



EFFECTIVENESS OF MATHEMATICS LAB IN LEARNING GEOMETRY AT STANDARD IX

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ABSTRACT

The study enlightens the effectiveness of Maths Lab in developing Geometry in Mathematics at standard IX. Conventional methods of acquiring knowledge in geometry are ineffective to the students . Challenging interactive Maths Lab can be helped to enhance the geometrical skills. The researcher endeavoured to prepare activities on Maths lab for enriching application oriented and life-long utilisation in Geometry for the students of standard IX. **Objectives of the study:** 1.To find out the significant difference in achievement mean score between the pretest of control group and the post test of control group.2.To find out the significant difference in achievement mean score between the Pre test of Experimental group and the Post test of Experimental group.4.To find out the impact of Maths Lab in learning Geometry. **Methodology:** Equivalent group Experimental method was adopted in the study. **Sample:** Sixty Students of standard IX from Thambu Higher Secondary school were selected as sample for the study.Thirty students were considered as Controlled group and thirty students were considered as Experimental group. **Tool:** Researcher's self-made achievement test was used as a tool for the study. **Validity** of the tool was established by the opinion of the juries. **Reliability** of the tool was established by the split-half method. Statistical technique:'t' test was used to analyse the study. **Findings:** Maths Lab is more effective than traditional methods in learning Geometry in Maths at standard IX. **Educational implications:** It can be implemented for improving Geometrical skills for other standards also.

KEYWORDS: Mathematics Laboratory, Experimental method, Conventional method, Geometry.

INTRODUCTION

Even though in the past, the importance of math education turned into downplayed for the most component as compared to philosophy and the like, in our cutting-edge world of virtual wizardly and gizmos, math bureaucracy the inspiration of every little component that learner do. That being stated, it's miles clear that the significance of arithmetic in training has heightened over the past years to glaring heights. And being a generation in which skill improvement and innovations are enormously regarded, the more mathematical approach embraced more successful.. The study enlightens the effectiveness of Maths Lab in Learning Geometry in Mathematics at standard IX.

REVIEW OF RELATED STUDIES

Paras Jain (2017) conducted a study of Impact of Mathematics Lab on School Students. **Objectives of the study:** 1. To find out physical availability of math lab in school. 2. To find impact of math lab on students of different classes. **Methodology:** The investigator adopted



survey method for the study. **Sample:** 300 students were selected as sample for the study. **Tool:** Researcher's self-made maths laboratory usage scale was used for the study. **Statistical Techniques:** Cumulative percent frequency, t- test, Mean, Standard deviation, one way Anova Correlation for impact, Split half reliability coefficient were employed for the study. **Findings:** The results of the present study revealed that the math lab influence student's performance, hypothesis there is no significant impact of math lab on student's performance among students of different class groups is rejected.

Manik Tembe (2017) conducted a study on developing mathematics laboratory for high school level. **Objectives of the study:** **1)** To bridge the gap between theory and practice of mathematics education. **2)** To define & develop the concept of 'Mathematics laboratory' in a broader sense based on the education theories like constructivism, activity based learning and treating mathematics as an empirical science. **3)** To write topic wise booklets about conceptual development of various topics from high school syllabus this will be useful to maths teachers and students. **4)** To collect and compile topic wise, math – lab activities. **5)** To make activity kits with card board, rubber sheets, plastic etc. **6)** To collect mathematical toys and games. **7)** To make work sheets with proper instructions for implementing the lab activities. **Findings:** The results of the present study revealed that the teaches in developing math lab in their schools and to shift from chalk board method of teaching maths to activity based teaching. Co – operative learning process can be initiated using the group projects and blending the stories and puzzles with the maths theory will make learning process lively, interactive and interesting.

