



A STUDY ON MATHEMATICAL ATTITUDE OF SECONDARY SCHOOL STUDENTS AND ACHIEVEMENT IN MATHEMATICS

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Abstract:

Study of Mathematics at secondary level is the foundation stage of Higher Education. Every secondary school student should study mathematics as a compulsory subject so that he/she gains a basic quantum of Mathematical knowledge as a part of general education. In the present study data have been collected from secondary students through questionnaire and their attitudes have been compared. Attitudes towards are the important determinants of academic success and achievement. In order to succeed in a subject, positive attitude towards a subject is a necessary prerequisite. The main purpose of the study was to measure relationship of attitude towards mathematics with academic achievement of the students in mathematics among 8th and 9th class secondary level students. Sample of the study consisted of 800 students out of which 400 were boys and 400 were girls. A 60-item questionnaire was self developed in the light of available literature on the subject and adaptation of another instrument, Academic achievement was measured by the marks obtained by the sample in their recently held examination in mathematics in their school. The obtained data were analyzed and interpreted using statistical tool of correlation coefficient. The result show that boys differed in their mathematical achievement from girls. Boys achieved better results as compared to girls.

Keywords: Students attitude, mathematics, mathematical achievement, secondary school level

Introduction

Mathematics is a creation of human mind concerned chiefly with ideas, processes and reasoning. It is much more than Arithmetic, more than Algebra more than Geometry. Also it is much more than Trigonometry, Statistics, and Calculus. Mathematics includes all of them. Primarily Mathematics is a way of thinking, a way of organizing a logical proof. As a way of reasoning, it gives an insight into the power of human mind, so this forms a very valuable discipline of teaching-learning programmes of school subjects everywhere in the world of curious children. So the pedagogy of Mathematics should be very carefully built at different levels of school education

Mathematics is the mother of all sciences. It is the most important subject in human life. It cannot be possible to maintain daily living without mathematics. Each country has their own mathematical languages, terms, symbols, counting systems etc. In every sphere of life mathematics is used to a great extent. Mathematics is used to satisfy the essential requirements of any individual. It helps to think rationally and logically and to solve problems with diversified nature. It is not a subject that deals with the numbers only, but it helps to improve our creativity that helps to find out best possible solution of the problems. It is generally stated that mathematics is abstract in nature. To acquire knowledge in mathematics, one should devote concentrated efforts fully to the subject. To learn mathematics requires patience and practices. Mathematics is considered the backbone of all sciences. Our social progress, life style, daily living and different types of amenities depends on the development of modern technologies. On the other hand, unprecedented technological advancement largely depends on mathematics. Mathematical skills are very useful to success in the fields of technology, science and most of the social science subjects. Mathematics is also used for common purposes, like Marketing, Accounting, making family budget, maintaining daily expenditure etc.

Attitude towards Mathematics

Mathematical attitude of an individual indicates his/her opinion, liking and disliking about mathematical concepts and mathematical problems. It may be positive, negative or neutral. Here, firstly attitude and then mathematical attitude will be discussed. One of the important objectives of education is the development of desirable attitude in the students. Attitude is a central part of human identity. The word 'attitude' is derived from a Latin word 'aptus', which means 'fitness' or 'adaptation'. So, attitude denotes a subjective or mental state of preparation for action. Everyday people have different feelings viz. loving, hating, liking, disliking, favouring, opposing, agreeing, disagreeing, arguing, persuading etc. about different things. All these are evaluative responses to an object. Attitude can be defined as 'a summary evaluation of an object of thought' (Bohner & Wanke, 2002). Attitude is a learned predisposition or tendency of an individual to respond positively or negatively to some object, situation, concept or another person.

Gall, Borg and Gall (1996) define attitude as “an individual’s viewpoint or disposition towards a particular, object (a person, a thing, or an idea)”. They consider attitude to be an individual’s way of seeing and reacting to a social phenomenon, and assert that it varies from person to person.

