

EFFECTIVENESS OF TEACHING GRAPHS IN MATHEMATICS THROUGH MULTIMEDIA INTERACTIVE BOARD: TECHNOLOGY - A CATALYST IN THE LEARNING PROCESS

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Abstract: The study aims at evaluating the effectiveness of teaching graphs in mathematics through Interactive white board and also to find the differences between teaching graphs in mathematics through Interactive white board and through conventional method of teaching. Day by day the access to the information is increasing, as well as the information access of the students is also increasing gradually. There is an urgent need to orient on new information to the students community in a short period of time made new technologies a requirement to be used in education. Because of this reason, the teachers are searching for new ways that they can teach more efficiently and get benefit from the educational technologies to make students learn more easily. Significant differences were noted between the experimental group and the control group and also significant differences found between boys and girls. Results indicate that use of the interactive whiteboard as an instructional tool has a beneficial effect on the student's learning level in Mathematics.

Keyword: Graphs , Mathematics , Interactive Board.

INTRODUCTION

Nowadays, just chalk and board are not enough to attract attention of the students who are intensely exposed to external stimulus like television and computer. In the presence of a changing society, the only way to provide more effective education is redesigning teaching and learning processes systematically and using human and technological resources mutually by integrating learning and communication (Reiser, 1987).

Utilization of Whiteboard Technology in Education:

An interactive whiteboard (IWB), is a large interactive display that connects to a computer. A projector projects the computer's desktop onto the board's surface where users control the computer using a pen, finger, stylus, or other device. The board is typically mounted to a wall or floor stand. They are used in a variety of settings, including classrooms at all levels of education, in corporate board rooms and work groups, in training rooms for professional sports coaching, in broadcasting studios, and others.

RATIONAL FOR THE STUDY:

Graphs are mathematical expression which used to display information visually. They can show very quickly concepts that would need very lengthy written descriptions. Graphs take many forms. There are bar graphs, pie charts, and line graphs. This study will show students how art can be combined with other subjects, in this case math, to produce graphs. The graph of a function is really useful if we are trying to model a real-world problem. The graph can give us a good idea of what function may be applied to the situation to solve the problem.

Since computers entering into education environment, advances in technology used in classes increase without any slowdown. One of these developments is "the interactive whiteboard technology" that becomes more and more prevalent in our country in recent

years (Shenton & Pagett, 2007). Consequently, students who do not attend to lessons can follow topics (Becta, 2003). Interactive white board can also be used in increasing students' information communication skills, thinking skills, software utilization skills, and general learning skills such as note-taking and note preparation, Interactive white board technology increases students' interest in searching information on internet and processing information (Hodge et al., 2007).

Interactive-White Board (IWB) is suitable for learners of all ages and allows them to work collaboratively. It looks and can work like a conventional-whiteboard. Thus it maintains the familiarity one has with the traditional-whiteboard.

It is a better option than a computer monitor when it comes to classroom presentation. While through a PC only limited number of students can be given presentation at a time, with IWB entire class can be covered very easily as it is much bigger in size. Therefore, keeping the importance and utility of Interactive-White Board (IWB), the present study is attempted to find out its effectiveness in teaching graphs in mathematics to students.

OBJECTIVES:

1. To find out the effectiveness of teaching graphs in mathematics through Interactive white board over conventional method of teaching.
2. To find out the difference in the scores of graph test of the boys in both the experimental group and the control group.
3. To find out the difference in the scores of graph test of the girls in both the experimental group and the control group.

Hypothesis:

1. There is no significant mean difference between the control group and experimental group in their post-test scores.
2. There is no significant difference in the scores of graph post-test of boys in both the experimental group and the control group.

3. There is no significant difference in the scores of graph post-test of girls in both the experimental group and the control group.

Method:

The design chosen for the present study is "Post test- only control group design" is a pre experimental design for the investigation. It is regarded as the most accurate form of experimental research, in order to prove or disprove a hypothesis mathematically, with statistical analysis.

Post-Test Only Control Group Design:

This design follows all the same steps as the classic pre-test/post-test design except that it omits the pre-test. The students are randomly assigned to two groups of 26 each. The experimental (treatment) group received a new teaching method through an interactive white board. The second group (the control) received a traditional teaching method. No pretest is used for each group. Issues such as existing grades, mid-term scores, and other factors are examined as covariates. Symbolic view of the model is as follows:

Experimental Group :RX01

Control Group : R02

SAMPLE OF THE STUDY:

The researcher has chosen the sample of 52 students of class 8th standard which includes two sections of 26 students in each from Sri SaiVidhyalayaHr.Sec., School atkalyannagar, Bangalore. The sample included both boys and girls. The researcher took the mid-term marks of these two sections of students to equate initially. With a flip of a coin, one section was selected as control group and the other as an experimental group. The experiment was conducted by the researcher after ensuring that there was no significant difference in the mean scores of the midterm achievement scores between the groups.

Tools:

1. The marks scored by the students in their mid-term test have been used as one of the tools to collect data regarding the pupil's academic achievement.
2. Power Point presentations with study material software designed by the researcher on the selected topic (Introduction of graphs, plotting of points, its application and Linear equations" taken from common education text book of 8th standard).
3. Post test to assess the achievement of students on the selected topic was developed by the researcher.

