



“A STUDY ON EFFECTIVENESS OF TEACHING MATHEMATICS BY USING LEARNING MATERIALS AMONG VIII STANDARD STUDENTS”

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INTRODUCTION

Education has been considered as a natural process. The process of education started even during the prehistoric period when man in his primitive stage began to apply his intelligence to adapt himself to his environment and fulfill the needs of his life. The process of education of man begins when he is in the womb of his mother. Then gradually he learns from the family, community and other members of society. In this connection it may be noted that, family, community, society and environment are all educational institutions which continue to educate him since birth. But formal and planned education is given in schools only. The education given by the above institutions is a natural process which is received by every person according to his aptitude and capability. So they do not influence all equally. They only prepare the necessary background for formal education in schools. The basis of this education is institution, while education in schools is based on institution, experimentation and practice. These institutions continued to impart education till the schools were established. But with the development of civilization the previously simple and limited life of man became more and more complex. And today when man is making newer inventions with his efforts and he has controlled a large part of nature, family society and other institutions cannot fulfill even a small portion of educational needs. Today man requires a systematic and planned education which should continue throughout the life in one form or the other. Only then he will be able to get acquainted with the latest human achievements.

The destiny of any nation is being shaped in classrooms; this is a wonderful saying related to education. For any country to be progressive it is most essential that the people must be educated. In formal education, teaching is important device used to educate the people. Hence teaching must be effective to make the people to be better educated. Effective teaching consists of their teaching decisions about actions, routines and techniques that increase the decision making capabilities of students. Effective teaching is much more than initiative process. More additional methods, materials and technology make the teaching to be effective during teaching learning process.

Education is defined as the modification of human behaviour. The main aim of teaching mathematics is the all-round development of the individual. For this purpose the teacher should think of the objectives of teaching mathematics. From them the expected behavioral changes can be brought among people. But we must see how far the aims of teaching mathematics and education are identical. This will stimulate and guide the teacher to adopt effective methods, devices and illustrative materials. This will avoid aimless teaching. Aimless teaching makes the work uninteresting and results in wastage of time, energy and material resources both on the part of teacher and pupils. No subject can be taught without having aims and objectives of teaching. Mathematics is a subject of great educational values and makes a major contribution in achieving the aims of education. Teaching of mathematics considers a child to acquire knowledge and skill, to develop intellectual habits and power and to develop desirable attitude and ideals.

Teaching Learning Materials

Senses are gateways of knowledge. Sensory experiences form the foundation for any intellectual activities. These experiences could be affected by means of a number of teaching aids otherwise called teaching learning materials. Teaching aids reinforce the spoken and written words with concrete images thus provide rich perceptual images which are the bases for learning. They bring the outside world into the classroom and make us teach effectively. While using teaching aids the teacher should be clear about the objectives of instruction and thus make the right use of the right material at the right place and at the right time.

Teaching learning materials are devices which present units of knowledge through auditory or visual stimuli or both with a view to help learning. They concretize the knowledge to be presented and then help in making a learning experience, appear real, living and vital.

NEED AND IMPORTANCE OF THE STUDY

Low volume of information and less complex concepts have to be learnt in the traditional system of education. So there was no need of TLM in that system, but now a days student are expected to learn more within a short interval, hence the TLM's are needed in teaching. The use of teaching aids in teaching of mathematics is of recent origin. We have been using text books, writing materials, geometric instruments, and the blackboard since long as indispensable equipment for mathematics classes. All these are now considered as sensory aids. For many years resourceful teachers have been using models, instruments, drawings and other devices or stimulating interest and to facilitate learning of mathematics. Since mathematics is considered as a dry subject, to create interest in learning mathematics has been a constant problem for teacher.

