



## 'A COMPARATIVE STUDY OF EFFECTIVENESS OF COMPUTER ASSISTED INSTRUCTION AND TRADITIONAL METHOD OF TEACHING MATHEMATICS TO THE 8<sup>TH</sup> STANDARD'

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### **ABSTRACT**

Logical thinking is an important aspect of all-round personality. Studying Mathematics can strengthen this faculty. Mathematics enjoys great significance in the field of education. To make the teaching of Mathematics effective a number of teaching methods and technologies are being evolved. Computer Assisted Instruction is one of them. In this study an attempt has been made to compare effectiveness of CAI method and traditional method of teaching Mathematics to the 8th standard. The study also aims at the views of the 8th standard students regarding CAI. The analysis shows that, the traditional and CAI method are equally effective for teaching Mathematics to the 8th standard students. Conclusions derived from the responses to the questionnaire reveal that CAI method is effective in evoking positive reactions towards the use of CAI in teaching learning. This will beckon a step further towards quality secondary education.

### **INTRODUCTION**

Variety of teaching methods adds spice to learning. Teachers need a repertoire of teaching methods to make their teaching more interesting, and therefore more effective. Now-a-days computer has become an integral part of teaching-learning process. An effective method of teaching-learning, namely, Computer Assisted Instruction (CAI) has now begun to show its applicability due to availability of computers in Indian schools. Several computer software are available in the market that help the learners studying the subjects like Mathematics, Science and English. Several researches done in India and abroad to test the efficiency of CAI have mostly revealed positive results in terms of achievement, attitude towards the subject, interest, retention of subject matter etc.. Most urban and even some rural schools have computer labs today. But surveys carried out revealed that computers are rarely used for teaching-learning even in urban schools. The day is not far off, when every class room can support its own computer and a large screen display.

While teaching Mathematics, it is necessary to explain the background of certain unit and carry out revisions time to time. In this way a teacher of Mathematics face many difficulties. Maharashtra State Bureau of Text-book Production and Curriculum Research has developed computer software of Mathematics for 8th standard. The students and the teachers are using this software since it is available

in the market. So it is necessary to check its applicability for teachers and students. Keeping this in view, a comparative study of effectiveness of Computer Assisted Instruction and Traditional method of teaching Mathematics for the 8th standard has been carried out. It was also intended to provide students with a first-hand learning opportunity and give them valuable insights regarding learning through CAI. CAI packages can be used in different ways, such as in self-learning mode or as an audio-visual aid by the teacher. In the present research it has been used as a audio visual aid for teaching.

### **OBJECTIVES OF THE STUDY**

1. To compare the effectiveness of Computer Assisted Instruction (CAI) and Traditional method of teaching Mathematics.
2. To know the views of 8<sup>th</sup> standard students regarding Computer Assisted Instruction (CAI).
3. To suggest remedies for the difficulties of the students regarding Computer Assisted Instruction (CAI).
4. To study the views of Mathematics teachers about computer software.

### **HYPOTHESIS**

There is no significant difference between mean scores achieved by the 8th standard students when taught Mathematics by CAI and Traditional method.

### **SAMPLE**

Out of 12 secondary schools in Karad city of Maharashtra State, the researcher finds two schools with well-equipped computer laboratories. Out of these two schools, Chattrapati Shivaji Vidyalaya has two divisions of 8th standard. By using lottery method one division was selected for the study. Since Sadguru Gadage Maharaj Vidyalaya has only one division, it has been considered. 49 students of Chattrapati Shivaji Vidyalaya and 39 students of Sadguru Gadage Maharaj Vidyalaya were selected as a sample. Thus, total 88 students of 8th standard framed the sample. To study the views regarding computer software, 52 teachers of Mathematics from all the 12 higher secondary schools in Karad city were selected as a sample.

### **TOOLS**

1. **Pre-test:** In order to assess students' pre-knowledge of concerned units pre-test was used. It was also intended to divide the students into two groups based on their marks. This test was of paper-pencil type and of 40 marks. Objective type questions were asked.
2. **Post-test:** After every experiment post-test was organized. In this way six post-tests of 20 marks each were organized. Unit wise post-test was intended to bring in relevance in the evaluation. The tests were of paper-pencil type and only objective type questions were asked.
3. **Questionnaire:** The questionnaire was used in this research to understand students' opinion and their difficulties regarding CAI. The questionnaire comprised of 10 questions, out of which 9 questions were in closed form and tenth question was of open type.
4. **Opinionnaire:** Likert technique was used in order to understand the opinion of the teachers of Mathematics regarding computer software used in this research. It comprised of 14 statements, out of which 7 statements were in favor of the software while others were against of it. 5-point scale was used for the responses.

