

A STUDY ON ACHIEVEMENT LEVELS OF MATHEMATICS COMPETENCIES AMONG THE SECONDARY LEVEL STUDENTS

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Abstract

The Present study revealed that on teacher of mathematics generally observes that a student having high achievement in mathematics does not necessary maintain same position in other subjects. The inadequate methods of teaching interior text books insufficient reference material, untrained teachers, out dated syllabus and un-psychological approach to instruction are the main factors causing dislike the subjects. The mathematics is an integrated subject. In fact, mathematics of any kind is abstract in nurture and very often the learner does not know what mathematics in about. Why he is respected to learn and what he would gain form is. The teaching learning process should proceed along all five competencies inside the class or outside the classroom. Teaching learning process should provide knowledge of competencies of mathematics to the learner.

Keywords: Teaching learning process, Mathematics, Achievement and Learner

Introduction

Mathematics has helped man to utilize special concepts in his daily life. The value of mathematics lies in its practical utility. It is a tool for improving thinking and for some others it is simply persued because they enjoy it. All the valid reasons for engaging with the discipline and have implications for teaching mathematics in school.

By including mathematics in the school subjects, we want children to develop skill and understanding in the various curricular areas related to numbers and space and logical thinking reasoning and day to day problem solving.

Definition of Mathematics

The term of mathematics defined as “The science of numbers and their operations, interrelations, combinations, generalisations and their structure, measurement, transformations and generalizations” which is given by **Marriam – Webster (1998)**.

Importance of Mathematics

Mathematics is a methodical application of matters. Mathematics makes our life orderly and prevents chaos. It is the cradle of all creations without which the world cannot move an inch. Mathematics is the numerical and conclusion part of man’s life and knowledge. It deals with qualitative facts and relationships as wells with problem involving space and farm. Certain qualities that are nurtured by mathematics are as follows.

- Power of reasoning
- Creativity
- Abstract or spatial thinking, critical thinking
- Problem- solving ability
- Effective communication skills.

Values of Mathematics

Broadly speaking there is three main confederations for which a child is sent to school education must contribute towards the acquirement of these values.

- 1) Knowledge and skill
- 2) Intellectual habits and powers
- 3) Desirable attitudes and ideals

These three values can be called utilitarian disciplinary and cultural values respectively.

Aims of Teaching Mathematics

The following are the aims of teaching mathematics at school level.

- 1) To enable the child to solve mathematical problems of his daily life.
- 2) To prepare the child for technical profession.
- 3) To develop the habits of concentration self reliance and discovery.
- 4) To provide a suitable type of discipline to the mind at the learner.
- 5) To prepare to child to economic purposeful, productive, creative and constructive living.

Definition and Meaning of Achievement

As per Webster's twentieth century dictionary achieve to bring about by effort or something done successfully. And the quality and quantity of a student's work.

"Achievement is the process of gaining on obtaining something that has been done or achieved through effort, a result of hard work"

Competencies in Mathematics

"A competency is a set of defined behaviours that provide a structured guide enabling the identification, evaluation and development of the behaviours in individual".

- Webster's Twentieth Century dictionary

The clear idea about academic standards as follows;

- They are clear statements even normal public should understand them.
- They guide as for the teaching learning process about what skill to be performed by the children after learning.
- They guide us for the assessment of child's performance.
- Sometimes they may be defined for more than one content.
- Sometimes they may be defined with connecting of multiple skills.
- Sometimes they may be defined with multi concepts competencies in mathematics are as follows;

Problem solving

Whatever the mathematics concept is understand, it should be applied in various different situations. The student should think and establish relation with his different experience daily life. Therefore, to understanding problem solving, we need to understand the following steps in problems solving.