As mathematics is abstract in nature, in order to make the subject to be concrete to the students we need TLM's in teaching of mathematics. It is generally believed by the students that mathematics as an easy learning subject; we can make use of TLM's in teaching. As TLM's used will be more attractive and related, the teaching learning process becomes effective. The TLM's can make children to use more than one sensory organs, can help to clarify, establish and calculate accurately the concepts, interpretations and make mathematics a interesting subject. It helps the student to make his/her learning permanent and make them remember for a longer period of time. Many of the time teaching mathematics goes on without TLM's that will not give fruitful result when compared to the use of TLM's. Hence this study is carried out to identify the effectiveness of teaching using TLM's on children, it also includes the comparisons between teaching using TLM's and teaching without using TLM's among the groups. It is a study to deal with a practical problem of using TLM's in teaching mathematics and how it helps the students to learn more effectively. The findings shall be directly implemented into mathematics teaching to make students learn more effectively.

STATEMENT OF THE PROBLEM

“A STUDY ON THE EFFECTIVENESS OF TEACHING MATHEMATICS BY USING TEACHING LEARNING MATERIALS AMONG VIII STANDARD STUDENTS”

OBJECTIVES OF THE STUDY:

1. To find out the effectiveness of teaching Mathematics without using Teaching Learning Materials (TLM's) for VIII standard students.
2. To analyze the effectiveness of teaching mathematics using TLM's for VIII standard students.
3. To compare the effectiveness of teaching mathematics between the selected groups of VIII standard students.
4. To compare the effectiveness of teaching mathematics without using TLM's between the boys and girls of VIII standard students.
5. To compare the effectiveness of teaching mathematics with using TLM's between the boys and girls of VIII standard students.

OPERATIONAL TERMS USED:

Teaching: It is a systematic activity that takes place between teachers and students. It takes place in a situation comprising of both controllable and uncontrollable factors.

Effective Teaching: Consists of those teaching decisions about actions, routines and techniques that increase the decision making capabilities of students. It is an intuitive process.

Teaching Learning Material (TLM's): It is anything by means which the learning process may be encouraged or carried out through the sense of hearing or sense of sight.

Type of School: It is a Government High School situated in Varthur, Bangalore City.

Subject: Mathematics – It is one of the core subjects in state level syllabus; it is a abstract in nature.

HYPOTHESES OF THE STUDY:

1. There is no effectiveness of teaching mathematics between control and experimental group of VIII standard students.
2. There is no effectiveness of teaching mathematics by traditional method between VIII standard boys and girls (Control Group)

3. There is no effectiveness of teaching mathematics by using Teaching Learning Materials between for VIII standard boys and girls (Experiment Group)
4. There is no effectiveness of teaching mathematics between control and experimental group boys.
5. There is no effectiveness of teaching mathematics between control and experimental group girls.

RESEARCH DESIGN

Experimental method was selected for this study. In experimental method “The one-group pretest- posttest design was selected for this study.

In the one –group pretest- post design, a single group is measured or observed not only after being exposed to a treatment of some sort, but also before. A diagram of this is as follows.

The two group test design

Group	Independent variables	Post-test
Experimental	X	Y2
Control	-	Y2

SAMPLING

Sampling is a process of selection of sample from a population.

Population: By population we mean “the aggregate or totality of objects or individuals regarding which, inferences were to be made in a sampling study”. The population is very large and therefore ordinarily it is not possible to conduct the study for whole population.

In the present study Government High School situated in Mysore city was constituted as population. With the help of Random sampling technique only one school was selected for the study.

Sample: Sampling is the process by which a relatively small number of individuals, objects or events is selected and analyzed in order to find out something about the entire population from which it is selected.

In the present study, 80, VIII standard students of Government High School, Mysore were constituted as sample. These 80 students were selected with the help of purposive sampling.

DESCRIPTION OF THE TOOL USED FOR THE COLLECTION OF THE DATA

Diagnostic test is designed to identify specific learning difficulty in a specific area of learning. And it identifies strengths and weaknesses in a specific learning area. It reveals that how much mastery is there in an individual.

In the present study the tool administered for the purpose of data collection was diagnostic test, which was designed to diagnose effectiveness of teaching of mathematics.

DATA COLLECTION

Government High School, Mysore was selected for the collection of data. Permission from the head master and concerned class teacher of VIII standard to collect data was obtained. Before administering the test the investigator had some informal talk with the students to make them feel free. Prior to the test the investigator gave some instructions regarding the test. Answer sheets and question paper were provided to all students.

