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A STUDY ON INFLUENCE OF PSYCHO-SOCIAL FACTORS ON MATHEMATICAL ABILITY OF SECONDARY SCHOOL STUDENTS

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Abstract:-Research has shown that mathematical ability among students is influenced by psycho-social factors such as study habits and home environment. Mathematical ability involves effective thinking with conceptual learning; students need to be taught to think logically along with practicing the numerical problems. Among the various social groups, home occupies the first and most important place for the development of the individual. Study habit is a well planned and deliberate pattern of study which has attained form of consistency on the part of the student towards understanding academic subject and passing at examination. The purpose of this study was to find out the influence of psycho-social factors on mathematical ability of secondary school students in Shimoga District, Karnataka. The research examined the differences in mathematical ability according to sex as well as the differences in mathematical ability of students based on the level of study habits and home environment. The study involved 100 form VIII standard students (50 boys and 50 girls). The Mathematical Ability Inventory constructed and standardized by the researcher, Study Habits Inventory constructed by Constructed by M.N. Palsane and Sharma and Home Environment Inventory constructed and standardized by Karuna Shankar Misra were used to measure mathematical ability, study habits and home environment of the students respectively. The data was analyzed using Statistical Package for the Social Sciences (SPSS) to determine the mean, standard deviation, t-test, one-way ANOVA and Pearson's coefficient of correlation. The findings of the study indicated that there was a significant relationship of mathematical ability with study habits and home environment. This study also shows there was difference in mathematical ability of students based on their level of study habits and home environment. The findings of the present study highlight the importance of promoting a positive study habits in every aspect in various psychosocial contexts. Positive study habits are key factors for successful learning, general behavioural patterns and high participation in school activities also enhancing academic abilities. Totally, it may be considered that to nurture adolescent's potential, intervention efforts need to be made not only in enhancing their self concept, but also in promoting encouraging home environment.

Keywords: Psycho- Social , Mathematical , study habits and home environment.

INTRODUCTION:

Today in the modern world there are more applications of mathematics and new field of research has been developed that a pupil can generate their knowledge. The study of mathematics was established to produce a competent person who is able to apply knowledge of mathematics in everyday life effectively and responsibly in solving problems and making decisions. Mathematical ability involves effective thinking with conceptual learning; students need to be taught to think logically along with practicing the numerical problems but on the contrary they do practice a problem, and then repeatedly do the same kind of problems until that is hardwired in their brains (Pearse & Walton, 2011).

Successful achievement in any form of activity is based upon study, interpretation and application (Yoloye 1999); and that study should have a purpose. It therefore depends on individual to decide why he or she wants to study, either to gain new ideas or to find out relationship between two different things. What one learns as a result of study depends on the degree at which one succeeds in achieving that aim or purpose. Isangedighi (1997) reports strong correlation between study habits and academic achievement of high school students. Some researchers have found note taking activity as study habits variable to be

beneficial to students. Several investigations have suggested that less skilled reading is characterized by a limitation in short-term memory capacity in addition to inefficient word-identification (Isangedighi, 1997; Yoloye, 1999). But according to (Fagbemi, 2001) the degree of learning depends on the amount of time the child is actively engaged in learning. Study habit always creates talent and skill of problem solving techniques. Study habit is a well planned and deliberate pattern of study which has attained form of consistency on the part of the student towards understanding academic subject and passing at examination. Rastogi (1983) investigated the influence of command over basic arithmetical skill on mathematics achievement. Among the various social groups, home occupies the first and most important place for the development of the individual. Home is the person's primary environment from the time he is born until the day he dies; hence its effect on the individual is also most significant and enduring. Home environment is the most important institution for the existence and continuance of human life and the development of various personality traits. Havighurst (1963) opined that home environment and other family characteristics constitute one of the four most important factors that determine the level of achievement of a child in school. The second is the inborn ability of the child. Third one is the quality of schooling the child receives and the fourth factor is the child's self concept or aspiration level which grows out of family and school experiences. After several years of school experiences the child is able to determine how hard he or she shall work in school and towards what goals. McCartney and Mouley (1992) observed that many of the home based intervention programs like reading stories to children, talking with them, providing toys and playing games-improve children's later performance in school and at times enhance their cognitive functioning.

