

A STUDY ON NUMERICAL APTITUDE AND ACADEMIC ACHIEVEMENT IN MATHEMATICS AMONG HIGH SCHOOL STUDENTS

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Abstract

Every child gains knowledge by instructions he receives at the school. Organized around a set of core math activities, teacher assigns tasks to pupils and evaluates and compares the quality of their work. The term used in this study is Academic Achievement in the academic works of high school students. This study aims to find out the relationship between Numerical Aptitude and Achievement in Mathematics among High school students. The objectives, hypotheses are tested on the sample of 300 IXth standard students randomly selected from different types of school in Tamil Nadu. The tool used to test the Numerical Aptitude of the ninth standard students was numerical aptitude test designed by George K. Burnett. The major finding in this investigation shows that there is High positive relationship between Academic Achievement and Numerical Aptitude in mathematics of the High school students.

Keywords: *Academic Achievement, Numerical Aptitude, Mathematics Achievement, High School Students, Educational Measurement*

Introduction

Mathematics education teaches students to perform addition, subtraction, multiplication, and division. It teaches the use and understanding of fractions, decimals, and integers. Mathematics also teaches students reasoning and problem-solving skills that are critical to succeed in both the work world and other subject areas. It contributes to our general competencies in reading and writing by promoting logical and critical thinking. Mathematics can also be a cooperative activity by teaching students to learn from each other. Achievement is the amount of knowledge and skills derived from learning. In the course of time, pupils are differentiated according to how well they perform a variety of tasks, most of which require the use of symbolic skills. As pupils proceed through successive school levels, the vigor of achievement increases for those who continue along the academic line.

Significance of the Study

Although Education is not the only road to success in the working world, much effort is made to identify, evaluate, track and encourage the progress of students in schools. Parents care about their child's academic performance because they believe good academic results will provide more career choices and job security. Learning methods contribute to one's

academic success; the aspects a student learns depend upon his learning methods. According to Smith (1961) motivation, attitude, aptitude, interest and intelligence level constantly facilitates academic progress and attainment. Numerical Aptitude is the study related to the Aptitude to deal with simple arithmetic. In this context the researcher tries to investigate whether Numerical Aptitude influences Academic Achievement of High School Students.

Objectives of the Study

1. To find out the significant relationship between Numerical Aptitude and Academic Achievement among the High school students.
2. To find out the significant difference in the Academic Achievement among the High school students in relation to gender.
3. To find out the significant difference in the Academic Achievement among the High school students in relation to location of school.
4. To find out the significant difference in the Academic Achievement among the High school students in relation to medium of instruction.

Hypotheses of the Study

1. There is no significant relationship between the Academic Achievement and Numerical Aptitude in Mathematics among High School Students.
2. There is no significant difference among the High School Students in their Academic Achievement based on gender.
3. There is no significant difference among the High School Students in their Academic Achievement based on location of school.
4. There is no significant difference among the High School Students in their Academic Achievement based on medium of instruction.

Research Methodology

The description of the tool, the selection of sample and the research procedure followed in this investigation are presented below.

Sample

The sample consisted of 300 IXth standard students randomly selected from different types of school in Tamil Nadu.

Tool used

The tool used to test the Numerical Aptitude of the ninth standard students was numerical aptitude test designed by George K. Bernett. This test consists of forty arithmetical problems. Next to each problem there are five answers marked A, B, C, D and

E only. One of these suggested answers is right. Students have to pick out the one correct answer for each problem. Then mark X in the circle under its letter on the separate answers sheet. Then the answer sheet is scored according to the scoring key provided to the author. The score values are then tabulated. The score is calculated using the formula $R - \frac{1}{4} W$, Where R is right responses and W is wrong responses.

Data Collection

The numerical aptitude test was administered to 300 subjects in groups of 30 after seeking permission from the Heads of institution and teachers. Subjects were asked to read the instruction carefully and then answer. The Mathematics achievement Scores of IXth standard students in their quarterly examination were obtained from the concerned class teachers.