On the basis of performance sample has been selected for the study. Sample included both boys and girls for this study based on test performance given to control group students in mathematics test. The students were diagnosed for the study. Test was given to the selected sample. The time allotted for the test was second period (mathematics period) of the daily timetable. For two weeks interventions were given to the students. Researcher answered number of questions asked by the students while giving teaching of mathematics by using teaching learning material. To find out the impact of TLM of mathematics, test was administered to experimental group.

STATISTICAL TECHNIQUES USED IN THE STUDY:

For analyzing and processing the data quantitatively the investigator has used different statistical techniques. Since the objective of the study was to find out effect of teaching of mathematics by using teaching learning material of students in mathematics, the investigator

used 't'-test to find out the significant differences between control and experimental group students. Thus mean, standard deviation and 't' test were used.

ANALYSIS AND INTERPRETATION OF DATA

Hypothesis-1

There is no effectiveness of teaching mathematics between control and experimental group VIII standard students.

Showing the Number, Mean Standard Deviation, 't' value and level of significance between control and experimental group scores of effectiveness of teaching mathematics of VIII standard students.

Group	Test	N	Mean	S.D	't' value	Level of significance
Group	Control	40	10.775	4.774	3.293	**
	Experiment	40	14.450	5.198		

The above table reveals that the obtained 't' value of 3.293 is greater than the 't' table value of 1.99 at 0.05 and 2.64 at 0.01 level of significance with degrees of freedom 78, the value was found to be significant. Hence the null hypothesis is rejected and in its place an alternative hypothesis is formulated that "there is a effectiveness of teaching of mathematics by using teaching learning materials between control and experimental group VIII standard students"

It can be also inferred from this that teaching of mathematics by using teaching learning material was affected in experimental group students.

Hypothesis-2

There is no effectiveness of teaching mathematics by traditional method between control group VIII standard boys and girls.

Showing the Number, Mean, Standard Deviation ‘t’ value and level of significance between control group VIII standard boys and girls scores of effectiveness of teaching mathematics by traditional method.

Group	Test	N	Mean	S.D	‘t’value	Level of significance
Control Group	Boys	20	10.350	4.556	0.558	NS
	Girls	20	11.200	5.063		

The above table reveals that the obtained ‘t’ value of 0.558 is less than the ‘t’ value of 2.02 at 0.05 level of significance with degrees of freedom 38, the value was not found significant. Hence the null hypothesis accepted that “there is no effectiveness of teaching mathematics by traditional method between control group VIII standard boys and girls.”

Hypothesis-3

There is no effectiveness of teaching mathematics by using teaching learning material between experimental group VIII standard boys and girls.

Showing the Number, Mean, Standard Deviation, ‘t’ value and level of significance between control group VIII standard boys’ and girls’ scores of effectiveness of teaching mathematics by using teaching learning material.

Group	Test	N	Mean	S. D	‘t’ value	Level of significance
Experimental Group	Boys	20	13.650	4.847	0.973	Not Significant
	Girls	20	15.250	5.063		

The above table reveals that the obtained ‘t’ value of 0.973 is less than the ‘t’ table value of 2.02 at 0.05 level of significance with degrees of freedom 38, the value was not found significant. Hence the null hypothesis accepted that “there is no effectiveness of teaching

mathematics by using teaching learning material between experimental group VIII standard boys and girls.”

Hypothesis-4

There is no effectiveness of teaching mathematics between control and experimental group boys.

Table Showing the Number, Mean, Standard Deviation, ‘t’ value and level of significance between control and experiment group boys’ scores of effectiveness of teaching mathematics.

Group	Test	N	Mean	S. D	‘t’value	Level of significance
Boys	Control	20	10.350	4.556	2.218	Significant
	Experiments	20	13.650	4.847		

The above table reveals that the obtained ‘t’ value of 2.218 is greater than the ‘t’ table value of 2.02 at 0.05 level of significance with degrees of freedom 38, the value was found significant. Hence the null hypothesis rejected and an alternative hypothesis is formulated that “there is a effectiveness of teaching mathematics between control and experimental group boys.”