- Identify what is given
- Identify what is to be found
- Understanding what concepts are involved
- Visualizing whole the above items.
- Get ideas about procedures, formulas for the solution.
- Selection of best procedure or formula
- Substitution, manipulation / calculation

- Arriving solution
- Conclusion
- Generalisation
- Trying out other strategies, formulas, procedure for the solution.
- Finding shortcut.
- Explaining procedures and reasoning
- Creating similar problems in various situations with various types of numbers.

Reasoning – Proof

Reasoning is a fundamental character to the knowing and doing of mathematics conjecturing and demonstrating logical validity of conjectures are the essence of the creative act of doing mathematics, mathematics teacher has been felt so as learn everything from the teacher. This opinion is making the students to completely depend upon teachers have been so as learn everything from teacher. The student should perform reasoning proof.

- Understanding and making mathematical generalisations, intuitions, and conjectures.
- Understanding and justified procedures
- Examining logical arguments
- Uses inductive and deductive logic.

Communication

Communication is an essential part of mathematics and mathematics learning. It is a way of sharing, clarifying, reasoning, generating our understanding.

Connections

To develop in conceptualisation process, the student has to link or connect things in logical manner one only by one, finally generalizes and comes to conclusion. Moreover, if we look at problems solving the students decides a strategy to solve the problem after ‘making connection’ in between the given things in the data of the problem. Therefore, in the process of development of logic or problem solving, “making connections” is an important skill in mathematics learning.

Visualisation and Representations

Visualisation creates mental images in the mind when these mental images are related or linked with logic, visualisation about a context or situation or procedure is formed.

1. The pupils shall develop the capacity for investigation self study and generalisation.

Need of the Study

The Indian education commission (1964-66) has observed one of the important social objective of education is to equalise opportunities enabling the backward or under privileged classes and individual to use education as a level for the improvement of their condition.

To confirm what is the average mathematics competencies achievement levels of fifth class students in selected school of Chityalmandal of Warangal District. The study further definition the important of the management of school and other demographics factors of the learners on their achievement levels of mathematics competencies.

There would be dispersion in achievement level of competencies in mathematics of students on the basis of sex and management of school in which

Statement of the Problem

“A STUDY ON ACHIEVEMENT LEVELS OF MATHEMATICS COMPETENCIES AMONG THE SECONDARY LEVEL STUDENTS”

Objectives of the Study

1. To find out whether there is any significance difference between boys and girls in achievement levels of mathematics competencies.
2. To find out whether there is any significance difference between students of private and government schools in achievement levels of mathematical competencies.
3. To find out whether there is any significance difference between boys of private and government schools in achievement levels of mathematics competencies.
4. To find out whether there is any significance difference between girls of government and private schools in achievement levels of mathematics competencies.
5. To find whether there is any significant difference between boys and girls of government schools in achievement levels of mathematics competencies.

Hypothesis of the Study

1. There is no significance difference between boys and girls in achievement level of competencies in mathematics.
2. There is no significance difference between government school students and private school students in achievement levels of competencies in mathematics.
3. There is no significance difference between private and government school students of boys in achievement level of competencies in mathematics.
4. There is no significance difference between government and private schools of girls in achievement level of competencies in mathematics.
5. There is no significance difference between boys and girls of government schools in achievement level of competencies in mathematics.

Methodology

The investigator has selected the normative survey method. The method of research which concern itself with the present phenomena it terms of conditions, practice, belief, processes, relationship, or trends in variously turned as normative survey. Worthwhile studies collect three types of information.

Characteristics of Normative Survey

1. It is not concerned with the characteristics of individuals but with characteristic whole population or a sample there.
2. It collects data from a relatively number of subjects.
3. It provides information useful to the solution of local problems.
4. Its scope is very vast
5. Survey may be qualitative (or) quantitative
6. Descriptions may be either verbal (or) expressed in mathematical terms

Design of the Study

The important part of the research is design of the study which guides the research to move in a direction of the study. The present study is intended to find out achievement level of mathematics competencies among primary school students in Warangal District.