Academic Achievement

Academic achievement, in general, refers to the degree or level of success or proficiency attained in some specific area concerning scholastic or academic work. Academic achievement may be defined as excellence in academic disciplines, in class as well as extracurricular activities. It includes excellence in behaviour, confidence, communication skills, abilities, punctuality, assertiveness, arts, sporting and culture. Academic achievement of an individual is so far considered to be influenced in part by his ability to adjust to his environment, in part by his special abilities, attitude and intelligence, which are integral part of his personality and in part by the intensity of drives and motives which serves as an impelling factor his activities. So, academic achievement denotes the degree or level of success and attainment of proficiency in some specific area concerning scholastic and academic work. According to the great Greek Philosopher, Plato, “Academic achievement means the attainment level, at which a student functions in his or her school task through a regular curriculum in a fixed place which is named as academy.”

Explored on Prospective Primary School Teachers Attitudes Towards Teaching Mathematics. The study found out that there is no significant difference between the attitude scores of the freshmen and juniors of the prospective primary school teachers. It is generally expected that prospective primary teachers' attitudes towards teaching mathematics (Mesut Tabuk 2022)

Explore on a study on relationship between achievement in mathematics and attitude towards mathematics of secondary school students, in terms of gender difference. In the study the students achievement in mathematics and attitudes towards mathematics were examined.(Monoranjan Bhowmik and Bharati Banerjee 2022).

Statement of the Problem

The title of the study is “A Study on Mathematical Attitude of Secondary School Students and Achievement in Mathematics”

Objectives of the Study

The following objectives were framed in the present study.

1. To study gender-wise difference in student's attitude towards mathematics for different class.
2. To study is there any relationship between attitude and achievement of a student in mathematics for different class.

Hypotheses of the Study

Keeping in view the above objectives of the study, the following hypotheses have been framed.

1. There will be a significant difference in the attitude levels of high school students towards learning mathematics with respect personal variable viz. like Gender, and class.
2. There exists a positive relation between achievers in Mathematics and their attitude towards the mathematics subject.

Method of the Study

This is a quantitative study which explores Mathematical Attitude of Secondary School Students and Achievement in Mathematics". I was chosen to study area Nirmal district in this mathematics understanding. Nirmal District has shown a consistent pattern of low math scores among students, indicating a need for targeted interventions and support. By focusing on this specific region, I hope to gain a deeper understanding of the underlying factors contributing to these difficulties and develop effective strategies to address them. Having understood of the background of the problem and also what necessitates the Researcher to undertake a study on the felt problem, the Researcher finds the Descriptive Survey form of research to be beneficial to realise what is being questioned. Therefore, the Researcher chooses to adopt the descriptive form of research.

Sample of the Study

The sample for the present study were consisted of 800 secondary school students studying in **VIII Class** and **IX Class**. The stratified random sampling were applied for 800 students eight Urban Mandals and eight Rural Mandals were selected for the study by adopting Stratified Random Sampling technique.

Tools for the Present Study

1. Attitude of Students towards Learning Mathematics
2. Achievement Test for Class VIII and IX in Mathematics

The above mentioned tools have been developed by researcher

Statistical Techniques of the Study

The Statistical techniques were employed in this study

Descriptive statistics such as Mean, Standard Deviation, Correlation were employed to describe the distribution of scores. The Inferential Statistics such as "t" Test were employed to test the variations and associations of variables considered in the study.

Analysis and interpretation of data

Hypothesis1: There will be a significant difference in the attitude levels of high school students towards learning mathematics with respect personal variable viz. like Gender, and class.

Table 1: Showing the result of ‘t’ test with respect to variable ‘Gender’ for 9th class students Attitude towards Mathematics

9th class	Variable	N	Mean	S.D	t	Sig.
Gender	Girls	200	189.51	16.69	8.12**	0.01
	Boys	200	201.5	12.54		

It could be observed from table-1 that the mean scores of the Girls and Boys groups could able to bring the t value significant for attitude scores of 9th classtudents towards learning mathematics. The calculated mean value of Boys is higher than Girls. It goes to significant value. Therefore the hypothesis “There will be no significant difference in the attitude levels of Secondary school students towards learning Mathematics with respect to variable Gender” is *Rejected*.

Table 2: Showing the result of ‘t’ test with respect to variable ‘Gender’for 8th class students Attitude towards Mathematics

8th class	Variable	N	Mean	S.D	t	Sig.
Gender	Girls	200	185.82	24.99	8.78**	0.01
	Boys	200	209.17	28.07		

**Significant at 0.01 level

From table 2 it could be observed that the obtained ‘t’ values for thevariable „Gender“ is significant at 0.01 level of the table value. The result indicates that 8th class Boys have high value when compare to Girls. This indicates that the difference is 24 mean points. Attitude of Boys towards mathematics is good when compare to Girls. Therefore the hypothesis “There will be no significant difference in the attitude levels of Secondary school students towards learning Mathematics with respectto Gender” is *Rejected*.