Statistical Techniques

Suitable descriptive and inferential statistical techniques were used in the interpretation of the data to draw a more meaningful picture of results from the collected data.

Analysis of Data

Data collected from 300 IX Standard High School students from the private, government and government aided schools of Chennai were subjected to statistical analysis. The statistics used are critical ratios and correlations.

Table 1 Showing the Relationship between Academic Achievement and Numerical Aptitude in Mathematics among High School Students

Variable	N	Correlation value	Level of significance
Academic Achievement in mathematics	300	0.810	0.01
Numerical Aptitude in mathematics			

From the above table, it is observed that there is high positive relationship between Academic Achievement and Numerical Aptitude in Mathematics of the high school students. Therefore, the null hypothesis is rejected.

Table 2 Showing the Significant difference between the High School Students in their Academic Achievement based on Gender

Variable	Gender	N	Mean	Std. deviation	Critical ratio	Level of significance
Academic Achievement in mathematics	Male	150	46.80	14.093	1.352	NS
	Female	150	48.88	12.516		

From the above table it is observed that the critical ratio value 1.352 is less than the table value at 0.05 level (1.96). Hence there is no significant difference among the High School Students in their Academic Achievement based on gender. Therefore, the hypothesis is accepted.

Table 3 Showing the Significant difference among the High School Students in their Academic Achievement based on Location of School

Variable	Location of school	N	Mean	Std. deviation	Critical ratio	Level of significant
Academic Achievement in mathematics	Rural	154	46.34	11.896	2.013	0.05
	Urban	146	49.42	14.596		

From the above table it is observed that the critical ratio value 2.013 is greater than the table value at 0.05 level (1.96). Hence there is significant difference among the high School Students in their Academic Achievement based on location of school. Therefore, the hypothesis is rejected.

Table 4 Showing the Significant difference among the High School Students in their Academic Achievement based on Medium of Instruction

Variable	Medium of instruction	N	Mean	Std. deviation	Critical ratio	Level of significance
Academic Achievement in mathematics	Tamil	156	46.27	12.003	2.035	0.05
	English	143	49.38	14.442		

From the above table it is observed that the critical ratio value 2.035 is greater than the table value at 0.05 level (1.96). Hence there is significant difference among the High School Students in their Academic Achievement in based on medium of instruction. Therefore, the hypothesis is rejected.

Major Findings of the study

1. There is High positive relationship between Academic Achievement and Numerical Aptitude in mathematics of the High school students.
2. There is no significant difference among the High School Students in their Academic Achievement based on gender.
3. There is significant difference among the High School Students in their Academic Achievement based on location of school.
4. There is significant difference among the High School Students in their Academic Achievement based on medium of instruction.

Discussion

The study reveals that the two variables are interrelated and failures can be avoided by appropriate approach to the subject. A liking and a right attitude towards the subject can be inculcated by teachers, if highly motivated students develop a liking to the subject. With the knowledge of a numerical aptitude students may be encouraged to take equivalent subjects related to numerical aptitude. There is found to be a significant relationship between numerical aptitude and achievement in mathematics. Students should be given adequate opportunity in number work (from the beginning of their school life).

Conclusion

The study shows that the increase in numerical aptitude of the students gives rise to excellent academic achievement. There is a greater need for the schools to create ways of increasing numerical aptitude in the students so that there can be better academic achievement.

References

1. Aggarwal, A. P. (1990). *Statistical methods: Applications and computations*. Sterling Publishers.
2. Best, J. W. (1959). *Research in education*. Prentice Hall of India.
3. Castle, F. (1916). *A manual of practical mathematics*. Macmillan & Co.
4. Fremont, H. (1969). *How to teach mathematics in secondary school* (Sounders science teaching series). Saunders.
5. Harari, D. H. (1938). *Mathematics teaching*. Harper & Row.
6. Jha, D. S., & Grewal, D. (1999). *Under-achievements in mathematics as a function of concept learning*.