For the purpose of the study five governments and three private schools were taken from Warangal district. Samples of 100 fifth standard students were considered 50 students from government schools and 50 students from private schools.

Sample of the Study

The sample for the present investigation has been drawn from various private and government schools in Warangal district. The selected sample for the study were 100 comprises of boys (50) and girls (50). The student belongs to private schools (50) and the student belongs to government school (50) were included.

Tool Used in Investigation

A competency wise achievement test was constructed by the present investigator which seeks or measure what the child having competencies of mathematics by using a test, among fifth standard students.

Construction of Tools

The investigator constructed a tool to study competencies of mathematics achievement test of fifth standard students. It consists of 40 items of multiple choiceses with covering of five competencies for each competency consists of eight items. The test was prepared with appropriate instructions and to be worked out the answer in the same question paper.

Procedure of Administering the Test

The investigator selected schools which had class rooms with good light and ventilation for administering the test with the help of Head Master (or) teachers, students were asked to sit sufficiently for apart so that they do not copy.

Special instruction was given orally to the group students were asked to read the directions given in the question paper and researcher read it again a loudly. Each candidate was given on question paper to write answers in appropriate brackets in the question paper.

Final Scores

The mathematical competencies level of achievement test was scored with the use of scoring key each problem carries one mark and maximum score is to be “40 scores”

Reliability

A test must be reliable, that is, it must have the ability to consistently yield the same result when repeated measurements are taken of the same individuals under the same condition. It indicates the consistency or stability of the test.

Validity

The process of gathering evidence to determine whether the test really measures the required character is known as validation.

Validity is that quality of a data gathering instrument or procedure that enabled it to determine what it was designed to determine. (Best – 1953).

The test was given to senior expert in the field and senior school teachers to give their judgement about each item in the tool and its validity. They made some suggestions and they were it was carried out.

Hence, it can be considered that the tool has validity.

Data Analysis and interpretation

Analysis of the data means studying the tabulated material in order to determine inherent facts or meanings. Larger division of material should be broken into small units and arranged in new combinations to discover new factors and relationships.

The present study discusses the results related to the variables for the study. It mainly presents the results related to the difference between selected variables

Hypothesis-1 There is no significance difference between boys and girls in achievement level of competencies in mathematics of test scores.

Achievement of Competencies in Mathematics with respect to Gender

Group	N	Mean	S.D.	t-value	Level of Significance
Boys	50	28.96	7.64	1.24	N.S [@]
Girls	50	30.26	7.01		

@ No Significant at 0.05 levels

The table 1 represent the mean of boys is 28.96 and girls mean is 30.26. The standard deviation (SD) for the same groups being 7.64 and 7.01 respectively.

The t-value is found 1.24, which less than table value 1.98 at 0.05 level for df=98. Hence, null hypothesis is accepted.

It is concluded that there is no significance difference between boys and girls in achievement of mathematics competencies of test scores.

Hypothesis-2 There is no significance difference between government school students and private school students in achievement level of competencies in mathematics of test scores.

Achievement of Competencies in Mathematics with respect to Management

Group	N	Mean	S.D.	t-value	Level of Significance
Government school students	50	28.16	8.35	2.81	S*
Private school students	50	31.06	5.86		

*Significant at 0.05 level

The table 2 represent the mean of government school students is 28.16 and private school students mean is 31.06. The standard deviation (SD) for the same groups being 8.35 and 5.86 respectively.

The t-value is found to be 2.81, which greater than table value 1.98 at 0.05 levels for df 9.8. Hence, null hypothesis is significance.

It is concluded that there is a significance difference between government school students and private school students in achievement of mathematics competencies of test scores.

Hypothesis-3 There is no significance difference between private and government school students of boys in achievement level of competencies in mathematics of test scores

Achievement of competencies in mathematics with respect to private school boys and govt school boys.

