

# Effectiveness of Computer Assisted Instruction in Certain Selected Content of Mathematics

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## ABSTRACT

The investigator has intended to study which is entitled “Effectiveness of Computer Assisted Instruction in certain selected content of Mathematics at Secondary Level”. The sample used for the study was the IX standard pupils of Government High school, Thanjavur district under Tamil Nadu state Board. The subject is to be converted into CAI packages in Algebra. The content frame work of the syllabus is from the prescribed Tamil Nadu state board text book for IX standard. Based on the findings the investigator has found that, there is a significant difference between the pre-test and post-test mean scores of the achievement in mathematics. The post-test mean scores of mathematics with respect to boys and girls, study habits, family status do not differ significantly in their achievement.

**Key words:** Effectiveness, Computer assisted instruction, Mathematics, self learning package.

## INTRODUCTION

“Computer assisted instruction” (CAI) refers to instruction or remediation presented on a computer. Many education Computers Programs are available online and from Computer stores and textbook Companies. They enhance teacher instruction in several ways. The use of Computers in education started in the 1960’s 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 straight forward presentation of data or they fill a tutorial role in which the student is tested on comprehension.

Computer-assisted instruction improves instruction for students with disabilities because students receive immediate feedback and do not continue to practice the wrong skills. Computers capture the students’ attention because the Programs are interactive and engage the students’ spirit of Competitiveness to increase their scores. Also, Computer assisted instruction moves at the students’ pace and usually does not move ahead until they have mastered the skill. Programs Provide differentiated lessons to challenge students who are of risk, average, or gifted.

### **Computer Assisted Instruction**

A self-CAI learning package technique, usually offline/ online, involving interaction of the student with programmed instructional materials. Computer-assisted

instruction (CAI) is an interactive instructional technique where by a computer is used to Present the instructional material and monitor the CAI learning package that takes place. CAI uses a Combination of text, graphics, sound and video in enhancing the CAI learning package process. The computer has many purposes in the classroom, and it can be utilized to help a student in all areas of the curriculum.

CAI refers to the use of the computer as a tool to facilitate and improve instruction. CAI Programs use tutorials, drill and Practice, simulation, and problem solving approaches to present topics, and they test the students understanding. A more modern method of individualized instruction is computer Assisted Instruction (CAI). A CAI needs programmed instructional material as software. It is self-directed CAI learning package tool. Primarily its efficiency depends on how will the PIM is prepared. The strategy behind the individualized instruction helps the learners to achieve mastery, mastery CAI learning package is refer to as 90/90 I.e., 90 percent of the learners will achieve 90 percent mastery over the subject provided through any form of individualized instruction.

#### ***Need and significance of the study***

In the formal education system, teaching plays a vital role, in spite of established sound theories of teaching. It still continues to be a challenging task. The individual differences among learners make most of the methods of teaching insufficient. The instructional materials like Programmed CAI learning Package materials, Models, and Computer Assisted Instruction (CAI) take care of individual differences. The CAI package is valuable to the learners and also helpful to the teachers as well. Of all, individual system, the CAI is a new method of instruction that has attracted more

attention together with the concept of models.

This approach of teaching has become as answer to the complicated modern, social, economic conditions and an exploding population. CAI package can be acted as teacher in the classroom situation. Using CAI, the time and expense involved in the teaching Process can be minimized. CAI appears helpful in facilitating individualization of instruction. The conventional methods of teaching are effective considering other factors but it owns limitations. The benefit of CAI for learners, including flexible schedule in instruction at locations, convenient to school and home, reduced student time, assessed progress in skill development, increases achievement and retention, continuous report to the learners about their Progress, accomplishment of specified performance, good response and feedback.

Hence there is a need for research and development of CAI software.

#### ***Statement of the problem***

So the investigator has intended to study which is entitled “Effectiveness of Computer Assisted Instruction in certain selected content of Mathematics at High school Level”.

#### ***Objectives***

1. To find out the significant difference between the pre-test and post-test mean scores of the achievement in mathematics.
2. To find out the significant difference between the post-test mean score of the achievement in mathematics with respect to sex.
3. To find out the significant difference between the post-test mean score of the achievement in mathematics with respect to Study habits.
4. To find out the significant difference between the post-test mean scores of

the achievement in mathematics with respect to family status.

### ***Hypotheses***

1. There is no significant difference between the pre-test and post-test mean scores of the achievement in mathematics.
2. There is no significant difference between the post-test mean score of the achievement in mathematics with respect to sex.
3. There is no significant difference between the post-test mean score of the achievement in mathematics with respect to Study habits.
4. There is no significant difference between the post-test mean scores of the achievement in mathematics with respect to family status.

### ***Definition of key terms***

#### ***CAI Package***

Refers to the computer Assisted Instruction, Comprising greeting part, Objectives of the package, Instruction part, pre-test and post- test through individual's CAI leaning package.

#### ***Effectiveness:***

The degrees of which objectives are achieved by the students are extent to which target for CAI learning package of algebra in mathematics.

#### ***IX Standard Students***

Refers to the learners who are studying IX standard under Tamil Nadu state Board system refers to the subject matter covered in IX<sup>th</sup> standard Maths.

#### ***Variables of the study***

Variables are the conditions or characteristics that the researcher manipulates controls or observes different variables selected by the investigator given the following sub heading.

#### ***Independent and dependent Variable***

The independent variables are the Conditions or characteristic that the research manipulates or controls in his/her attempt to

ascertain their relationship to observed phenomena. For the Present study, the investigator took CAI as the independent variables for experimental group. The dependent variables are the conditions or characteristic that appears, or changes as the researcher introduce, remove, or change independent variables. For the present study the achievement.