NEED OF THE STUDY

Students of standard IX studying in Thambu Higher Secondary school,coimbatore had problems in learning Geometry. Conventional methods of teaching Geometry was not fruitful to achieve the expected scoring of marks of the learners in Mathematics. Conventional methods of Geometry at standard IX have been created monotony and reduced the interest of the learners. Hence the researcher endeavoured to Maths Laboratory for teaching and learning of Geometry and found out the effectiveness of the Maths Lab in the classroom among the selected students of standard IX.

STATEMENT OF THE PROBLEM

Students of standard IX studying in Thambu Higher Secondary school faced some problems to learn Geometry by using conventional teaching methods. Conventional methods did not enhance the competency of the learners in Geometry. Due to the problems of learning Geometry, many students failed to continue their studies in selected school for the study. Hence the Investigator adopted Maths Lab to eliminate the problems of bloomers and learners of Aided school.

Objectives of the study: 1.To find out the problems of conventional methods in learning Geometry.2.To find out the significant difference in achievement mean score between the pre test of control group and the post test of control group.3.To find out the significant difference in achievement mean score between the pre test of Experimental group and the post test of Experimental group.4.To find out the impact of Maths Lab in learning Geometry at standard IX.

Hypotheses of the study:1.Learners of standard IX have problems in learning Geometry in Maths by using conventional methods. 2. There is no significant difference in achievement mean score between the pre test of control group and the post test of control group. 3. There is no significant difference in achievement mean score between the pre test of Experimental group and the post test of Experimental group. 4. Mathematic Laboratory is more effective than conventional methods in Learning Geometry at standard IX.

Variables

The independent variables namely Maths Lab and the dependent variable namely achievement score were used in the study.

DELIMITATIONS OF THE STUDY

The responsibility of the researcher is to see that the study is conducted with maximum care in order to be reliable. However, the following delimitations could not be avoided in the present study. 1. The study is confined to 60 students of standard IX studying in Thambu Higher Secondary school ,Coimbatore. 2 .The study is confined to learning Geometry of the state board text book of Tamilnadu.

METHODOLOGY:

Parallel group Experimental method was adopted in the study. **Sample:** Sixty pupils of studying in standard IX from Thambu Higher Secondary school ,Coimbatore were selected as sample for the study. Thirty students were considered as Controlled group and another thirty were considered as Experimental group. **Tool:** Researcher's self-made achievement test was used as a tool for the study. An achievement test consisted of five questions

CONSTRUCTION OF TOOLS:

The investigator's self made Achievement test was used for the pretests and post tests of both control groups and experimental groups. The same question was used for both pre and post tests to evaluate the pupils' skills on drawing Geometry through subjective types of question which carried ten mark for each question and contained 50 marks.

Pilot study

In order to ascertain the feasibility of the proposed research and also the adequacy of the proposed tools for the study a pilot study had been undertaken. During the pilot study, the problem under study had been finely tuned. Sufficient number of model question papers were prepared and distributed to 10 students of standard IX in Thambu Higher Secondary school ,Coimbatore for the pilot study. This exercise was repeated twice over two sets of 10 students each. The clarification raised by the students was cleared then and there and the filled answer scripts were collected by the researcher. These students were selected in such a way that they were not part of either the control group or experimental group.

Reliability of the tool

A test is reliable if it can be repeated with a similar data set and yields a similar outcome. The expectation of a good research is that it would be reliable. It refers to the trustworthiness or consistency of measurement of a tool whatever it measures. Under this study the reliability had been computed using split-half method and the calculated value comes to 0.84. The value is quite significant and implies that the tools adopted were reliable. Hence the reliability was established for the study.

Validity of the tool

The concept of validity is fundamental to a research result. A result is internally valid if an appropriate methodology has been followed in order to yield that result. A test is said to be valid if it measures what it intends to measure. The expert opinion of the co staff was obtained before freezing the design of the tools. Subject experts and experienced teachers were requested to analyse the tool. Their opinions indicated that the tool had content validity.

Procedure of the study: 1.Identification of the problem by administering pre-test to the both groups. 2. Planning. 3. Preparation of activities. 4. Execution of activities through Maths lab.5.Administering post-test.

