

A Comparative Study of Two Instructional Methods: Computer Assisted Instruction and Conventional Method for teaching Mathematics in class IX

A research paper submitted by,

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ABSTRACT

The biggest drawback of our education system is the traditional method of teaching. To overcome this, some changes in teaching methodology should be brought and by understanding the learning method, steps should be taken to make it speedier. Here is one tip for the same – Different activity of self learning should be implemented in order to get the students taking interest in study.

This study investigated the effectiveness of computer assisted instruction and conventional method on the achievement of secondary school students in mathematics using experimental method. A pre test post test control group design was used 64 students of class IX were selected. These students were equally divided in to two groups by I.Q. test prepared by K.G.Desai. The experimental group was taught through computer assisted instruction and the control group was taught through conventional teaching. To find out the significant difference, t-test was used. The results shows that the effectiveness of the students of the experimental group was significantly higher than the control group. Hence, the effectiveness of teaching of mathematics through computer assisted instruction was found to be more effective than conventional method.

Keywords: Computer Assisted Instruction, Conventional method, Achievement and Secondary School Stage

INTRODUCTION

“A nation’s progress greatness depends not only on its material achievements but also upon its great thinkers, artists and scholar that are regarded as creative genius and in fact, historical records provide evidence that cultures have collapsed because of failure to utilize, intelligent and imagination methods for solving their problem”

-Torrance (1962)

The biggest drawback of our education system is the traditional method of teaching. To overcome this, some changes in teaching methodology should be brought and by understanding the learning method, steps should be taken to make it speedier. Here is one tip for the same – Different activity of self learning should be implemented in order to get the students taking interest in study.

Now-a-days computers are used as all walks of life. They are used for management applications in factories and companies, in school to teach students, in banks to maintain client account, in airport and railway for reservation, in electricity and telephone department for preparing electricity and telephone bills. Like this their list is endless. Computers can be used by just about anyone: doctors, policemen, pilots, scientists, engineers, teachers and recently even house wives. Computers are used not only in numeric applications but also in non-numeric applications.

The national policy on Education 1986 has emphasized the application of educational technology to improve the quality of education at all levels.

STATEMENT OF THE PROBLEM

“A comparative study of two instructional Methods: Computer Assisted Instruction and Conventional Method for teaching Mathematics in class IX.”

RATIONALE OF THE STUDY

The main aim of education system is to provide education according to the demand of the society and time. To achieve this goal, it is necessary to make the present system of education more effectively, which is made possible to accept Information Communication Technology. (ICT). According to Dr. Abdul Kalam, the whole purpose of education in a country is to develop and enhance the potential of human resource and progressively transform it in to a knowledge society. Every nation wants to produce students who ultimately become the knowledge workers in their own economy to be global citizens.

In IT(Information Technology), CAI-Computer Assisted Instruction is one device, which has great importance in the field of Education. With its advantages of giving drilling, tutorial and gaming simulation, it makes learning and teaching more encouraging and interesting for the students. Computer Assisted Instruction is also more advantageous to both students and teachers, it allows teacher to give more attention to individual students also.

OBJECTIVES OF THE STUDY

1. To develop computer program on “Quadrilateral” unit in the subject of Mathematics for class IX students studying in GSEB syllabus.
2. To study the relative effectiveness of teaching mathematics in terms of two instructional methods for teaching Mathematics. i.e. computer assisted instruction and conventional method for the students of traditional group and Experimental group.
3. To study the relative effectiveness of computer program with reference to gender of the students in Experimental group.
4. To study the opinions of the students of Experimental group regarding effectiveness of used computer program in mathematics.

HYPOTHESIS OF THE STUDY

Following hypotheses are constructed and tested for the present research.

1. There will be no significant difference between the mean scores of pre-test and post-test of the student of Experimental group.
2. There will be no significant difference between the mean pre-test scores of the students of Traditional group and Experimental group.
3. There will be no significant between the post-test scores of the students of Traditional group and Experimental
4. There will be no significant difference between the mean pre-test scores of boys and girls of Experimental group.
5. There will be no significant difference between the mean post-test scores of boys and girls of Experimental group.

6. There will be no favorable opinions of the majority of students of Experimental group about the used Computer program in Mathematics.

METHOD AND DESIGN:

Experimental method was followed to achieve the objectives of the present study. In order to compare the effectiveness of two methods.

The main purpose of the research was to check the relative effectiveness of teaching mathematics in terms of computer Assisted instruction and conventional method. For Experimentation, two groups were formed. One group was designated as the experimental group and the other group was designated as control group. The groups were matched on the basis of scores achieved by the students of on the K.G.Desai's intelligence test. Experimental group was exposed to computer Assisted instruction and the control group was exposed to conventional method of teaching and did not receive any special treatment. Researcher develop the computer program on two chapters of Mathematics of class IX.

SAMPLE:

For experimentation a sample of 64 students of class IX was selected from R.N. Naik high school, udhana, surat city, Dr. K.G. Desai test was administered and their score on intelligence test were computed out. Two groups were equated on the basic of this I. Q. Test.

TOOLS USED:

The following tools were used in the present study:

- Instructional tools
- Measuring tools

INSTRUCTIONAL TOOLS:

1. Mathematics textbook of class IX
2. computer system
3. computer program

MEASURING TOOLS:

1. Dr. K.G. Desai Intelligence test.
2. Criterion Test
3. Opinionnaire

STATISTICAL TECNIQUES USED:

On the basis of objectives and design of the study the following statistical tecniques were used.

- 1: The measure of central tendency and the measure of dispersion such as mean and S.D. were found to know the nature of the data.
- 2: T-Test was used to compare the effect of computer assisted instruction and conventional teaching on the achievement of students.
- 3: For the analysis and interpretation of data obtained from opinionnaire, chi-square test was employed.