It can be also inferred from this that teaching of mathematics by using teaching learning material was affected in experimental group boys.

Hypothesis-5

There is no effectiveness of teaching mathematics between control and experimental group girls.

Showing the Number, Mean, Standard Deviation, ‘t’ value and level of significance between control and experiment group girls’ scores of effectiveness of teaching mathematics.

Group	Test	N	Mean	S. D	‘t’value	Level of significance
Girls	Control	20	11.200	5.063	2.415	Significant

	Experiments	20	15.250	5.533		
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The above table reveals that the obtained 't' value of 2.415 is greater than the 't' table value of 2.02 at 0.05 level of significance with degrees of freedom 38, the value was found significant. Hence the null hypothesis rejected and an alternative hypothesis is formulated that "there is a effectiveness of teaching mathematics between control and experimental group girls."

It can be also inferred from this that teaching of mathematics by using teaching learning material was affected in experimental group girls.

MAJOR FINDINGS OF THE STUDY:

The following are the major findings of the present study:

1. There is a effectiveness of teaching of mathematics by using teaching learning materials between control and experimental group VIII standard students.
2. There is no effectiveness of teaching of mathematics by traditional method between control group VIII standard boys and girls.
3. There is no effectiveness of teaching of mathematics by using teaching learning materials between experimental group VIII standard boys and girls.
4. There is a effectiveness of teaching of mathematics between control (traditional method) and experimental (using TLM's) group boys.
5. There is a effectiveness of teaching of mathematics between control (traditional method) and experimental (using TLM's) group girls.

CONCLUSIONS:

Based on the findings in this study, the following conclusions were drawn:

1. Students taught with Teaching Learning Materials achieved better than those taught without it.
2. There exists no significant difference in achievement of boys and girls mathematics students taught without Teaching Learning Materials (Traditional Method).
3. There exists no significant difference in achievement of boys and girls mathematics students taught with Teaching Learning Materials (Experimental Method).

4. There exists a significant difference in achievement of control and experimental group boys mathematics students taught.
5. There exist a significant difference in achievement of control and experimental group girls mathematics students taught.

EDUCATIONAL IMPLICATIONS

This study has provided data on the effectiveness of using TLMs teaching method in enhancing Achievement in Mathematics. This means that the use of Traditional method in the teaching of mathematics at secondary school level can address the poor performance. The study will helpful in designing appropriate instructional strategies involving Traditional method, which would enhance the learning of Mathematics. Mathematics teachers and education inspectors will identify this as an effective teaching method that would be suitable, to provide favorable learning conditions for all students rather than just for the top fraction of the class. And teacher educators will find the study useful in developing programs aimed at producing teachers capable of structuring learning environment that can equalize their interaction with learners enabling greater learner participation, satisfaction and further academic aspirations.

The following implications were made based on the finding of the study:

1. Mathematics teachers should use Teaching Learning Materials in teaching mathematics.
2. Government should establish Teaching Learning Materials in all schools.
3. Seminars/worships should be organized for mathematics teachers in secondary school on the use of Teaching Learning Material Materials.
4. Mathematics student teachers should be trained on the use of mathematics.

DELIMITAIONS OF THE STUDY

The study has certain delimitations as mentioned below

1. The study was confined only to Kannada medium VII standard students.
2. This study was limited to 80 students (40 students with Traditional Method and 40 Using Teaching Learning Materials)
3. The researcher has not developed any programme to develop Teaching Learning Materials.

4. The study was confined only to find out the effect of using of Teaching Learning Materials.
5. The present study was restricted to Government High School, Varthur, Bangalore only.
6. Statistical Technique like 't' test was only used.

SUGGESTIONS FOR FURTHER RESEARCH:

The findings of the study shall encourage, stimulate and provoke further research in the areas on interventions on written expression in English language. Based on the study a few suggestions are given below:

1. The study could be extended to the students of other standard students.
2. The study could be replicated on large sample.
3. Higher levels of statistical techniques like ANCOVA could be used.

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