Table 3: Showing the result of 't' test with respect to variable 'Class' for Attitude towards Mathematics

Overall	Variable	N	Mean	S.D	t	Sig.
Class	8th class	400	197.05	15.57	2.91*	0.05
	9th class	400	200.01	12.54		

*Significant at 0.05 level

The table -3 indicates that there is a significant difference between the 8th class and 9th class students in their attitudes towards leaning mathematics. The mean score of 8th class is (197.05), where as 9th class students possess (200.01) towards learning mathematics. The obtained 't' value (2.91) is significant at 0.05 level of confidence. Therefore the hypothesis "There is no significant difference in the attitude level of Secondary school students towards learning Mathematics with respect to variable Class" is *Rejected*. It concludes that increase in class increases the level of confidence, positive approach and better attitude towards leaning mathematic.

Table 4: Showing the results of 'r' between the Attitude towards in learning mathematics and achievements of students of 8th class in relation to demographical variable.

Sl.No	Name of the Variable	Category (8 th class)	N	r	Sign
1	Gender	Boys	200	0.22	*
		Girls	200	0.34	**

NS-Non Significant, *Significant at 0.05 level, **Significant 0.01 levels

Table 5: Showing the results of 'r' between the Attitude towards in learning mathematics and achievements of students of 9th class Students in relation to gender.

Sl.No	Name of the Variable	Category (9 th class)	N	r	Sign
1	Gender	Boys	200	0.38	**
		Girls	200	0.40	**

The results presented in table- 4 and 5 reveals a positive significant relationship between Attitude towards mathematics and achievements of students in relation to variables gender.

Conclusion

The result show that boys differed in their mathematical achievement from girls. Boys achieved better results as compared to Girls. A lot need to be done to fill this gender gap in mathematics achievement. Girls and boys students should make the competitive environment, coordinate and exchange their knowledge from one another in mathematics teaching and learning. Girls students should be informed the importance of mathematics and it is the basic tool for further education. Mathematics teaching and evaluation strategies should be bias- free. This way, boys and girls will tend to see themselves as equals, capable of competing and collaborating in classroom activities.

Educational Implication of the Study

1. Providing opportunity to students for posing problems of mathematics and solving them. Real life problems can also be analyze in a group and more ideas inMathematical Quizzes are a good medium for sparking interest among students in problem solving, communication and connection academic standards. These couldbe within a school or across the schools in the form of competition.
2. Making conjectures, building arguments, testing them, generalize them and verifying results. Students should be encourage to present ideas, prepare talks and deliver in front of students and teachers. The formation of a mathematics club in a school can help to create stimulating mathematical environment in the school, by applying Puzzles in a systematical way.
3. Mathematical Laboratories can have models of different kinds including Geometrical shapes and solid objects like Spheres, Cone, Cubes etc; charts of interesting curves; biographies of mathematicians, computers with mathematics software, etc posters, charts, equipment for explaining thermos or making measurements can be kept in this laboratory.
4. Projects involving explorations of daily life situations, group discussions, collection of data, analysis, explanation and presentation.
5. Mathematics teaching/learning can be made more interesting by telling students about the lives and work of some mathematicians and their contribution, evolutionto society.
6. In service training programmers must be incorporated to inculcate the attitude and develop the knowledge among the teachers to identify and understand the childrenwith learning difficulties. Teachers should participate compulsorily with great zeal and enthusiastic spirit, no teacher should give space for escaping from the newly organized and innovative programmers' by the department or agencies of education.

Suggestions for Further Study

The researcher presents the following suggestions for further study.

1. Study may be extended to other subjects viz Languages like English, Hindi, and Sanskrit etc. and non language subjects like Science, Social studies.
2. The present problem of the study may be conducted as an experimental study.
3. The study may be extended to the higher level.
4. Attitude and Perception of the teachers towards learning difficulties may be correlated with achievement of the students.
5. The problem of the study may be extended to the special children.

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