ANALYSIS AND INTERPRETATION :

The data of present study is given below in table. 1,2,3,4 and 5 and results are interpreted.

Table 1

Comparison of the Statistics for Pre-test & Post-test scores of Experimental Group

Statistics	Pre-test	Post-test	't'-value	Level of signif
Number of Student	32	32	12.1696	significant
Mean	12.0625	28.4062		
Standard Deviation	4.0236	8.9293		
Correlation(r)	0.5316			
Standard Error Of Mean	1.3431			

It can be seen from the table 1 that,

The obtained 't' – value of the Experimental group-II (R.N.Naik Highschool) was 12.1696 which was more than 0.05 level value 1.96 and 0.01 level value 2.58 with $df = 62$. Thus the null hypothesis that there is no significant difference between the pre-test and the post-test was not accepted. In other words, there was a statistically significant difference between the mean scores of the pre-test and the post-test.

The significant difference between the pre-test and the post-test score was because of the Computer Assisted Instruction.

Table 2

Comparison of the mean Pre-test scores of Traditional group & Experimental Group

Statistics	Traditional Group	Experimental Group	't'-value	Level of significance
Number of students	32	32	0.2597	Not significant
Mean	12.3437	12.0625		
Standard Deviation	4.6184	4.0236		
Standard error of Mean	1.0827			

It is clear from table 2 that,

The obtained 't'-value is 0.2597 which is not significant at 0.05 level and 0.01 level. Thus the null hypothesis that there is no significant difference between the pre-tests of both groups was accepted. In other words, statistically there is no significant difference between mean scores of the pre-tests of Traditional Group-II & Experimental Group-II.

Hence it can be concluded that Traditional Group and Experimental group were equal before treatment.

Table 3

Comparison of Statistics for post-test of Traditional Group & Experimental Group :

Statistics	Traditional Group	Experimental Group	't'-value	Level of significance
Number of students	32	32	5.2473	significant
Mean	16.7812	28.4062		
Standard Deviation	8.7941	8.9293		
Standard error of Mean	2.2154			

It is clear from table 3 that,

The obtained 't'-value is 0.2597 which is significant at 0.05 level and 0.01 level. Thus the null hypothesis that there is no significant difference between the post-tests of both groups was rejected. In other words, statistically there is significant difference between mean scores of the post-tests of Traditional Group & Experimental Group.

The significant difference between the post-test score of Traditional Group and Experimental Group was because Computer Assisted Instruction method.

Table 4

Comparison of the pre-test scores of Girls & Boys of Experimental Group :

Statistics	Girls	Boys	't'-value	Level of significance
Number of students	16	16	0.3413	Not significant
Mean	12.75	11.375		
Standard Deviation	4.2661	3.7749		
Standard error of Mean	4.0280			

It is clear from table 4 that,

The obtained 't'-value was 0.3413 which was less than 0.05 level value 2.042 and 0.01 level value 2.750 with $df=30$. Thus the null hypothesis that there is no significant difference between the mean pre-test scores of girls and boys of Experimental group-II was accepted. In other words statistically there is no significant difference between the mean pre-test scores of girls and boys of Experimental group-II.

It means that girls and boys were equal before treatment.

Table 5

Comparison of the post-test scores of Girls & Boys of Experimental Group :

Statistics	Girls	Boys	't'-value	Level of significance
Number of students	16	16	0.9008	Not significant
Mean	32.125	24.6875		
Standard Deviation	7.7190	8.7003		
Standard error of Mean	8.2243			

It is clear from table 5 that,

The obtained 't'-value was 0.9008 which was less than 0.05 level value 2.042 and 0.01 level value 2.750 with $df=30$. Thus the null hypothesis that there is no significant difference between the mean post-test scores of girls and boys of Experimental group-II was accepted. In other words statistically there is no significant difference between the mean post-test scores of girls and boys of Experimental group-II.

It means CAI for Mathematics, as a method was found equally effective for post-test of girls and boys of Experimental group.

FINDINGS :

1. There was a significant difference between the pre-test and post-test scores of Experimental group.
2. There was no significant difference between the pre-test scores of Traditional group and Experimental group.
3. There was a significant difference between the post-test scores of Traditional group and Experimental group.
4. There was no significant difference between the pre-test scores of girls and boys of Experimental group.
5. There was no significant difference between the post-test scores of girls and boys of Experimental group.
6. Majority of students of Experimental group showed favorable opinion about the used computer program in Mathematics.

EDUCATIONAL IMPLICATIONS :

1. Teachers should use computer program to create, more motivating and exciting lessons for their students.
2. Computer program can illustrate some mathematical principle by process on the computer screen.
3. Computer assisted instruction increases reflective thinking among students.
4. Computer program engage students in learning concepts effectively.

CONCLUSION :

The results of this study reveal that that computer assisted instruction has a more positive impact on the achievement of class ninth students in mathematics as compared to conventional teaching. The reason may be that with computer program, the communication of the information can be done in a more effective manner because it delivers the information by using various media, i.e. via sound, text, animation, video and images. In short, it can be said that if computer is used in classrooms, it could prove to be effective.

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Journals

NO.	Journal name	Vol. no.	Issue no.	Year-month	publication	Page no.
1	Indian Educational Abstracts	3	2	July-03	NCERT Delhi	78
2	Indian Educational Abstracts	8	1	January-08	NCERT Delhi	49
3	Educational Review	48	1	January-11	NCERT Delhi	96
4	New FRONIIERS IN EDU.	44	4	Oct-Dece-11	New FRONIIERS IN EDU. TRUST New Delhi	437

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