

Development and Try Out of Computer Program of “Circle” in Mathematics in Class IX

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I. INTRODUCTION

”Mankind is now in the midst of the Fourth Revolution in Education- The Age of Electronic Media, which consists of radio, television, computer and so on”

-Eric

The word “Computer” is derived from the word “to compute”, which means ‘to calculate’. Therefore, many people think that a computer is just another calculating machine- a fast calculator. But it is much more than that. It is not just a fast calculating device. It can perform a variety of different operations apart from arithmetic calculations. A computer is now regarded as a multi-purpose tool that is constantly evolving. It can be used also used for knowledge sharing. It can be used to handle audio and video information. It can also be used for communicating messages. Thus, it can be used for a variety of different purposes. Early computers were used to perform arithmetic calculations at fast speed, but now they are used in almost all to represent facts, things, concepts of our life. A computer can be defined as a machine that receives some kind of data, process it, and produces some kind of output. Computers perform data processing under the direction of instructions given by us. These instructions can be stored in a computer. A computer is a machine that can solve problems for us by executing instruction given to it. In this era of technology revolution and with a great boom in the field of information technology, knowledge of computers becomes very essential for every one. Information technologies have played a vital role in higher education for decades.

Computer is an interesting innovation in Educational Technology. Its marvels have been demonstrated and seem to revolutionize the whole spectrum of education. It has better flexibility and more versatility than any of the teaching machine. It can cater to the individual needs of many students at a time and record all the responses of all the pupils with reliability. A learner can make progress at one’s pace, receive and choose the material, sequencing and level of instruction freely. The teacher can be relieved from the daily routine and monotonous drilling activities. It has been experimentally proved that any lesson in any subject can be programmed and learning materials can be represented in words, visuals and experiments. The course is broken up into small elements of information which the computer presents one by one. But it has yet to be fully integrated into the learning process.

A good amount of information stored in the computer is made available to the learner more readily than by any other media. But judicious pre-planning and careful programming are

essential for this. In the multimedia-based interactive learning, the media is the instructor and the emphasis is on self-learning. The study attempts to ascertain how best a teacher can use the computer to improve learning in the classroom.

II. OBJECTIVES OF THE STUDY

The present research was carried out with the following main objectives:

1. To develop computer program on unit “CIRCLE” in the subject of Mathematics for std IX students, studying GSEB syllabus.
2. To study how far the computer helps the students to understand the basic concepts of Mathematics.
3. To study the relative effectiveness of teaching mathematics in terms of two methods of teaching Mathematics i.e. conventional method of instruction and Computer program for the students of Traditional group & Experimental group.
4. To study the opinions of the students of Experimental group regarding effectiveness of used Computer program Mathematics.

III. HYPOTHESES OF THE STUDY

The present research was of experimental type and so the researcher had formed the following null hypotheses:

1. There will be no significant difference between the mean scores of pre-test & post test of the students of Experimental group.
2. There will be no significant difference between the mean pre test scores of the students of Traditional group & Experimental group.
3. There will be no significant difference between the mean post-test scores of the students of Tradition group & Experimental group.
4. There will be no favorable opinions of the majority of students of Experimental group about the used of Computer program in Mathematics.

IV. IMPORTANCE OF THE STUDY

The importance of the research is as follows:

1. Keeping in mind the more numbers of students in the classroom, it is but natural that the lecture cum narration method may not fulfill the individual needs and speeds of the students.

2. The students will develop the confidence to learn individually.
3. It is our common experiences that self-learning is more effective and more productive compared to any other teacher-centered method.
4. It is very useful for slow learners as they can learn at their own speed.
5. Even in the absence of teacher the students can learn through such computer programs.
6. The programs which have been recorded can be stored, retrieved and used repeatedly.
7. The researcher believes that the present study will be very useful for both the students and the teachers.