Group	N	Mean	S.D.	t-value	Level of Significance
Private school boys	25	28.92	6.10	0.03	N.S [@]
Government school boys	25	29.0	8.80		

@ No Significant at 0.05 level

The table 3 represent the mean of private school boys is 28.92 and government school boys mean is 29.0. The standard deviation (SD) for the same groups being 6.10 and 8.80 respectively.

The t-value is found 0.03, which less than table value 2.01 at 0.05 level for df 48. Hence, the null hypothesis is retained at 0.05 level.

It is concluded that there is no significance difference between private and government school students of boys in achievement of mathematics competencies of test score.

Hypothesis-4 There is no significance difference between government and private school of girls in achievement level of competencies in mathematics of test scores.

Achievement of competencies in mathematics with respect to government school girls and private school girls.

Group	N	Mean	S.D.	t-value	Level of Significance
Government school girls	25	27.32	7.30	3.35	S*
Private school girls	25	33.3	4.52		

* Significant at 0.01 level

The table 4represent the mean of government school girls is 27.32 and private school girls mean is 33.2. The standard deviation (SD) for the same groups being 7.30 and 4.52 respectively.

The t-value is found to be 3.35, which is greater than table value 2.69 at 0.01 level for df48. Hence, null hypothesis is rejected at 0.05 level of significance.

It is concluded that there is a significance difference between the boys of government and private schools in achievement of mathematics competencies of test scores.

Hypothesis-5 There is no significance difference between boys and girls of government schools in achievement level of competencies in mathematics of test scores.

Achievement of Competencies in mathematics with respect to Government school boys and government school girls.

Group	N	Mean	S.D.	t-value	Level of Significance
Government school boys	25	29.0	8.72	0.72	N.S@
Government school Girls	25	27.32	7.30		

@ No Significant at 0.05 level

The table 5 represent the mean of government school boys is 29.0 and girls mean is 27.32. The standard deviation (SD) for the same groups being 8.72 and 7.30 respectively.

The t-value is found to be 0.72, which is less than table value 2.01 at 0.05 level for df=48. Hence, null hypothesis is retained at 0.05 level of significance.

It is concluded that there is no significance difference between government school boys and girls in achievement of mathematics competencies of test scores.

Hypothesis-6 There is no significance difference between boys and girls of private schools in achievement level of competencies in mathematics of test scores.

Achievement level of competencies in mathematics with respect to private school boys and private school girls

Group	N	Mean	S.D.	t-value	Level of Significance
Private school boys	25	28.92	6.26	2.71	S*
Private school Girls	25	33.20	4.52		

* Significant at 0.05 level

The table 6 represent the mean of private school boys is 28.92 and girls mean is 33.20. The standard deviation (SD) for the same groups being 6.26 and 4.52 respectively.

The t-value is found to be 2.71, which is greater than table value 2.01 at 0.05 level for df=48. Hence, null hypothesis is rejecting at 0.05 level of significance.

It is concluded that there is no significance difference between private school boys and girls in achievement of mathematics competencies of test scores.

Hypothesis-7 There is no significance difference between government school boys and private school girls in achievement level of mathematics competencies of test scores.

Achievement level of competencies in mathematics with respect to government school boys and private school girls.

Group	N	Mean	S.D.	t-value	Level of Significance
Government school boys	25	29.0	8.72	2.10	S*
Private school Girls	25	33.2	4.52		

* Significant at 0.05 level

The table 7 represent the mean of government school boys is 29.0 and private school girls mean is 33.2. The standard deviation (SD) for the same groups being 8.72 and 4.52 respectively.

The t-value is found to be 2.10, which is greater than table value 2.01 at 0.05 level for df=48. Hence, null hypothesis is rejected at 0.05 level of significance.

It is concluded that there is a significance difference between government school boys and private school girls in achievement of mathematics competencies of test scores.

Hypothesis-8 There is no significance difference between government school girls and private school boys in achievement level of mathematics competencies of test scores.