Studies have revealed that high home environment groups achieved greater success than middle and low home environment groups (Jagannathan, 1986). It has been reported that a positive affective relationship between parents and children increases the likelihood that the child will initiate and persist in challenging and intellectual tasks.

The purpose of the study was to find out the influence of study habits and home environment on mathematical ability of secondary school students in Shimoga District, Karnataka State. The study believed that if students' having good study habits and encouraging home environment, mathematical ability would also definitely improve. Hence the present study.

OBJECTIVES OF THE STUDY

- 1.To find significant relationship of study habits and home environment with mathematical ability of secondary school students.
- 2.To find significant differences in mathematical ability among secondary school boys and girls.
- 3.To find significant differences in mathematical ability among secondary school students belonging to low, moderate and high levels of study habits groups.
- 4.To find significant differences in mathematical ability among secondary school students belonging to low, moderate and high levels of home environment groups.

HYPOTHESES OF THE STUDY

- 1.There will be no significant relationship of mathematical ability with study habits and home environment of secondary school students.
- 2.There will be no significant sex differences in mathematical ability among secondary school students.
- 3.There will be no significant differences in mathematical ability among secondary school students belonging to low, moderate and high study habits groups.
- 4.There will be no significant differences in mathematical ability among secondary school students belonging to low, moderate and high home environment groups.

MATERIALS AND METHODS

The sample of the present investigation was drawn from government and private schools of Shimoga district. The sample comprised of 100 students (50 boys and 50 girls) and was drawn by simple random sampling technique. The Mathematical Ability Inventory constructed and standardized by the researcher, Study habits Inventory constructed by Constructed by M.N. Palsane and Sharma and Home Environment Inventory constructed and standardized by Karuna Shankar Misra were used to measure mathematical ability, study habits and home environment of the students respectively. The coefficients of reliability of the instruments of this study are 0.80 and 0.72, 0.86 respectively. To test two hypotheses, Pearson's Product Moment correlation coefficient was calculated for determining the relationship between variables. The data analyzed and compared with the help of statistical procedure in which arithmetic mean, standard deviation (S.D.) and t-test and F test were used to compare the data.

ANALYSIS AND INTERPRETATION

The Pearson's Product Moment Coefficient of Correlation was calculated for determining the relationship between variables.

Table-1. Significant relationship of Mathematical Ability with Study Habits and Home Environment.

Variables	N	df (N-2)	'r' Value	Sig.
Mathematical Ability and Study Habits	100	98	0.449	0.000*
Mathematical Ability and Home Environment	100	98	0.515	0.000*

Significant level $p < 0.01$

The obtained 'r' values are 0.449 and 0.515, which shows positive significance at 0.01 level ('r' critical value 0.254) between Mathematical Ability with Study Habits and Home Environment of secondary school students. Therefore, a null hypothesis was rejected. It concludes that higher study habits and home environment have higher mathematical ability and vice versa

Table 2. Differences in Mathematical Ability based on sex

Sex	Number	Mean	Standard Deviation	t value	Sig.
Boys	50	22.220	4.131	3.26	0.002**
Girls	50	25.240	5.085		

Significant level $p < 0.01$

A t-test was conducted to better support the finding that there was a significant difference in mathematical ability levels between boys and girls ($t=3.26, p < 0.01$). Therefore, a null hypothesis was accepted. The girls have more mathematical ability than boys.