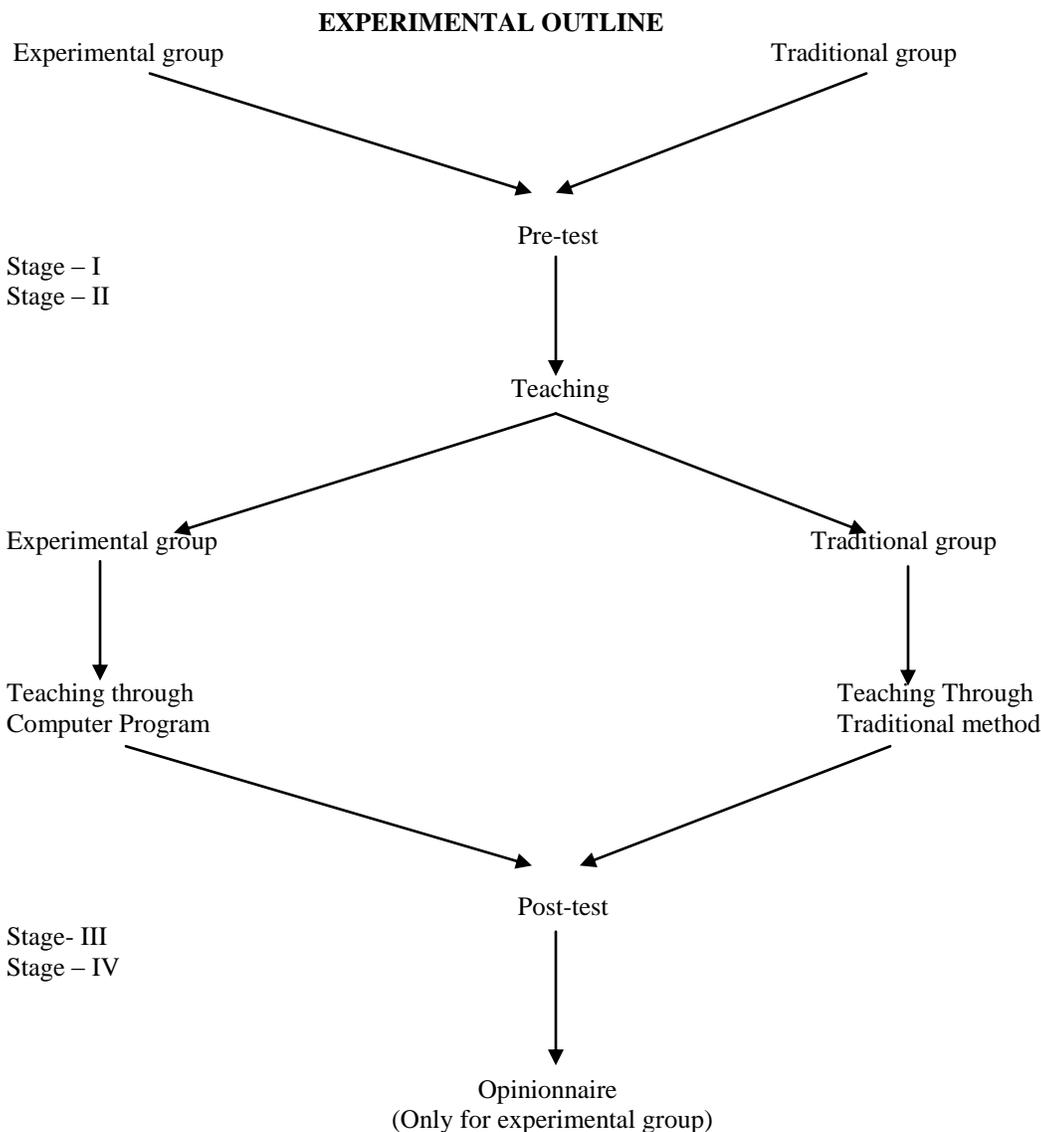
V. POPULATION AND SAMPLE

The present research was meant for the students of Gujarati medium schools of standard IX studying the syllabus of Gujarat State Board of School Textbooks, Gandhinagar. Therefore, for the present research, the population was all the students of standard IX of Gujarati medium schools of Gujarat state.

The main purpose of the research was to check the effectiveness of Computer program in Mathematics and to study how far this material helps the students to learn themselves. The researcher used purposive sampling technique for selecting the city and the school. For it the researcher selected the school: M.B.M Convent High School, Bardoli. Two groups, each of 32 students were formed. Thus, Total 64 students were selected from the school. Two groups were equated on the basis of I.Q. test.

VI. RESEARCH DESIGN

The present study was developmental cum experimental in nature and consisted of two parts. The first part consisted of development of the Computer program on one chapter: CIRCLE of Mathematics of standard IX. The second part of the study was concerned with measuring the effectiveness of the developed computer program. In order to study the effectiveness of the developed computer program the pre-test post-test control group design was employed.



