Achievement in Mathematics of Secondary School Students in Relation to their Numerical Aptitude

Prof. Puran Singh, Chairperson, Deptt. of Education, Kurukshetra University, Kurukshetra
Naveen Kumar, Research Scholar, Deptt. of Education, Kurukshetra University, Kurukshetra

ABSTRACT

Today Mathematics is more relevant in the context of society than ever before, but by and large, Mathematics has not realized how big the demand is for Mathematics in the society. Newer & newer situations involving Mathematics knowledge are encouraged by the common man day by day. Much has been written and talks presented on world class standards that pupils need to achieve in Mathematics. After describing its characteristics the present study assumes greater significance in case of Secondary School students as they are at their adolescent period. As most of the psychologists agree that it is a period of stress and strain, so we must pay special attention to their needs achievement and motivation which greatly affect the achievement in Mathematics at secondary stage. The discussion in the preceding paragraph forms the basis of raising the issue of Secondary School student’s achievement in Mathematics in relation to their Numerical Aptitude.

INTRODUCTION

Mathematics is an essential part of nearly all scientific studies. It helps scientists to design experiments & analyze data. Scientists use mathematical formulas to express their findings precisely and to make predictions based on their findings. The physical sciences, such as Astronomy, Chemistry & Physics rely heavily on Mathematics, whereas Social Sciences, Economics, Psychology & Sociology depend greatly on statistics and other kinds of mathematics. In spite of political instability during the period up to the 18th century, the native system of education maintained its traditional structure up to the advent of British.

The science of 'Mathematics education' is still in its infancy. In any curriculum, content and presentation of content are the two most important and inseparable components. The application of learning theories in content presentation is of very recent origin. Research evidence is inadequate to say anything definite about which method is going to be the most effective for presentation of a particular type of content. However, methodology also involves the arrangement of the content in a hierarchical manner. The entire process is composed of complex psychological principles. The commission points out that, 'In the teaching of Mathematics emphasis should be more on the understanding of basic principles than on the mechanical teaching of mathematical computations'. Commenting on the prevailing situation in schools, it observed that 'in the average school today instruction still confirms to a mechanical routine, continues to be dominated by the old besetting evil of verbalism and therefore remains as dull and uninspiring as before’.

Today Mathematics is more relevant in the context of society than ever before, but by and large, Mathematics has not realized how big the demand is for Mathematics in the society. Newer & newer situations involving Mathematics knowledge are encouraged by the common man day by day.

Nearly every part of our lives involves Mathematics. It is playing an essential role in the development of modern technology, tools, materials, techniques and sources of power that make our lives and work easier.

We use Mathematics for such simple tasks as telling time from a clock or counting out-change after making a purchase. We also use Mathematics for such complex tasks as taking up a household budget or balancing our cheque book, cooking, driving, gardening, saving etc. Our many other activities involve mathematical calculations. Mathematics is also a part of many games, hobbies & sports.

NEED OF THE STUDY

Numerical Aptitude has become an important concept for a number of reasons. First Numerical Aptitude is thought to fulfill basis psychological needs such as need to know and need to succeed. Second, Numerical Aptitude is thought to influence future behaviors, such as interest in working on a Mathematics project at home or making mathematical calculations.

Main characteristic of Mathematics teaching today is the teaching of facts & related concepts. Some attention has been given to Achievement in Mathematics, but it still remains inconsistently defined in the literature and obscure in teacher plans. Daily practices tend to focus on recall of
facts, concepts & principles, while the development of Numerical Aptitude at best it considered peripheral to these cognitive outcomes.

OPERATIONAL DEFINITIONS OF KEY TERMS

1. **Numerical Aptitude**: the term numerical aptitude deals with the ability of solving of numerals, digits. It is the ability which deals with numbers and other mathematical concepts and has an ability of solving different problems related to different areas of calculations and predictions. It is a strategy of having ability of solving different problems related to different areas of calculation and predictions.

2. **Achievement in Mathematics**: It means percentage of marks obtained in Mathematics by particular student in previous class. C.V. Good Dictionary in Education defines, “Achievement means accomplishment or proficiency of performance in a given skill or body of knowledge.” Achievement in Mathematics means the performance of student in Mathematics subject of curriculum in the educational institutions.

3. **Secondary School Students**: Secondary School students are those who are studying in class 9th in Senior Secondary Schools recognized by Board of Secondary Education, Haryana, only.

