12.36	3.462	0.6924	0.57	NO
8.	Internally Controlled Females	25	12.2	3.464	0.6928		
9.	Externally Controlled Males	25	7.32	3.055	0.611	0.57	NO
10.	Externally Controlled Females	25	8.16	2.866	0.573		
11.	Urban Male	25	10.68	4.814	0.9628	0.53	No
12.	Rural Male	25	8.92	3.261	0.6522		

The relation between problem solving ability and locus of control is carried out by Pearson Coefficient of correlation, r and it is found that the problem solving ability is positively correlated with locus of control. The score obtained 0.63 is significant at both .05 level and .01 level (df=98) which implies a significant positive relation exists between problem solving ability and locus of control.

Table 2: Consisting of the Scores of Problem Solving Ability and Locus of Control

S.No.	Group	N	Correlation (r)	df (N-2)	Level of Significance
1.	Problem Solving Ability	100	0.63	98	At .05 and .01
2.	Locus of Control (A)	100		98	



A scatter diagrammatic representation of table 2 scores is laid down in diagram 1, showing a moderate amount of positive relation between two variables, namely, problem solving ability and locus of control.

Discussion

Internally controlled students scored higher in problem solving ability test than externally controlled students. This result can be attributed to the viewpoint that the internally controlled students had confidence in themselves and had the ability to take decision which added on to their ability to solve problems solvers (Elliott, Godshall, Shrout, & Witty, 1990; Priester &Clum 1993). In the current study males and females do not differ significantly at their problem solving ability score. Though in past, a few studies depict a difference between males and females on their problem solving ability score. The researches (Darchingpui,1989; Hoffman & Maier, 1966; Norman & Ronald, 1965) stated significant difference in problem solving ability of males and females. On the other hand, researches (Sharma, 2007; Jacks, 2006) concluded no significant differences in problem solving ability of males and females. It can be noticed that the studies done before the era of modernization laid out a difference between males and females on problem solving ability test, not the recent researches done. This result could lead to viewpoint that more exposure of females to complex situations in a competent world has somehow eliminated the difference between two groups on problem solving ability. A similar reasoning can be laid down for no significant difference between urban and rural students on problem solving ability scores.

Further suggestions

The study is done on a very small sample within the limitation of available funds and time. A larger sample size will lead to a better understanding of the variables and a paradigm shift from quantitative to qualitative will further authenticate the carried out results. Only the well defined laboratory problems do not constitute the ‘problem solving’ zone. Problems are also

vague, ill-structured in nature. Problem solving is a complex concept and a better understanding is required, involving other domains also, namely, social, emotional, personal along with cognitive.

Conclusion

We face problems of one or other type everyday in our life. A toddler may face a problem of a smooth walk without a help, a teenager could have a problem of survival with so called 'cool' attitude within available pocket money or to top in the class. Each one of us is beset with one or the other problem and all around in the society there is an echo of the word 'problem'. In today's scenario from cradle to grave, there exists one or the other problem which demands problem solving ability, so one must be trained since childhood in nourishing and grooming these problem solving abilities as one could face the problems with a greater confidence and continue towards one's goal. The curriculum designed in our education system should enable the child to adapt himself to the society, full of problems. To be successful one must be adequately equipped with proper guidance in training of the problem solving ability. Problem solving ability enables the child to find appropriate solutions to problems which confront him. To meet the demands of world of competition, it has become necessary to develop problem solving ability in today's adolescents; as they are the mentors of future's society. So, it becomes the necessity and moral duty of parents, teachers, curriculum planners, and policy makers to have careful upbringing of adolescents for the development and benefits of individual as well as society. With the advancement in cognitive and other spheres during adolescent period, the ability to think and reason out on given levels of complexity also increases which needs a careful supervision for proper categorization and utilization of their energy.

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