

Relationship between Mathematical Interest and Achievement in Mathematics of Higher Secondary First Year Students



Varghese P I, K.B. Jasmine Suthanthira Devi

Abstract: Student's achievement in a particular subject depends on his/her interest in that particular subject. This present study is to find out to what extent Mathematical Interest of Higher Secondary first year students is related to their achievement in Mathematics. The investigator adopted normative survey method for the study. Stratified random sampling technique was used to collect 100 samples of first year Higher Secondary students of both Government and Aided Higher Secondary Schools in the central coastal area of Kerala. The statistical techniques Pearson's Product - Moment Correlation analysis employed.

Key words: Achievement in Mathematics, Mathematical Interest, Higher Secondary first year students, Coastal Area

I. INTRODUCTION

A. Higher Secondary Education

In our education system Higher Secondary stage occupies a very important place in one's life as it links basic education and university level education where specialised study is carried out. Academic and vocational streams are given importance at Higher Secondary stage and various objectives are laid down as promotion of human values, democratic secular values and cultural heritage, inculcation of scientific temper, prepare them to make decision on future course of action on educational and vocational choices. Education provided at Higher Secondary level is very important as it decides their career and future life. All individual students are unique and cannot be compared one student with another one. Individualised instruction is recommended and variety of methods are employed to catch the students' attention in the classroom. Students are different in their interests, attitude and aptitude. One's achievement in a particular subject depends on his/her interest in that subject. Parents and Teacher can guide the students to pursue the suitable course only if they understand the subjects in which students are interested. The investigator focussed on to find out how Mathematical Interest related to achievement in Mathematics. Higher secondary education is one of the important stages in the process of education system in India because it acts as a link between secondary and higher education at university level.

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The various objectives of higher secondary education are to promote national interest, common brotherhood, democratic values, common cultural heritage, to impart specialized knowledge, skills and attitudes, to develop scientific temper and humanism, to make them independent, self-reliant, duty bound and responsible citizens so that they will become good citizens and involve themselves in the country's various developmental and constructive activities.

B. Achievement in Mathematics

Overall development of students is possible only when education system takes care of three domains of Bloom's Taxonomy, namely Cognitive, Affective and Psychomotor domains. The Cognitive domain concerned with intellectual development and information processing ability of the students for which the study of Mathematics is essential. Mathematical knowledge is required by all the people engaged in various walks of life. Mathematics is called the 'Queen of all sciences' as most of the scientific inventions has become valid only with some mathematical evidences. Mathematics is the subject that developed out of curiosity by man to fulfil human needs and desires. It plays a vital role in the process of education starting from the kindergarten to higher levels of learning. Achievement in Mathematics is the marks scored by higher secondary first year student in the standardised Achievement Test prepared based on the syllabus of class XI. The rationale for mathematical achievement has four dimensions. Firstly, to provide basic Mathematics education so that they can pursue higher education smoothly. The second dimension is to develop powerful ways of logical thinking. Third one is to have greater freedom to choose wider range of careers. Fourth dimension is to make aware of mathematics is not limited to a region or a country but it has high potential as it is universal. Mathematics is the one of the subjects in the school curriculum and overall performance of the students depends upon achievement in Mathematics as all the subjects have some sort of mathematical application. Meaningful study of any subject under the sky is not possible without basic fundamental mathematical knowledge. Considering the importance of Mathematics learning for the development of the students, various commissions and committees recommended Mathematics as a compulsory subject in the school curriculum. The subject Mathematics seem to be very difficult for the students in all ages. Recent studies show that more students fail in Mathematics compared to other subjects taught in the school. There exists various environmental or outside factors such as Mathematics curriculum, Text books, involvement of parents and teachers in the teaching learning process of Mathematics and individual factors,

namely, mathematical interest and intellectual capacity of the students that influence level of achievement in Mathematics. Mathematics curriculum committees constituted by government and non-governmental agencies have been reviewing Mathematics curriculum in order to make Mathematics learning meaningful, enjoyable and enhance the level of achievement in Mathematics. In spite of efforts being put up by Mathematics curriculum committees and teachers for higher level of students' achievement in Mathematics number of failures in Mathematics keeps on increasing. Study is to be carried out what are the other factors influences achievement in Mathematics. This paper presents how mathematical interest of the students is related to their achievement in Mathematics.