Achievement of competencies in mathematics with respect to government school girls and private school boys.

Group	N	Mean	S.D.	t-value	Level of Significance
Government school girls	25	27.32	7.30	0.814	N.S@
Private school boys	25	28.92	6.1		

@ No Significant at 0.05 level

The table 8 represent the mean of government school girls is 27.32 and private school boys mean is 28.92. The standard deviation (SD) for the same groups being 7.30 and 6.1 respectively.

The t-value is found to be 0.814, which is less than table value 2.01 at 0.05 level for df=48. Hence, null hypothesis is retained at 0.05 level of significance.

It is concluded that there is no significance difference between government school girls and private school boys in achievement of mathematics competencies of test scores.

Findings

1. There is no significance difference between boys and girls in achievement levels of mathematics competencies of test scores. The mean difference is also not much difference between boy and girls scores.
2. There is a significance difference between government school students and private school students in achievement levels of mathematics competencies of test scores. The mean difference between government school students and private school students is varying.
3. There is no significance difference between private school boys and government school boys in achievement levels of mathematics competencies of test scores.
4. There is a significance difference between government school girls and private school girls in achievement levels of mathematics competencies of test scores. There is a significance difference between means of government school girls and private school girls.
5. There is no significance difference between boys and girls of government school students in achievement levels of mathematics competencies of test scores. The mean of government school boys and girls are all most same.
6. There is a significance difference between boys and girls of private school students in achievement levels of mathematics competencies of test scores. The means of private school boys and girls is lies in significance difference.
7. There is a significance difference between government school boys and private school girls in achievement levels of mathematics competencies of test scores. The means of government school boys and private school girls lies in significant difference.

Conclusions

1. It is conclude that there is no gender difference in achievement level of the competencies in mathematics.
2. The private school students are affective in achievement of competencies in mathematics, compare to the government school students, because they provide sufficient teaching hours, drilling hours, labs etc.

3. There is no management difference in achieving the competencies in mathematics among the boys.
4. The private school girls are affective in achieving the competencies in mathematics; compare to the government school girls. Because most of the girls studying in the government school came from economically poor background and lack of mal nutrition's feeding which effect their studies.
5. There is no gender difference in government schools. But there is a gender difference in private schools in achieving the competencies mathematics.
6. Private school girls are affective in achieving the competencies in mathematics, compare to the boys of govt. schools due to lack of facilities, their background.
7. Government school girls and private school boys have the same achievement capacity regarding competencies in mathematics.
8. There is a gender variation in rural areas. Most of the rural boys who are being better English medium private, corporate schools. Rest of the rural boys who below the poverty line have been studying government schools and most of the rural girls are studying in local schools. Thus girls are more affecting in achieving the competencies in mathematics than boys in rural areas.

Bibliography

Amin, S.M.R. et al (2001). A study measuring the achievement of competency in mathematics of the students of class – V. Mymensingh: National Academy for primary Education.

Best, W. John (1976). Research in Education, New Delhi, Prentice Hall of India (e) limited.

BhaskaraRao, D and Pushpalatha, D (1995). Achievement in mathematics, (Competencies) New Delhi, Discovery Publications.

Dubey, L.N. (1998). Manuel for mathematical achievement test Agra, National Psychological Corporation.

Dutta, D.K. (2003). Achievement survey at the end of the class V, abstract of educational research studies conducted by SCERT, Assam.

Gina Marie Vallani Seton Hall University (2014). A dissertation “The influence of early childhood programme participation on academic achievement at elementary level”.

Gresham. G (2009). A study of mathematics anxiety in preservice teachers. Early childhood education Journal. 35, 181-188 [cross ref.](#)

Gupta, R.C. (1972). Backwardness in mathematics and basic arithmetic skills, unpublished Ph.D. Edu. Delhi Univeristy.

John Hutchingon (1993). An introduction to contemporary mathematics.