

# MATHEMATICAL ABILITY OF HIGH SCHOOL STUDENTS IN RELATION TO THEIR HOME ENVIRONMENT

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## ABSTRACT

*The study has been conducted to investigate the levels of Mathematical Ability and Home Environment of high school students. It also examines the relationship between the Home Environment and Mathematical Ability of the high school students. The study was made on a random sample of 900 high school students in Ariyalur District. The tools used in the study were the Mathematical Ability and Home Environment scale constructed and validated by the researcher. The study reveals the fact that the level of Mathematical Ability and Home Environment at moderate levels. Further, it is noted that there is negligible correlation between the Mathematical Ability and Home Environment among the high school students.*

**Keywords:** *Mathematical Ability, Home Environment, and high school students*

## Introduction

### Mathematical Ability:

Mathematical ability is a human construct, which may be defined cognitively or pragmatically, depending on the purpose of definitions. Cognitive definitions are used when relating to this construct from a theoretical perspective; mathematical ability can then be defined as the ability to obtain, process, and retain mathematical information (Krutetskii 1976; Vilkomir and O'Donoghue 2009) or as the capacity to learn and master new mathematical ideas and skills (Koshy et al. 2009). Pragmatic definitions are usually used when looking at this construct from a perspective of evaluation (e.g., when the focus is on identifying learners' potential or assessing learning outcomes). From this perspective, it can be defined as the ability to perform mathematical tasks and to effectively solve given mathematical problems.

### Home Environment:

The home-environment is defined as the social-setting in which the student interacts with the members of the family. This social setting includes the attitudes or the general dispositions of the parents towards their students, the encouraging or discouraging nature of the parents, the kind of help the parents are ready to render to their students etc.,

Environment studies are all about learning the way we should live and how we can develop sustainable strategies to protect the environment. It helps individuals to develop an understanding of living and physical environment and how to resolve challenging environmental issues affecting nature. In addition to studying the physical aspects of the environment, it also emphasizes the need to conserve biodiversity and adopt a more sustainable lifestyle and utilize resources in a responsible way. To create awareness among today's generation on pressing environmental problems, the University Grants Commission (UGC) has made it mandatory for the universities to introduce a course in environmental studies and teach students about the eco-system, pollution and problems concerned with the environment. Let us discuss the dire need to include environmental studies in the course curriculum.

## REVIEW OF LITERATURE

**Sayed (2002)** examined the effectiveness of problem posing strategies on prospective mathematic ability of students' problem solving performance. The result found that mathematical ability of the are average. The results of the study indicated that the performance of student improved overall when using problem posing strategies.

**Diseth (2003)** compared intelligence, mathematical ability and academic achievement of adolescent boys and girls of IX and XI class. The results of the study showed that there was no significant difference in students of class XI in their academic achievement among intellectually superior and intellectually very superior boys and girls; at other intellectual levels the academic achievement of girls was superior to that of boys. The intelligence test scores of boys were much higher than those for the girls. Boys showed very high correlation between intelligence test scores and academic achievement whereas in the case of girls there was an average correlation.

**Saini (2005)** conducted a study on Home environment and academic achievement of adolescent children of working and nonworking mothers. Sample of 415 adolescents were selected by stratified random sampling method. Major findings of the study were (1) Children of working mothers were more independent than children of non-working mothers (2) As compared to the families and adolescents of working mothers, the families and adolescent children of non-working mothers have higher Mean score in the area of moral and religious emphasis (3) More control exhibits in the families of nonworking mothers as compared to working mothers (4) The higher Mean scores of adolescent children of working mothers

indicates that these children are academically better than those of the children of nonworking mothers.

**Veena Krishnan (2006)** conducted a study entitled “A study on the relationship between achievement motivations and Home Environment among secondary school students of Palakkad District”, found that there is significant relationship between achievement motivation and Home Environment or the two variables achievement motivation and Home Environment are directly proportional. The result found that there is significant different between like gender, type of family, type of school and location.

### **NEED FOR THE STUDY**

Mathematical ability among high school students is a major concern not only for the high school students but also for parents, educational institutions as well as the government. Students are concerned with facing them effectively by putting in more time and efforts and compromising in their entertainments. On the other hand, parents, teachers and government are toiling with finding ways of increasing mathematical ability in pupils and make study activities a useful and pleasurable one. Mathematical ability is experienced due to the perception that the demand exceeds one's resources. It is a well-known fact that the demand on high school students at the secondary and higher secondary level in India is quite high. One reason for such a high demand, which sometimes is unrealistic, by the parents or the family. Inability to satisfy parents' high expectation in studies as well as the achieve goal increases the mathematical ability in the high school students. Understanding how the family environment and School Climate increase the mathematical ability of high school students can enlighten parents and teachers in dealing with the pressing problem. Another way of dealing with mathematical ability could be by strengthening the resources in high school students and help them to set realistic. Exploring the influence of Home Environment and School Climate on high school students Mathematical Ability can throw light on the dynamics of Mathematical Ability.

### **OBJECTIVE OF THE STUDY**

1. To study the level of Mathematical Ability of high school students
2. To study the level of Home Environment of high school students
3. To study the significance of the difference in respect of Mathematical Ability, of high school students with respect to the following sub samples
  - a. Male and female students

- b. Type of school – Boys/ Girls/ Co- Education
  - c. Urban and Rural school students
4. To study the significance of the difference in respect of Home Environment, of high school students with respect to the following sub samples
  - a. Male and female students
  - b. Type of school – Boys/ Girls/ Co- Education
  - c. Urban and Rural school students
5. To study the significant relationship if any between Mathematical Ability and Home Environment.

