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A Study of Effectiveness of Computer Aided Instructional program on Maths for Gujarati Medium Students of Standard IX

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Abstract

The present experimental study was conducted to find out effectiveness of CAI program on Maths for gujarati medium students of standard IX. The investigator used purposive sampling methods for selecting sample. The effectiveness was measured by taking 150 students as sample using single group pre-test and post-test. After conducting experiment reactions of students and Maths teacher were collected using reaction scale. The descriptive statistical technique like mean, standard deviation and t-test was used to analyse the data. The study found that CAI program is effective for learning concept of Maths and positive reactions are found towards CAI program of students and Maths teacher.

Keywords: *Achievement, Maths subject Computer Assisted Instructional Material, Effectiveness*

1. Introduction

Today at the secondary level lecture method is widely used. But, this method is not effective for explaining abstract concepts of maths. There is a need of using different media for providing effective instruction. Computer is one of the effective media. It can present a wide variety of stimuli through graphics, text, colors and sound in a most friendly manner. Animation makes the instructional material quite interesting. Computer has a potential to enhance teaching-learning process and the nature of maths subject is such that it makes it possible to use computer for instructional purpose. The maths subject deals with abstract concepts, figures, and diagrams. This was easily explained by use of computer because computer has a potential to present effective instruction through combination of graphics, text, colors, sound, 3-D pictures, animation etc.

One of the ways for providing effective instruction through computer is CAI program. Computer aided instructional Material (CAI program) is totally an individualized instructional material. CAI program provides a lot of flexibility to the students. The student can take his own time to learn. The student can choose content, sequence and the difficulty level of the instruction that they requires. The computer becomes an interesting interactive medium. The topic of the study “selective topics of maths” also has abstract nature. It required imagination about “selective topics of maths”. 2-D figures given in the text book do not form proper concept in the minds of students. Here, CAI program helps the students through animation, 3-D figures, and moving objects for making concept clear. From review of related literature the

investigator found that CAI program is an effective way providing instruction and it increases the achievement of students. So the investigator found that there is a need of preparing CAI program on maths for Gujarati medium by using power point package. All these reasons inspired the investigator to take up this study.

2. Objectives of the Study

1. To develop Computer Aided Instructional Material in Maths on "selecative topics of maths" for standard IX.
2. To study the effectiveness of CAI program in terms of achievement of students.
3. To study the reaction of the students towards the effectiveness of CAI program.

3. Null Hypothesis

Ho1 There will be no significant difference in the mean gain scores of students on pre-test and post-test.

4. Operational Definition of terms

4.1 CAI program

CAI program is a programmed learning material which provides instruction through computer.

4.2 Achievement

Here, achievement means the marks obtained by the students in the pre-test and post-test conducted on "selective topics of maths" for Gujarati medium students of standard IX.

4.3 Effectiveness

Here, effectiveness of CAI program is measured in terms of the difference of mean gain scores of the students on post-test and pre-test.

5. Delimitation of the Study

The present study has been delimited to one of the Gujarati medium secondary school having computer lab facility at Rajkot city. It is further delimited to one topic, i.e., selective topics of maths from Standard IX maths text book following GSEB syllabus.

6. Population

All Gujarati medium secondary schools having computer lab facility of Rajkot city will constitute the population for the present study.

7. Sample

One school was selected purposively from all the Gujarati medium secondary schools having computer lab facility of Rajkot city. It fulfilled the following requirement for the present study.

- ✓ A minimum one computer with LCD projector
- ✓ Networking of all Computers
- ✓ Availability of Microsoft Power Point software
- ✓ Easy access of Computer laboratory to students

All the 150 students from 'A' section of standard IX of the selected school constituted the sample for the study.

8. Tools

The following tools were constructed by considering objectives of the study.

9. Development of CAI program

The CAI program on "selective topics of maths" for Gujarati medium students of standard IX was constructed by investigator. First the topic of "selective topics of maths" was selected and further content analysis was done. The content was converted into small teaching points. All these teaching points were logically and sequentially arranged according to the content requirement figures, 3-D pictures was downloaded from the different Maths websites.

After collecting all the required information CAI program was constructed by following programmed learning material steps and using Microsoft Power point package. The CAI program was validated by experts in the field of education. A pilot study was conducted on a set of students who do not constitute the sample, to check the time required and instruction needed by the students.

9.1 Achievement Test

The achievement test was constructed by the investigator. The achievement test was used as pre-test and post-test for measuring achievement of students. The test was validated by experts in the field of education. A pilot study was conducted on a set of students who did not constitute the sample to check the time required by the students.

10. Data Collection

The investigator was personally visited the principal of the school with an authority letter from the university authorities stating the purpose of the study. After getting the principal's approval for date and time for conduct study. First pre-test was administered then immediately CAI program was administered and post-test was administered one day after implementation of CAI program.

11. Data Analysis and Interpretation

The data obtained through pre-test and post-test were analyzed quantitatively using correlated t-test.

The investigator has formulated a null hypothesis for testing effectiveness of CAI program. For testing the hypothesis pre-test and post-test, were administered. The data were analysed with the help of correlated t-test. The hypothesis was tested at 0.01 level.