### **EXPERIMENTAL DESIGN**

For the present research work a rotation group design was chosen. In it, experimental and controlled groups are equated as nearly as possible and these two groups undergo rotational treatment. Since both groups undergo rotational treatment, the predicted conclusions are more reliable.

### **PROCEDURE**

A pre-test was administered over the students selected as a sample in order to form two equal competent groups. This test was based on students' pre-knowledge. The students securing more or less the same marks in this test were paired. Based on this pairs group 'A' and group 'B' were formed. First six units of standard 8th Mathematics text-book were selected for the experiment. As per rotation group design group 'A' was assign as controlled and group 'B' as experimental for the first unit. This first unit was taught to group 'A' by using traditional method. In case of traditional teaching the researcher himself played the role of a teacher. At the same time group 'B' was taught the same unit by CAI method. Computer knowledgeable teacher of Mathematics guided the students whenever necessary. While teaching the second unit experimental and controlled groups were rotated. That means group 'A' was made experimental and group 'B' was made controlled. Group 'A' was taught the second unit by using CAI method while group 'B' was taught by traditional method. The same procedure has been maintained till the sixth unit. In this way these two groups were experimented thrice. After every experiment post-test was organized for both the groups. Thus six post-tests were administered for the six experiments. Results of these tests were evaluated independently and analyzed with the help of appropriate statistical measures. In case of questionnaire, it was given to all the 88 students selected for the sample as both the groups undergo experimental treatment. The researcher guided them as per necessary. An opinionnaire was given to 52 teachers of Mathematics belonging to 12 higher secondary schools in Karad city. For their responses, 5-point scale was used. All the teachers were responded well and returned it in time.

### **ANALYSIS AND INTERPRETATION OF DATA**

The data obtained from the post-tests was analyzed by using t-test. It involved the computation of the ratio between experimental variance and error variance. A rejection or acceptance of null hypothesis was decided on 0.05 and 0.01 level of significance. Regarding students' questionnaire, the percentage was measured by considering total number of students and their responses. Analysis has been done on the basis of this percentage. In case of last open type question the responses were collected and common difficulties were identified. In case of teachers' opinionnaire, the number of responses given to the statements and their weightings were multiplied and cumulative addition as well as cumulative percentage was measured. Based on this cumulative percentage the analysis has been done.

**Table No. 1**

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**Testing of Null Hypothesis**

Sr.No.	Unit No.	Standard t-value ( df=43 ) Level of Significance		Observed t-value
		0.05	0.01	
1	Unit No. 1	2.02	2.71	0.08
2	Unit No. 2	2.02	2.71	0.14
3	Unit No. 3	2.02	2.71	1.08
4	Unit No. 4	2.02	2.71	0.38
5	Unit No. 5	2.02	2.71	0.28
6	Unit No. 6	2.02	2.71	0.83

**RESULTS**

**Testing of null hypothesis**

1. After analyzing the post-test scores, it was observed that, in case of 5 units out of 6, the mean of the controlled group was grater than the experimental.
2. In case of a single unit out of six, the mean of the experimental group was grater than the experimental.
3. The difference in mean between the controlled and the experimental group was not statistically significant for all the six units.
- 4. Taken collectively all these results, the traditional and the CAI methods were equally effective for teaching Mathematics to the 8th standard.**

**STUDENTS' QUESTIONNAIRE**

1. Since computer education has been introduced in the school curriculum, all the students were exposed to the computers.
2. Most of the students could operate the computers.
3. Most of the students do not have computers at their home. Those a few that have a computer do not use it for their learning purposes.
4. More than 50% of the students opined that the schools do not have sufficient number of computers.
5. More than 50% of the students opined that they are not given sufficient time to handle computer during their school hours.
6. Most of the students felt that the subjects like Science and Mathematics are not taught by using computers.
7. Most of the students felt learning with the help of computer quite easier. In this sense they favored the CAI.
8. Most of the students also felt the need to learn other subjects by using computer.

9. The difficulties of the students while learning through CAI range from the installation of software, numerical difficulties, use of note-books, insufficient explanation of examples, the inadequacy of a system to inquire the uncomprehended statements etc..

#### **TEACHERS' OPINIONNAIRE**

1. All the units of 8th standard Mathematics are included in the software.
2. The content of the Mathematics is accurate and presentation is effective in the software.
3. There is a facility of providing adequate feedback in the programme.
4. The programme is helpful to develop knowledge and application of Mathematics among the students.
5. The programme in the software is reliable and user-friendly.

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