## **MATERIALS AND METHODS**

### ***Samples for the study***

The sample used for the study was the IX standard pupils of Government High school, Thanjavur district under Tamil Nadu state Board. The investigator request head master and mathematics teacher of the school and 40 students were selected as the sample in school.

#### ***Development of CAI package:***

The subject is to be converted into CAI packages in Algebra. The content frame work of the syllabus is from the prescribed Tamil Nadu state board text book for IX standard. The investigator identified the repertory and pedagogy. Concept and be included only the repertory concepts. The concepts are structured on the CAI learning package materials by following the norms and broken down into teaching points and arranged in a meaningful gradational order. Each idea is presented appropriately. The presentation of a single idea is known as frame. Some of the teaching points to be learnt by the learner are arranged in gradational order.

It is expected that the learner will follow are arranged in gradational order. It is expected that the learner will follow then without much difficulty. According to the suggestions given by the content specialists and educational technologists, some frames are changed in a novel way. Subjected the prepared frames, they are administered to a sample of hundred ninth standard students of Tamil Nadu state board. Based on studies,

reactions some changes are made and subjected to the review by the content specialists and the educational technologists once again. Thus the content validity of the CAI package was established

## RESULT

Table 1: Showing the Mean, standard Deviation, standard error and 't' values of pre-test scores and post-test scores:

	N	Mean	S.D	$SE_D$	$M_1 - M_2$	t - value	Significance at 0.05 level
Pre test	40	43.43	10.8602	2.061	43.3	21.013	Significant
Post test	40	86.73	7.2041				

The above table shows that the computed 't' value 21.013 is greater than the critical value of 2.68 at 0.01 level. Hence, it is significant. Consequently, the null hypothesis is rejected and it can be said that, there is a significant difference between the pre and post test mean scores of the achievement in mathematics. It is concluded from the above table that, the post test have achieved more than the pre-test.

### Analyses and Interpretation of data

Hypothesis-1. There is no significant difference between the pre-test and post-test mean scores of the achievement in mathematics.

Hypothesis-2. There is no significant difference between the post-test mean score of the achievement in mathematics of the experimental group with respect to Boys and Girls.

Table 2: Showing the mean, standard deviation, standard error and 't' values of boys and girls.

	N	Mean	S.D	$SE_D$	$ M_1 - M_2 $	t-value	Significant Level
Boy's	19	86.74	6.9724	2.2741	0.03	0.0132	Not Significant
Girl's	21	86.71	7.4075				

The above table shows that the Computed 't' value 0.0132 is less than the Critical value of 2.02 and 2.71 at 0.05 and 0.01 levels respectively hence it is not significant. Consequently the null hypothesis is accepted and it can be said that, there is no significant difference between the post-test mean scores of the achievement in mathematics of the experimental group with respect to boys and girls.

of the achievement in mathematics of the experimental group with respect to study habits.

Table 3: Shows the mean, standard deviation, and 'F' values of post-test scores with respect to study habits.

	N	Mean	S.D
0-1	17	85.765	5.846
1-2	19	86.316	7.233
2 Above	4	92.75	9.175

Hypothesis-3. There is no significant difference between the post-test mean score

Table 4: ANOVA Table

Scores of variation	SS Sum of squares	df	Ms Mean Variations of Squares	F-ratio	Significant level
Between group	164.08	2	82.04	1.588	Not Significant
sample BS					
Within sample WS	1911.92	37	51.67		

The table 4 shows that the Computed 'F' value 1.588 is less than the critical value of 2.23 and 5.18 at 0.05 and 0.01 levels respectively hence it is not significant. Consequently the null hypothesis is accepted and it can be said that, there is no significant difference between the post-test means scores of the achievement in mathematics of

the experimental group with respect to study habits.

Hypothesis-4. There is no significant difference between the post-test mean score of achievement in mathematics of the experimental group with respect to family status.

Table 5: Showing the mean, standard deviation, standard error and 't' value of post-test scores.

	N	Mean	S.D	$SE_D$	$ M_1 - M_2 $	t-value	Significant level
Joint family	10	87.4	7.539	2.7115	0.9	0.3319	Not Significant
Nuclear family	30	86.5	7.075				

The above table shows that the Computed 't' value 0.33319 is less than the critical value of 2.02 and 2.71 at 0.05 and 0.01 levels respectively, hence it is not significant. Consequently the null hypothesis is accepted and it can be said that, there is no significant difference between the post-test mean scores of the achievement in mathematics of the experimental group with respect to family status.

### Findings

1. There is a significant difference between the pre-test and post-test mean scores of the achievement in mathematics. It is concluded from the above table that, the post-test have achieved more than the pre-test.
2. There is no significant difference between the post-test mean scores of the achievement in mathematics of the experimental group with respect to boys and girls.
3. There is no significant difference between the post-test means scores of the achievement in mathematics of the experimental group with respect to study habits.

4. There is no significant difference between the post-test mean scores of the achievement in mathematics of the experimental group with respect to family status.

### DISCUSSION

Based on the findings the present investigations concluded that, the post-test mean scores of mathematics with respect to boys and girls, study habits, family status do not differ significantly in their achievement.

From this study, the investigator has found that, there is a significant difference between the pre and post test mean scores of the achievement in mathematics. It is concluded that, the post test have achieved more than the pre-test. The investigator found that the computer assisted instruction has a better impact on students easy to learn the mathematics concept compared to conventional teaching for teachers. It is also helping to handle the class easily and teach the lesson with multiple instructional materials. Students save the time properly and understanding the contents quickly.

## CONCLUSION

The specific conclusions emerged out of the present investigation are as follows. The investigator has found that, there is a significant difference between the pre-test and post-test mean scores of the achievement in mathematics. The post-test mean scores of mathematics with respect to boys and girls, study habits, family status do not differ significantly in their achievement.

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