C. Mathematical Interest

Students' interest in one area/field is directly proportion to the achievement in that area/field so as mathematical interest and achievement in Mathematics. According to McDougal, 'taking interest' means the bearing of a condition on subject. If a person takes 'interest' in a subject, then he would centralize himself in it despite being tired. "Students' interest in one field is directly proportional to the achievement in that field so as mathematical interest and achievement in Mathematics. Any activity of an individual and gravity of involvement in a particular learning activity depends on one's interest. Behaviour of the students in the Mathematics class and their total involvement and participation in the learning process are closely associated with their mathematical interest. All individuals are unique and diverse in nature as also their interest in specific areas such as Mathematics, Physics, Chemistry, Biology etc. The mathematical interest can be assessed with six items such as I am interested in mathematics, I like to read books and solve brainteasers related to mathematics, Doing mathematics is one of my favourite activities, I often find the things we deal with in mathematics really exciting After a math class, I am often curious about what we are going to do in the next lesson, I would like to find out much more about some of the things we deal with in our mathematics class. [12]

D. Coastal Area

Coastal area is an interface between land and sea and it is diverse and dynamic in nature. The coastal area of Kerala covers nearly 600 km of shoreline. Coastal area of Kerala played a vital role in the formulation of social history and its natural history. It facilitated commercial and cultural links with ancient civilizations of the world. Man has been part of the coastal system for thousands of years and has become a significant force modifying the coastal region - seaward and landward regions. As populations in coastal areas increased, the economic activities diversified. The coastal waters are not only rich in biodiversity but also support the livelihood of a large number of people dependent on the coastal ecosystem, particularly the fishing communities. People traditionally dependent on the coast for their livelihood, who in most cases have lived in harmony with the coastal environment. Under the physiographic conditions of Kerala, the population density has tended to increase towards the coastal region there. The social, cultural and economic environment in the coastal area is totally

different from that of main land. People of coastal area depends mainly on fishing for their livelihood. Since coastal line is always subjected to climatic changes due to storms and rain, their income is uncertain that hampers their social life and educational activities affecting sustainable development of the area without outside support. Government has to implement various social welfare schemes in the coastal area with special emphasis on educational activities of the children.

II. NEED AND SIGNIFICANCE OF THE STUDY

Overall development of the country depends upon development of all the regions of the country including coastal area. Education provided at all levels of education contributes for the individual as well as social development. One of the important subjects taught in the school curriculum is Mathematics and it is generally found that maximum number of students feel difficulty in learning mathematics. Many reasons have been under study for the failure of the students in the subject Mathematics. In this study investigator undertake one aspect to what extent mathematical interest of students influences achievement in Mathematics. The results of this study would be beneficial for the both parents and teachers in cultivating mathematical interest among children. Teachers play a pivotal role in the overall development of students. A teacher can execute his role in the best possible manner only if he/she understands the nature of the students in terms of their interest, attitude and aptitude. Mathematical Interest is one of the influencing factors that decides the level of achievement in Mathematics. Teacher can guide those students who have greater Mathematical Interest in such a way that they can be directed to take courses having higher mathematical applications.

III. OBJECTIVES OF THE STUDY

1. To find out the relationship between achievement in mathematics and mathematical interest among higher secondary plus one students.
2. To find out the relationship between achievement in mathematics and mathematical interest among higher secondary plus one male students
3. To find out the relationship between achievement in mathematics and mathematical interest among higher secondary plus one female students.

IV. HYPOTHESIS OF THE STUDY

1. There is no relationship between achievement in mathematics and mathematical interest among higher secondary plus one students.
2. There is no relationship between achievement in mathematics and mathematical interest among higher secondary plus one male students.
3. There is no relationship between achievement in mathematics and mathematical interest among higher secondary plus one female students.

V. METHODOLOGY

In this study investigator used a normative survey method. Stratified random sampling technique was applied to select sample of 100 Higher Secondary first year students studying in the government and aided schools in the coastal areas in Kerala. Tools used for this study are Mathematics Achievement Test and Mathematical interest scale. The statistical techniques such as Pearson’s Product - Moment Correlation analysis.

