
Preparation and Testing of Computer Assisted Model for Learning Mathematics at Secondary Level

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Computer-assisted instruction (CAI) programs are considered as a way to improve learning outcomes of students. However, little is known on the schools who implement such programs as well as on the effectiveness of similar ICT – programs. We provide a literature review which pays special attention to the existing causal evidence of computer - assisted programs on learning outcomes. The results suggest that schools with lower educational attainments use more frequently computer - assisted instruction programs. This suggests that they use CAI - programs to catch - up on learning outcomes. Working with a CAI – program seems therefore effective.

Keywords: Computer, Learning, Mathematics, Education and Achievement.

Introduction

“Education either function as an instrument which is used to facilities integration of the younger generation into the logic of the present system and bring about conformity or it becomes the practice of freedom, the means by which men and women deal critically and creatively with reality and discover how to participate in the transformation of their world”. Computer assisted instructions (CAI) are given procedures or steps provided by means of a computer to perform a certain action or solve a problem. This is a form of education that was introduced in the 1960’s and can be done by either by straight presentation of data or in form of question and answer

The use of computers in education started in the 1960s.with the advent of convenient microcomputers in the 1970s, computer use in schools has become widespread from primary education through the university level and even in some preschool programs. Instructional computers are basically used in one of two ways: either they provide a straightforward presentation of data or they fill a tutorial role in which the student is tested on comprehension.

If the computer has a tutorial program, the student is asked a question by the computer; the student types in an answer and then gets an immediate response to the answer. If the answer is correct, the student is routed to more challenging problems; if the answer is incorrect, various computer messages will incident the flaw in procedure, and the program will bypass more complicated questions until the student shows mastery in that area.

There are many advantages to using computers in educational instruction. They provide one-to-one interaction with a student, as well as an instantaneous response to the answer elicited, and allow students to proceed at their own pace. Computers are particularly useful in subjects that require drill, freeing teacher time from some classroom tasks so that a teacher can devote more time to individual students. A computer program can be used diagnostically, and, once a student's problem has been identified, it can then focus on the problem area. Finally, because of the privacy and individual attention afforded by a computer, some students are relieved of the embarrassment of giving an incorrect answer publicly or of going more slowly through lessons than other classmates.

Need and Significance of the Study

The educational capacity of the student is judged by his achievement in the school. The academic performance in school subjects will lead them to choose the future course of life. In the high school level itself the basic things will be known by the students. This is an important stage not only for studying habits influencing the academic achievement, but also to bear on the whole personality of the school students. The investigator would like to know, 'Is there any relationship between parent's behaviour on the child's adjustment and academic achievement of the School students?'. The knowledge of the relationship between these variables under study would help the parents and students to make the needed changes.

Understanding the relationship between parent's behaviour on the child's adjustment and his academic achievement will be of great importance in determining the interrelation between the variables under study. The results of the present study will be useful to understand the fact, whether parent – child relationship has greater impact on the child's adjustment and academic outcome of the students. The findings can be utilized in the field of education to develop remedial measures, favourable relationship between the parent and the child which in turn will help the high school students. As a result, healthier school community, society and the nation will be formed.

Information is presented in a structured form. It proves useful in the study of a subject where there is hierarchy of facts and rules. CAI forces active participation on the part of the student, which contrasts with the more passive role in reading a book or attending a lecture. CAI utilizes a responding system that provides the student with a clear of his progress.

Thus, students can identify the subject areas in which they improve and in which they need improvement. By enabling student to manipulate concepts directly and explore the results of such manipulates, it reduces the time taken to comprehend difficult concepts. CAI offers a wide range of experience that are otherwise not available to the student. It works as multimedia providing audio as well as visual inputs. It enables the student to understand concepts clearly with the use of stimulating techniques such as animation, blinking, graphical displays etc.

Objectives of the Study

- To prepare the Computer Assisted Model (CAM) for learning mathematics in standard IX
- To test whether there is any significant difference between control group and experimental group with regard to pre-test.
- To test whether there is any significant difference between control group and experimental group with regard to post-test.
- To test whether there is any significant difference between Pre-test and Post-test achievement scores of control group.
- To test whether there is any significant difference between Pre-test and Post-test achievement scores of experimental groups.

Hypotheses of the Study

- There will be significant difference between experimental (computer assisted model) group and control (active model) group method with regard to achievement scores when the treatment groups are exposed to experimental teaching. (Total sample)
- There will be significant difference between the pre- test achievement scores of male and female students in the control group.
- There will be significant difference between mean of post-test achievement scores male students of computer assisted model group and activity method group.
- There will be significant difference between Difference between means of post-test achievement scores of BC and MBC students of computer assisted model group.
- There will be significant difference among means of post-test achievement scores of students of computer assisted model group based on father's qualification.

Method used for the Present Study

The investigator has used experimental method to preparation and testing of computer assisted model for learning mathematics at secondary level.

Population & Sample

For the investigation of standard students were selected from Sree Krishna Hindu Vidyalaya Matric. Hr. Sec. School, Kanchinagar, Kanyakumari District as the sample. The sample of 60 students selected for the study.