Table 3. Mean of mathematical ability based on the level of study habits

Test	Study Habits			Source of Variance	Sum of Squares	df	Mean Square	F Ratio	Sig.
	Low	Moderate	High						
Mean Scores	21.470	23.472	26.600	Between Groups	423.067	2	211.534	10.75*	0.000
Standard Deviation	4.567	3.660	5.089	Within Groups	1908.643	97	19.677		

Significant at 0.05 level of confidence,

Table 'F Ratio' =3.09 Table 4. Scheffe's Post Hoc Test

Low	Study Habits		Mean Difference and Sig. Level	Critical Difference	Sig.
	Moderate	High			
21.470	23.472	×	2.001	2.636	0.174
×	23.472	26.600	3.127*	2.725	0.020
21.470	×	26.600	5.129*	2.761	0.000*

*Significant level $p < 0.05$

The above table shows the mean of mathematical ability based on the level of study habits. To determine differences

in mean mathematical ability of students by level of study habits, One-way ANOVA test was adopted. Results of the ANOVA test are shown in Table-3. The above table shows that there are significant differences in mean of mathematical ability scores based on the level of study habits ($F=10.75$, $df = 2, 97$, $p<0.01$). A null hypothesis was rejected. To determine significant differences, a Scheffe's Post Hoc test was applied. The results can be seen in the following Table-4.

As shown in Table-4 there are significant differences in mathematical ability between moderate and high; low and high levels of study habits.

Table 5. Mean of mathematical ability based on the level of Home Environment

Test	Home Environment			Source of Variance	Sum of Squares	df	Mean Square	F Ratio	Sig.
	Low	Moderate	High						
Mean Scores	21.272	22.500	27.454	Between Groups	708.483	2	354.241	21.17*	0.000
Standard Deviation	2.465	5.298	3.961	Within Groups	1623.227	97	16.734		

Significant at 0.05 level of confidence, Table 'F Ratio'=3.09

Table 6. Scheffe's Post Hoc Test

Home Environment			Mean Difference and Sig. Level	Critical Difference	Sig.
Low	Moderate	High			
21.272	22.500	×	1.227	2.484	0.473
×	22.500	27.454	4.954*	2.484	0.000*
21.272	×	27.454	6.181*	2.503	0.000*

*Significant level $p<0.05$

The above table shows the mean of mathematical ability based on the level of home environment. To determine differences in mean mathematical ability of students by level of home environment, One-way ANOVA test was adopted. Results of the ANOVA test are shown in Table-5. The above table shows that there are significant differences in mean of mathematical ability scores based on the level of home environment ($F=21.17$, $df = 2, 97$, $p<0.01$). A null hypothesis was rejected. To determine significant differences, a Scheffe's Post Hoc test was applied. The results can be seen in the following Table-6.

As shown in Table-6 there are significant differences in mathematical ability between moderate and high; low and high levels of home environment.

DISCUSSION OF RESULTS

The results showed that there was a significant relationship between mathematical ability and study habits and the findings also showed that significant differences between mathematical ability based on their study habit levels, while low study habits students have low level of mathematical ability. These findings support the findings of the Choudhury and Das (2012) and Jagannathan (1986) found that the arithmetical ability and study habit influence the achievement in mathematics. The teacher needs to improve their relationship with the students to encourage good study habits through home assignment.

The results also showed that there was a significant relationship between mathematical ability and home environment and the findings also showed that significant differences between mathematical ability based on their home environment levels, the students with high home environment have higher level of mathematical ability. These findings support the findings of the Bandhana and Sharma (2012) studied that students with high home environment have higher level of reasoning ability in comparison to one's having low home environment.

CONCLUSION

It was concluded that there was a significant relationship of mathematical ability with study habits and home environment. This study also shows there was difference in mathematical ability of students based on their level of study habits and home environment. The findings of the present study highlight the importance of promoting a positive study habits in every aspect in various psychosocial contexts. Totally, it may be considered that to nurture adolescent's potential, intervention efforts need to be made not only in enhancing their self concept, but also in promoting encouraging home environment. Furthermore, it becomes the duty of the teachers to assist children who come from disadvantaged home environments by applying various intervention strategies to promote positive self concepts among such adolescents. Positive study habits are key factors for successful learning, general behavioural patterns and high participation in school activities also enhancing academic abilities.

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