OBJECTIVES

1. To analyze the numerical aptitude of the secondary school students.
2. To analyze the achievement in Mathematics of the secondary school students.
3. To determine the group differences among boys and girls in relation to their numerical aptitude.
4. To determine the group differences among boys and girls in relation to their Achievement in Mathematics.
5. To assess the relationship between numerical aptitude and achievement in Mathematics of the secondary school students.

HYPOTHESIS

1. There is no significant difference between the secondary school boys and girls in numerical aptitude.
2. There is no significant difference between the secondary school boys and girls in achievement in mathematics.
3. There is no relationship between numerical aptitude and achievement in mathematics of the secondary school students.

METHODOLOGY

Keeping in view the nature of the present study, survey method was considered to be appropriate.

SAMPLE

For the present study the investigator firstly collected the list of different government schools in Bhiwani district. Then the investigator decided to select randomly 4 government schools and 100 students of 9th class were selected as a sample from these schools using stratified random sampling technique in which 50 were boys and 50 were girls from Bhiwani district of Haryana. The following chart gives a clear description about the representation of the sample.

**Distribution of the Sample**

<table>
<thead>
<tr>
<th>Sample Size</th>
<th>Urban</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 Boys</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>50 Girls</td>
<td>25</td>
<td>25</td>
</tr>
</tbody>
</table>

TOOLS USED

In the present study, the investigator has used the following tools:

i. Numerical Aptitude test by George K. Bennett, Harold G. Seashore and Alexander G. Wesman.
ii. Achievement Test in Mathematics developed by Dr. Prhlad Singh Yadav(1984).

COLLECTION OF DATA

The Investigator visited the schools personally for the collection of data. The population of the present study constituted 100 students of Bhiwani District studying in Senior Secondary Schools randomly.

So they were requested to be free, frank, bold, honest and sincere in answering the questions.
SCORING OF DATA

i. Numerical Aptitude test by George K. Bennett, Harold G. Seashore and Alexander G. Wesman.

ii. Achievement Test in Mathematics developed by Dr. Prhlad Singh Yadav (1984).

Then a scoring key was used in order to quantify the information disclosed in the study.

STATISTICAL TECHNIQUES USED

i. Calculation of t-value

ii. Correlation

MAIN FINDINGS

Findings relating to the numerical aptitude

♦ The numerical aptitude of the secondary school boys is found to be very low. The boys of class 9th do possess very low numerical aptitude. They are poor in solving mathematical problems. They have less ability to solve problems relating to numerals and digits. Thus it shows that the secondary school boys are poor in numerical conceptualization as well as in mathematical calculations.

♦ The numerical aptitude of the secondary school girls is also found to be low. They have less ability of solving problems relating to mathematical calculations. They possess low numerical aptitude thus they feel difficulty in solving problems relating to numerals. Thus it can be said that both the secondary school boys and girls possess low numerical aptitude and are poor in mathematical calculations.

Findings relating to the academic achievement in mathematics

♦ The boys of the secondary school in academic achievement in mathematics fall below the expected score. The boys possess poor ability in solving mathematical problems. They acquire poor marks in achievement test in mathematics and showed poor numerical aptitude.

♦ The secondary school girls in academic achievement in mathematics also fall in below the expected average score. They are having poor ability in numerical aptitude. So they are unable to score good marks in achievement test in mathematics. Thus the both the secondary school boys and girls are poor in mathematical calculations and possess low achievement in mathematics.

Findings relating to the co-relational studies in different variables

♦ A low but positive correlation between numerical aptitude and academic achievement in mathematics of the secondary school students is found. This reflects that achievement in mathematics shows a positive relationship between numerical aptitudes of the secondary school students.

SUGGESTIONS

The present study was delimited to only one district of Haryana namely Bhiwani. Similar study can be conducted in other area of the country.

1) The present research work was conducted on IX class students of Senior Secondary School of Bhiwani. Similar study can be conducted on Primary and high schools also as well as college level.

2) Similar study can also be done on disabled children or special need children.

3) Similar study can be extended to a large sample so that more generalized result can be obtained

4) The present study investigates the achievement in mathematics, Numerical Aptitude. Similar study can be conducted on other subjects also.

REFERENCES


research in mathematics education (Reston, VA), Vol. 29, p. 41-62.


[10] Dave, P.N. and others (1988), Pupils Achievement at the Primary stage, Dept. of Pre-School and Elementary Education, N.C.E.R.T.


[17] Jagannadhan, K., The Effect of Certain Socio-Psychological Factors on the academic achievement of children studying in class V to VII, Ph.D, Edu., SVU.,