VI. ANALYSIS AND INTERPRETATION

Relationship Between Mathematical Interest and Achievement In Mathematics of Higher Secondary First Year Students for The Total Sample

The data for achievement in Mathematics collected conducting an achievement test and for the mathematical interest, mathematical interest inventory was administered among higher secondary first year students. The collected data were subjected to Pearson’s Product - Moment Correlation analysis to find out the extent of relationship between Mathematical interest and Achievement in Mathematics of student. The details are presented in Table -1

Hypothesis (H₀)

There exists no significant relationship between Mathematical interest and Achievement in Mathematics of Higher Secondary first year students of Kerala. Data and Results of the Relationship between Mathematical interest and Achievement in Mathematics of Higher Secondary first year students for the Whole Sample

Table – 1

Variables	r value	't'	S.E r	Confidence Interval		Share d Variance	Interpretation
				Lower	Upper		
Mathematical interest	0.488	5.53*	0.076	-0.3387	0.6376	23.81	Substantial Relationship
Achievement in Mathematics							

* Significant at 0.01 level

Table-1 shows that the degree of relationship (The coefficient of correlation) between Mathematical interest and Achievement in Mathematics for whole sample is 0.488 and it is higher than the value set for significance at 0.01 level. The obtained 't' value (5.53) is greater than the table value (2.58) at 0.01 level of significance with 99 degrees of freedom and the obtained correlation is significant at 0.01 level which lies in between the confidence interval -0.3387 and 0.6376. Hence the null hypothesis is rejected. The result shows a substantial relationship (Garret 2005, p;176)

between Mathematical interest and Achievement in Mathematics of the Higher Secondary first year students. It is evident from the result that there is a considerable dependence between the variables. High Mathematical interest will affect his/her Achievement in Mathematics of a student and vice versa. Since the obtained 'r' is Positive, increase in Achievement in Mathematics will effect a corresponding Increase in the Mathematical interest of student. The obtained 'r' has a shared variance 23.81%. This suggests that about twenty percentage of shared variation can be attributed between the two variables.

Relationship Between Mathematical Interest and Achievement In Mathematics of Male Students

To find out the extent of relationship between Mathematical interest and Achievement in Mathematics of male Higher Secondary first year students, the collected corresponding scores of Mathematical interest and Achievement in Mathematics was analysed using Pearson’s Product - Moment Correlation analysis. The details of analysis are presented in Table- II

Hypothesis (H₀)

There exists no significant relationship between Mathematical interest and Achievement in Mathematics of male student. Data and Results of the Relationship between Mathematical interest and Achievement in Mathematics of Male Higher Secondary first year students

Table - II

Variables	r value	Sample Size	't'	S. Er	Confidence Interval	Share d Variance	Interpretation
Mathematical interest	0.495	50	3.89*	0.107	(-0.2794 to 0.7006)	24.01	Substantial Relationship
Achievement in Mathematics							

*Significant at 0.01 level

Table-II shows the co-efficient of correlation between Mathematical interest and Achievement in Mathematics for male Higher Secondary first year students is 0.495 and it is found to be higher than the value set for the significance at 0.01 level. The obtained 't' value 3.89 is greater than the table value 2.58 at 0.01 level of significance with 48 degrees of freedom and the obtained correlation is significant at 0.01 level which lies in between the confidence interval -0.2794 and 0.7006. Hence the hypothesis is rejected.

Relationship between Mathematical Interest and Achievement in Mathematics of Higher Secondary First Year Students

The result clearly shows that there is a substantial relationship between Mathematical interest and Achievement in Mathematics of the Higher Secondary first year students. That is there exists a considerable dependence between the variables under study. Higher Mathematical interest will have higher levels of Achievement in Mathematics of a male students and vice versa. Since the obtained 'r' is Positive, increase in Achievement in Mathematics will effect a corresponding Increase in the Mathematical interest of male student . The obtained 'r' has a shared variance 24.01%. This suggests that about twenty four percentage of shared variation can be attributed between the two variables.