### **HYPOTHESES OF THE STUDY**

1. The level of Mathematical Ability of high school students is high.
2. The level of Home Environment of high school students is high.
3. There is no significant difference in Mathematical Ability of high school students with respect to the following sub samples
  - a. Male and female students
  - b. Type of school – Boys/ Girls/ Co- Education
  - c. Urban and Rural school students
4. There is no significant difference in Home Environment of high school students with respect to the following sub samples
  - a. Male and female students
  - b. Type of school – Boys/ Girls/ Co- Education
  - c. Urban and Rural school students
5. There is no significant relationship if any between Mathematical Ability and Home Environment.

### **METHODOLOGY**

In order to realize the above said objectives ‘Normative Survey’ method was adopted. A normative Survey method study describes and interprets what exists at present. These are concerned with the existing conditions or relations, prevailing practices, beliefs and attitudes, etc. Such investigations are termed, in research literature, as Descriptive Survey or Normative survey. A total of 900 high school students in Ariyalur District were selected by using Random Sampling Techniques. The tools used in the study were the Mathematical Ability and Home Environment scale constructed and validated by the investigator and the samples

have been employed for the collection of data. The statistical techniques such as mean, standard deviation, 't' test 'F' ratio and correlation have been used for the analysis of the data

## RESULT AND DISCUSSION

For analysis and interpretation of data the study has been analysed in different tables. The same is presented here.

**Table - 1**  
**Mean and Standard Deviation of Variable Scores of the Total Sample**

Variable	N	Mean	S.D
Mathematical Ability	900	31.42	12.41
Home Environment	900	62.74	11.70

The mean value of the Mathematical Ability scores of the total sample is found to be 31.42 and the standard deviation of the same is 12.41. The mean value of Home Environment scores of the total sample is found to be 62.74 and the standard deviation of the same is 11.70. Regarding the total mean score of Mathematical Ability of the High school students is 31.42, which shows a average level of Mathematical Ability. The mean score of Home Environment of High school students is 137.80, which shows the High school students have average level of Home Environment among the entire sample.

**Table -2**  
**Showing Mean, SD and (F & t-test) for students' Mathematical Ability scores of sub samples**

Variables		N	Mean	SD	F/ t-value	P- Value
Gender	Male	412	31.25	12.66	0.364	Not Significant
	Female	488	31.56	12.21		
Type of school	Boys	312	31.46	12.20	0.115	Not Significant
	Girls	223	31.65	12.30		
	Co-education	365	31.19	12.65		
Locality of students	Rural	427	31.06	12.56	0.816	Not Significant
	Urban	473	31.74	12.27		

The details of the calculation are given in the Table 2. The 't' value is found to be (0.364 and 0.816), which is not significant at the 0.05 level. Therefore the null hypothesis is accepted. It is concluded that there is no significant difference between the mean Mathematical Ability scores of (male and female) and (rural and urban) High school students studying in high schools. Also the 'F' value is found to be 0.115, which is not significant at the 0.05 level. Therefore the null hypothesis is accepted. It is concluded that there is no significant difference between the mean Mathematical Ability scores of Boys, Girls and Co- Education High school students studying in schools.

**Table -3**  
**Showing Mean, SD and (F & t-test) for students' Home Environment scores of sub samples**

Variables		N	Mean	SD	F/ t-value	P- Value
Gender	Male	412	62.75	11.62	0.023	Not Significant
	Female	488	62.73	11.78		
Type of school	Boys	312	62.78	11.47	2.782	Not Significant
	Girls	223	64.17	11.45		
	Co-education	365	61.83	11.99		
Locality of students	Rural	427	63.00	11.61	0.645	Not Significant
	Urban	473	62.50	11.79		

The details of the calculation are given in the Table 3. The 't' value is found to be (0.023 and 0.645), which is not significant at the 0.05 level. Therefore the null hypothesis is accepted. It is concluded that there is no significant difference between the mean Mathematical Ability scores of (male and female) and (rural and urban) High school students studying in high schools. Also the 'F' value is found to be 2.782, which is not significant at the 0.05 level. Therefore the null hypothesis is accepted. It is concluded that there is no significant difference between the mean Mathematical Ability scores of Boys, Girls and Co- Education High school students studying in schools.

**Table -4**  
**Relationship between Mathematical Ability and Home Environment of High school students**

Variables	'r' value	Level of Significance
Mathematical Ability	.170	Significant
Home Environment		

A cursory look at table 4, the computed 'r' value 0.170 is significant. It suggests that there is statistically, significant and positive relationship between the mathematical ability and home environment of the high school students. Therefore, the null hypothesis is rejected.

## CONCLUSION

Mathematic subject plays an important role in the entire life of a man. Ability alone gives hundred percent successes in one's life. This indicates that there is no significant difference between boys and girls, rural and urban area students and the high school students studying in Boys school, Girls school and Co-Education schools with respect to their Mathematical ability and Home Environment among high school students. The results show that there is statistically, significant and positive relationship between the mathematical ability and home environment of the high school students.

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