Development of treatment material for Interactive-White Board(IWB):

The material was developed with the help of the experienced school teachers, and subject teachers of the class 8th. The investigator sought the expert guidance given by the teachers in the school where the experiment was conducted, adds to the validity of the tool.

Analysis And Interpretation Of The Data:

The research work is complete when it has valid

statistical inferences. It proves the findings related to the stated problem. It also provides the evidences for a study that, it has proved its worth by finding out the significance of the different variables used in the research work. The meaningfulness of data derives from the clarity with which one specifies the problem or questions being addressed and the precision with which pertinent information is gathered. Hypotheses formulated in the study were tested and testing of each of the hypothesis was done on the basis of the results obtained through analysis of the data.

Hypothesis: 1:

Table 1: Showing post-test scores between Experimental & control Group:

| Group | N | Mean | Std. Deviation | Std. error Mean | t | Level of significance |
|-------|--------------|------|----------------|-----------------|-------|-----------------------|
| Pair | Experimental | 26 | 66.7778 | 15.70643 | 2.171 | * |
| | Control | 26 | 58.5556 | 16.67581 | | |

*= Significant at 0.05 level of probability.

The above table shows that the calculated t-value between the Experimental and control group is higher than the table value at 0.05 level of significance. Hence there is a significance difference in the achievement of experimental and control group in post-test.

Hypothesis-2:

Table 2: Showing post-test scores of Boys between Experimental & control Group:

| Group | N | Mean | Std. Deviation | Std. error Mean | t | Level of significance |
|-------|--------------|------|----------------|-----------------|-------|-----------------------|
| Boys | Experimental | 13 | 65.1111 | 9.87504 | 2.695 | * |
| | Control | 13 | 54.0000 | 13.80537 | | |

*= Significant at 0.05 level of probability.

The above table shows that the calculated t-value of Boys between Experimental and control group is higher than the table value at 0.05 level of significance. Hence there is a significance difference in the achievement of boys of experimental and control group in post-test.

Hypothesis-3 :

Table 3: Showing post-test scores of Girls between the Experimental & control Group:

| Group | N | Mean | Std. Deviation | Std. error Mean | t | Level of significance |
|-------|--------------|------|----------------|-----------------|-------|-----------------------|
| Girls | Experimental | 13 | 74.6667 | 15.92630 | 2.231 | * |
| | Control | 13 | 61.2222 | 18.73831 | | |

*= Significant at 0.05 level of probability.

The above table shows that the calculated t-value of Girls between the Experimental and control group is higher than the table value at 0.05 level of significance. Hence there is a significance difference in the achievement of girls of experimental and control group in post-test.

DISCUSSION OF THE RESULT :

The summary of the results of mean scores of Experimental and Control group post-test is given in the above tables.

It is inferred from table 1, 2 & 3 that the calculated 't' value between the experimental and control group, boys of experimental and control group and girls of experimental and control group respectively, with respect to their achievement in post-test is higher than the table value at 0.05 level of significance. Hence there is a significance difference in the achievement of learning graph in Mathematics between the experimental and control group, boys of experimental and control group and girls of experimental and control group in post-test.

Similar results were also found by Sunil Nagore (2008), the experimental group taught through multimedia instruction was more successful than the control group taught through traditional method., Raja Harikrishnan (2009), students taught through multimedia smart board found to be more successful in the attainment of learning line-graph and sector-graph.

It is evident that, by using Multimedia in classroom has a greater significance in making most of the abstract things which can be very well dealt with media and other related accessories.

EDUCATIONAL IMPLICATIONS:

Mathematics teaching can be made more interesting through a variety of sensory experiences than through mere talk and chalk method. The use of audio-visual aids provides a variety of sensory experiences which will help in making abstract mathematical concepts concrete and meaningful. Moreover, it facilitates better understanding of the subject and thereby makes it more interesting. It arouses the intellectual curiosity of the students and helps to maintain interest in the subject.

A mathematics teacher should be well versed with the means and techniques of arousing and stimulating interest in mathematics. However, a teacher can always devise techniques which are most appropriate for his own students.

Students become interested in things which are new and exciting though the possession of background information related to the new work tends to intensify the interest, novelty is more compelling than familiarity. The mathematics learning should arouse the curiosity of the students; should satisfy their thirst for knowledge and should help in appreciating the beauty of mathematics. The teacher has to arrange the mathematics activities in a manner most suitable for the students; level of understanding.

A resourceful teacher can think of many more such devices which are specially suitable for the students whom he teaches. However, selection of the devices should be guided by the level of achievement, the intellectual maturity of the students as well as attitude and aptitude of the students. Above all, the teacher himself should be highly motivated to teach mathematics with a high level of interest in the subject. Only such teachers could inculcate interest in the students and enthrust them to learn.

CONCLUSION:

Computers are entering into our educational field, with the advances in technology used in classes to increase the pace of learning. "the interactive whiteboard technology" that is becoming more and more prevalent even in our country in recent years, can also be used in increasing students' information communication skills, thinking skills, software utilization skills, and general learning skills such as notes-taking and notes preparation.

Hence, the use of Multimedia Interactive board can have a greater influence on the achievement in learning graphs in mathematics. As the programme includes audio, video, animation graphing which create more interest to the students and helps them to learn more. This lay emphasis that multimedia teaching is effective than the traditional method.

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