ANALYSIS OF DATA

VII. DATA COLLECTION

The main field experiment was conducted in M.B.M Convent HighSchool of Bardoli, D- Surat. Two equivalent groups of students of standard IX were formed based on their scores of Intelligence test. The pre-test post-test control group design was used in the present study to find the effectiveness of the computer program. Total sixty-four students participated in experiment. Thirty two students in traditional group and thirty two students in experimental group. Before the Experiment was started the students were pre-tested on a criterion test to find out their knowledge about the content. The students of traditional group were taught through traditional teaching method and the students of experimental group were taught through the computer program. All the participants were post-tested on the same criterion test. For the qualitative evaluation of computer program, an opinionnaire was given to the students of experimental group.

VIII. STATISTICAL TECHNIQUES USED FOR DATA PROCESSING

There are various statistical techniques to analyze the data collected during research. The present study is experimental research. Hence for the analysis and interpretation of data the statistical technique ‘t’-test was employed. For the analysis and interpretation of data obtained from opinionnaire, chi-square test was employed.

Table 1: Comparison of the Statistics for Pre-test & Post-test of Experimental Group

Statistics	Pre-test	Post-test	‘t’-value	Level of significant
Number of Students	32	32	23.683	significant
Mean	10.4375	27.75		
Standard Deviation	3.22	5.85		
Correlation(r)	0.7294			
Standard Error Of Mean	0.731			

The obtained ‘t’ – value of the Experimental group (M.B.M.Convent Highschool) was 23.683 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 retained. 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. From this it can be said that the learning through CAI was remarkably useful.

**Table 2
 Comparison of Statistics for pre-test of Traditional Group & Experimental Group :**

Statistics	Traditional Group	Experimental Group	‘t’-value	Level of significance
Number of students	32	32	2.8579	significant
Mean	12.625	10.4375		
Standard Deviation	2.8932	3.2222		
Standard error of Mean	0.7654			

The obtained ‘t’-value was 2.8579 which is greater than 0.05 level value 1.96 and at 0.01 level value 2.58 with $df=62$.

The obtained ‘t’-value is 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 rejected. In other words, statistically there is significant difference between mean scores of the pre-tests of Traditional Group-I & Experimental Group

Hence it can be proved that Traditional Group is statistically good than Experimental Group 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	5.6859	significant
Mean	19.531	27.75		
Standard Deviation	5.711	5.8530		
Standard error of Mean	1.4455			

The obtained 't'-value is 5.6859 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 of Computer Assisted Instruction.

From the results, it is concluded that the used CAI was found effective in teaching the units-'Quadrilaterals', 'Areas of parallelograms and triangles' and 'Circle'- to the students of Experimental group of class IX of M.B.M.Convent highschool, Bardoli. In short, used CAI method was found effective than Traditional method.

IX. MAJOR FINDINGS OF THE STUDY

The major findings of the study are as follows:

1. The study has resulted in the development of a computer program on "CIRCLE" for teaching Mathematics to the students of standard IX of Gujarati medium schools.
2. The developed Computer program on "CIRCLE" was found significantly effective for the students of std. IX of Experimental group.
3. There was no significant difference found between the mean pre-test scores of Experimental group and Traditional group.
4. There was a statistically significant difference between the mean gain scores of Experimental group and Traditional group. The significant difference found was because of computer program.
5. The computer program was qualitatively evaluated by the students of Experimental group with the help of an opinionnaire. Students revealed highly favorable opinion towards computer program. The majority of the students found the program knowledgeable, innovative and interesting. They were also ready to use such programs in future for other subjects also.

X. SUGGESTIONS FOR FUTURE RESEARCH

1. The program can be made on other chapters of standard IX.
2. The program can be made on other subjects also.

3. It can be made for the students of English Medium also.

XI. CONCLUSION

Present research was a modest attempt to check the effectiveness of computer program as an aid in teaching of Mathematics. It will provide inspiration and necessary guidance for carrying out further research in this field. By applying such innovative approaches students involvement in teaching & interest in learning can be increased and maintained. In conclusion, it can be said that computer could prove to be effective learning approach if it is used in classrooms.

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