Table 1 The calculated Pre-test and Post-test means, standard deviations (SDs) and t-value for the experiment

Expirement	Group	Sample number	Mean	S.D.	t-value
I	Experiment	25	37.12	5.07	3.89
BOYS	Control	25	29.44	8.46	
II	Experiment	25	39.44	9.01	4.96
GIRLS	Control	25	34.64	14.33	
III	Experiment	25	24.80	66.17	7.42
MIX	Control	25	12.08	7.24	

Table 2 The calculated Pre-test and Post-test means, standard deviations (SDs) and t-value for the replication

Experiment	Group	Sample number	Mean	S.D.	t-value
I	Experiment	25	23.88	85.61	7.94
BOYS	Control	25	8.68	5.86	
II	Experiment	25	28.08	63.58	8.69
GIRLS	Control	25	12.92	12.41	
III	Experiment	25	28.12	51.38	10.41
MIX	Control	25	12.16	7.39	

From the table - 1 result shows that In the Experiment I calculated value of 't' is 3.89. The calculated' value is significant at 0.01 level because the calculated value of 't'. i.e., 3.89 is greater than the table value at 0.01 level of significance, i.e 2.67 . So, the null hypothesis that there will be no significant in the mean gain scores of students on pre-test and pot-test is rejected. From this it can be concluded that there is a significant difference in the mean gain score of students on pre-test and post-test. It can also be observed form the Table - 1 that mean gain score on post-test is greater than the pre-test mean gain score. It can be attributed to learning through the CAI program.

. From the table - 1 result shows that In the Experiment II calculated value of 't' is 4.96 The calculated' t value is significant at 0.01 level because the calculated value of 't'. i.e., 4.96 is greater than the table value at 0.01 level of significance, i.e. 2.67 . So, the null hypothesis that there will be no significant in the mean gain scores of students on pre-test and pot-test is rejected. From this it can be concluded that there is a significant difference in the mean gain score of students on pre-test and post-test. It can also be observed form the Table - 1 that mean gain score on post-test is greater than the pre-test mean gain score. It can be attributed to learning through the CAI program

From the table - 1 result shows that In the Experiment III calculated value of't' is 7.42 The calculated 't value is significant at 0.01 level because the calculated value of 't', i.e., 7.42 is greater than the table value at 0.01 level of significance, i.e. 2.67 . So, the null hypothesis that there will be no significant in the mean gain scores of students on pre-test and pot-test is rejected. From this it can be concluded that there is a significant difference in the mean gain score of students on pre-test and post-test. It can also be observed form the Table - 1 that mean gain score on post-test is greater than the pre-test mean gain score. It can be attributed to learning through the CAI program

From the table - 2 result shows that In the Experiment I calculated value of't' is 7.94. The calculated t' value is significant at 0.01 level because the calculated value of 't'. i.e.,7.94 is greater than the table value at 0.01 level of significance, i.e. 2.67 . So, the null hypothesis that there will be no significant in the mean gain scores of students on pre-test and pot-test is rejected. From this it can be concluded that there is a significant difference in the mean gain score of students on pre-test and post-test. It can also be observed form the Table - 2 that mean gain score on post-test is greater

than the pre-test mean gain score. It can be attributed to learning through the CAI program

From the table - 2 result shows that In the Experiment II calculated value of‘t’ is 8.69. The calculated’ value is significant at 0.01 level because the calculated value of ‘t’. i.e., 8.69 is greater than the table value at 0.01 level of significance, i.e. 2.67 . So, the null hypothesis that there will be no significant in the mean gain scores of students on pre-test and pot-test is rejected. From this it can be concluded that there is a significant difference in the mean gain score of students on pre-test and post-test. It can also be observed form the Table - 2 that mean gain score on post-test is greater than the pre-test mean gain score. It can be attributed to learning through the CAI program

From the table - 2 result shows that In the Experiment III calculated value of‘t’ is 10.41. The calculated’ value is significant at 0.01 level because the calculated value of ‘t’. i.e., 10.41 is greater than the table value at 0.01 level of significance, i.e. 2.67 . So, the null hypothesis that there will be no significant in the mean gain scores of students on pre-test and pot-test is rejected. From this it can be concluded that there is a significant difference in the mean gain score of students on pre-test and post-test. It can also be observed form the Table - 2 that mean gain score on post-test is greater than the pre-test mean gain score. It can be attributed to learning through the CAI program

12. Findings

- CAI program was found to be effective for teaching-learning.
- CAI program was helpful to understand abstract concept like “selective topics of maths”.
- CAI program was helpful for increasing interest of students in Maths.
- The use of moving objects in CAI program increased the effectiveness.
- The reactions of students and teacher were found positive towards CAI program.

13. Suggestions for the Further Study

The areas and variables that are not covered in the present study may be taken for further study.

- To develop CAI program by taking all the chapters of Maths of standard 11.
- To develop CAI program by taking Maths of standard 12.
- To develop CAI program in all other subjects of science stream.
- To develop CAI program in all other stream, i.e., Arts and Commerce.
- CAI program may be developed by using branching programming.
- CAI program may be developed by using other computer software.

14. EDUCATIONAL IMPLICATION OF THE PRESENT STUDY

Students enjoyed learning mathematics through CAI and it helped students as a supplementary material. Self learning material should be developed in mathematics where ever possible for all classes and should be used along with the conventional method to make learning enjoyable pleasant experience.

15. CONCLUSION

The results of this study indicate that class IX students learned mathematics equally well with CAI program. The all student of experiment group was gain score higher than all student of control group. So that CAI program was fruitful to good achievement score. Computers have the potential to be useful tools to improve learning; however, it is the responsibility of the teachers to choose software that meets the needs of the students, to use it effectively, and to require its use. Educators can tap into this interest by using technology to deliver instruction and assess learning. Computer learning systems provide educators the opportunity to create lessons in a variety of alternative formats to the traditional lecture in order to represent the different learning strategy and preferences of students. This supplement is also useful to the students whenever they are absent to the class during the content is taught. They can refer repeatedly until they understand thoroughly this facility is absent in the traditional method. Ultimately quality is essential in any mode of instruction. There is also limitations in preparing CAI program person should know not only the content but also methods to prepare CAI program.

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