Data collection:

The researcher administered pretest to the pupils with the help of the teachers. The question paper and response sheets were given to the individual learners and collected and evaluated learning obstacles of the learners were identified by the pretest. The causes of low achievement by unsuitable methods were

found out. Maths Lab was used to learning Geometry for one week. The posttest was administered and the effectiveness of the Maths Lab was found.

Data analysis

Statistical technique t test was applied for the study.

HYPOTHESIS TESTING

Hypothesis 1:

Learners of standard IX have problems in learning Geometry in Maths by using conventional methods.

In the pre-test, students score 20% marks in learning Geometry through conventional methods and the Experimental group students score 70% marks. It shows that Students of standard IX have problems in learning geometry in Mathematics at Thambu Higher Secondary School ,Coimbatore.

Hypothesis 2:

There is no significant difference between the Pret test of control group and Post test of control group in achievement mean scores of the pupils in learning Geometry in Maths at standard IX in Thambu Higher Secondary School ,Coimbatore

Table -1
The table showing achievement mean scores between pre test of control group and posttest of Control group.

Test	N	Mean	S.D.	df	t- value	Level of significance
Pretest control group	30	46.50	4.45	58	1.72	P<0.05
Post test control group	30	47.30	4.48			

The calculated 't' value is (1.72) less than table value (1.96). Hence null hypothesis is accepted at 0.05 levels. Hence there is no significant difference between the pre test of control group and post test of control group in achievement mean scores of the learners in learning Geometry by conventional methods in Maths.

Hypothesis 3:

There is no significant difference between the Pre test of Experimental group and Post test of Experimental group in achievement mean scores of the students in learning Geometry in Mathematics.

Table-2
The table showing achievement mean scores between pretest of Experimental group and posttest of Experimental group.

Test	N	Mean	S.D.	df	t- value	Level of significance
Pretest Experimental group	30	52.43	5.07	58	22.87	P>0.05
Post test Experimental group	30	86.78	6.72			

The calculated 't' value is (22.87) greater than table value (1.96). Hence null hypothesis is rejected at 0.05 levels. Hence there is significant difference between the pre test of Experimental group and post test experimental group in achievement mean scores of the learners of Maths in Geometry.

Hypothesis 4.

Learning Geometry by using Maths Lab is more effective than existing methods.

Achievement mean scores of the learners in post-test of control group is 47.30 and the achievement mean scores of the learners post test of Experimental group is 86.78. Score of the post test of Experimental group (86.78) is greater than Pre test of Experimental group (52.43) It shows that learning Geometry by using Maths Lab is more effective than conventional methods

Findings:

1. In the pre-test, students score 20% marks in learning Geometry through conventional method and the Experimental group students score 70% marks. It shows that Students of standard IX, Thambu Higher Secondary school, Coimbatore have problems in learning Geometry through conventional method.
2. There is no significant difference between the Pre test of control group and Post test control group in achievement mean scores of the pupil of standard IX in learning Geometry through Maths Lab at Thambu Higher Secondary school, Coimbatore
3. There is significant difference between the Pre test of Experimental group and Post test of Experimental group in achievement mean scores of the pupils in learning geometry.
4. Learning Geometry in Maths by using Maths lab gave significant improvement.

EDUCATIONAL IMPLICATIONS

1. Using Maths Lab can be used for learning different subjects and it can be extended to primary level, secondary level and higher secondary level.
2. It can be encouraged to implement to use in adult education
3. It may be implemented in teachers education
4. It may be implemented in alternative school
5. Slow learners can be improved by using it
6. It may be more supportive to promote Sarva Siksha Abiyan in grass root level.

CONCLUSION

The study reveals that Students of standard IX in Thambu Higher Secondary school, Coimbatore had problems in learning Maths through conventional methods but Learning Geometry in Maths through Maths lab is more effective than conventional methods. Hence it will be more supportive to enrich Geometry in Maths at standard IX,

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