Analysis of Data

H1: There will be significant difference between experimental (computer assisted model) group and control (activity model) group method with regard to achievement screen when the treatment groups were exposed to experimental teaching.

The obtained value of $F_1 F_x = 11.656$ and $F_y = 34.724$ is greater than F at 0.05 level and 0.01 level, it can be concluded that the groups (I & II) differ significantly w.r.to pre-test and post- test achievement scores.

H2: There will be significant difference between the pre – test achievement scores of male and female students in the experimental group

Table - 1

Difference between means of pre-test and post-test achievement scores of computers assisted model group and activity model group.

| S. No | Source of variance | df | SS _x | SS _y | MS _x | MS _y |
|-------|--------------------|----|-----------------|-----------------|-----------------|-----------------|
| 1 | Among groups | 1 | 384 | 510.41 | 384 | 510.41 |
| 2 | Within groups | 58 | 1910.734 | 852.574 | 32.943 | 14.699 |
| | Total | 59 | 2294.734 | 1362.984 | 416.943 | 525.109 |

Table - 2

Difference between means of post-test achievement scores male and female students of computer assisted model group

| S. No | Gender | Number of students | Mean | Variance | 't' value | Level of significance |
|-------|--------|--------------------|--------|----------|-----------|-----------------------|
| 1 | Male | 8 | 46.625 | 3.125 | 1.944 | Not Significant |
| 2 | Female | 28 | 48.136 | 4.694 | | |

It is evident from table 2 that there is no significant difference between male and female students with regard to post – test achievement scores of computers Assisted method group ($t = 1.944$; $p > 0.05$)

H3: There will be significant difference the male students of control group and experimental group in their post – test achievement scores

Table - 3

Difference between mean of post-test achievement scores male students of computer assisted model group and activity method group

| S. No | Group | Number of students | Mean | variance | 't' value | Level of significance |
|-------|--------------------|--------------------|--------|----------|-----------|-----------------------|
| 1 | Control group | 16 | 38.875 | 19.716 | 6.083 | Significant |
| 2 | Experimental group | 8 | 46.625 | 3.125 | | |

It is evident from table 3 that there is significant difference between male students with regard to post –test achievement scores of computers assisted model group and activity method group ($t = 6.083$; $p < 0.01$)

H4: There will be significant between the community of students with difference regard to post – test achievement scores when the group is experimental teaching.

Table - 4

Difference between means of post-test achievement scores of BC and MBC students of computer assisted model group

| S. No | Community | Number of students | Mean | Variance | 't' value | Level of significance |
|-------|-----------|--------------------|--------|----------|-----------|-----------------------|
| 1 | BC | 28 | 47.928 | 3.698 | 0.969 | Not significant |
| 2 | MBC | 2 | 45 | 18 | | |

It is evident from table 4 that there is no significant difference between BC and MBC students with regard to post – test achievement scores of computers Assisted model group ($t = 0.969$; $p > 0.05$).

H5: There will be significant difference among the post-test achievement scores of students in the Experimental group based on the qualification of father.

Table - 5

Difference among means of post-test achievement scores of students of computer assisted model group based on father's qualification.

| S. No | Father's educational status | Number of students | Mean | Variance | 'F' value | Level of significance |
|-------|-----------------------------|--------------------|--------|----------|-----------|-----------------------|
| 1 | SSLC | 15 | 47.666 | 4.380 | 0.063 | Not Significant |
| 2 | HSC | 4 | 47.5 | 3.666 | | |
| 3 | Graduate | 11 | 47.909 | 6.090 | | |

The table 5 shows that calculated f value (0.063) is less than F critical value (3.354) at 5% level of significance. Hence it can be concluded that there is no significance among students based on father's qualification (SSLC, higher secondary, graduate) with regard to post – test achievement scores.

Finding

- There is no significant difference between the pre- test achievement scores of male and female students in the control group.
- There is significant difference between mean of post-test achievement scores male students of computer assisted model group and activity method group

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- There is no significant difference between Difference between means of post-test achievement scores of BC and MBC students of computer assisted model group
 - There is no significant difference among means of post-test achievement scores of students of computer assisted model group based on father's qualification.

Educational Implications

The findings of the study will be useful to develop innovative models and methods of teaching different subjects. The study can be used to collected details about the methods of teaching commerce using concept maps. It can be used to develop various skill and capabilities in students at different levels of education.

The findings of the study can be utilized for planning curriculum including text book resource book, hand book, etc. Moreover, the findings can be used to develop learning models in different subjects to make the teaching learning process more effective and meaningful.

Conclusion

Comparison of Achievement Scores (pre-test and post-test) of Experimental (Computer Assisted Model) and control group (activity model) using ANOVA reveled that there is significant between post-test achievement scores Computer Assisted Model group and activity model group. And the difference is in favour of computer assisted model. Hence it can be concluded at is more effective than activity model group for teaching triangles in mathematics at standard IX.

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