Relationship Between Mathematical Interest and Achievement In Mathematics of Female Higher Secondary First Year Students

The degree of relationship between Mathematical interest and Achievement in Mathematics in the case of female Higher Secondary first year students was analysed Mathematics using Pearson's Product - Moment Correlation analysis. The corresponding scores of Mathematical interest and Achievement in Mathematics of female students were considered for this analysis. The details of analysis are presented in Table- III

Hypothesis (H₀)

There exists no significant relationship between Mathematical interest and Achievement in Mathematics of female students.

Data and Results of the Relationship between Mathematical interest and Achievement in Mathematics of Female Higher Secondary first year students

Table -III

Variab les	r val ue	Sa mpl e Siz e	t	S. Er	Confi dence Interv al	Shar ed vari ance	Interpr etation
Mathe matical interest	0.4 35	50	3.3 0*	0.0 36	(- 0.204 1, 0.655 8)	18.4 9	Substa ntial Relatio n-ship
Achiev ement in Mathe matics							

*Significant at 0.01 level

From the Table-III, the result of the analysis of variable under study regarding female higher secondary first year students in the coastal area is analysed. The co-efficient of correlation between Mathematical interest and Achievement in Mathematics for female Higher Secondary first year students is 0.435. It is higher than the value set for the significance at 0.01 level. The obtained 't' value 3.30 is greater than the table value 2.58 at 0.01 level of significance with 498 degrees of freedom and the obtained correlation is significant at 0.01 level which lies in between the confidence interval -0.2041 and 0.6558. Hence

the hypothesis is rejected. The result establishes that the relationship between Mathematical interest and Achievement in Mathematics of the female student substantial. This result reveals that there exists considerable dependence between two variables- Mathematical interest and achievement in Mathematics. Higher Mathematical interest of a female students will have higher Achievement in Mathematics and vice versa. Since the obtained 'r' is Positive , increase in Mathematical interest will effect a corresponding Increase in the Achievement in Mathematics of female student . The obtained 'r' has a shared variance 18.49%. This suggests that eighteen percentage of shared variation can be attributed between the two variables.

VII. FINDINGS OF THE STUDY

There exists considerable dependence between Mathematical interest and Achievement in Mathematics. Findings of the study are as follows:-

1. There exists relationship between achievement in mathematics and mathematical interest among higher secondary plus one students.
2. There exists relationship between achievement in mathematics and mathematical interest among higher secondary plus one male students.
3. There exists relationship between achievement in mathematics and mathematical interest among higher secondary plus one female students.

VIII. IMPLICATIONS OF THE STUDY

Two main aims of education are individual aim and social aim. Study of Mathematics helps in achieving these two aims as it accelerates the intellectual development of each student and the prosperity of the society. Interest and achievement are closely correlated and study on relationship between mathematical interest and achievement in Mathematics is undertaken by the investigator. The results of this study can be made aware of both teachers and parents so that they can create an atmosphere in the school and at home to have an conducive learning environment where natural mathematical interest is developed among students. This study is carried out only for the higher secondary first year students and it can be extended to all stages of education; also this study is limited to the central coastal area of Kerala that can be extended to whole coastal area. Various techniques to create mathematical interest may be developed for the students at all levels of education as to make learning of mathematics interesting and students make higher levels of achievement in Mathematics. This study will be benefited for both the teachers and parents in turn to all the students in their study of Mathematics. This study is limited to higher secondary first year students of central coastal area of Kerala and only Mathematical Interest is related to the achievement in Mathematics. This study can be extended to complete coastal line of India as development of the coastal area is as important as other areas and all stages of Education. Also other appropriate variables can be integrated in studying the combined effect on achievement in Mathematics.



IX. CONCLUSION

The present study is to find out the relationship between Mathematical interest and Achievement in Mathematics of higher secondary plus one students in the central coastal area of Kerala. It is found that Mathematical interest and Achievement in Mathematics are closely related. It is found to be true for the higher secondary plus one male students as well as female students. Teachers and Parents are to take initiative to create Mathematical interest among the children. The awareness programmes can be conducted to both Teachers and Parents so that they won't blame the students for not scoring satisfactory marks in Mathematics instead they should cultivate mathematical interest. There are many methods and techniques to create Mathematical interest in the students and make Mathematics learning easy and enjoyable.

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