Impact Of Computer Assisted Instruction (CAI) In Teaching Geometry For Middle School Students

Abstract

Educational technologies play a vital role in teaching and learning process. CAI is one of the methods of auto instructional teaching to make the classroom teaching lively by creating interest among the students. Review of many research studies indicate that learning the concepts in geometry is enhanced through CAI. CAI was considered as independent variable and academic achievement with sub variables gender, locale and type of school was taken as dependent variable. This study investigates whether there is any improvement in the academic achievement of students in geometry through computer assisted instruction. Achievement tool consisting fifty objective type questions was constructed as per the blueprint and validated by the guidance of experts.

1 Introduction

The main focus of education is the transaction between teacher and learner in various kinds of formal and informal setting. Based on the recommendation of education commission (1964-66) Mathematics is a compulsory subject for all school students. Many students feel Mathematics, especially geometry concepts is difficult largely as a result of the way of teaching and score fail marks in the examination. The major reason for failure is that the teacher cannot pay attention to the basic concepts and generally adopt methods of solving questions with crammed up formulae. Effective methodology should be adopted by the teacher to enrich the knowledge and develop necessary skills among the students to cope up in the competitive world.
This study investigates whether there is any improvement in the academic achievement of students in geometry through computer assisted instruction as well as find out the impact of computer assisted instruction in geometry.

2 Objectives

I. To find out the achievement of students at standard VII level in geometry.
II. To find out the impact of computer assisted instruction in geometry.
III. To find out whether there is any significant difference between the posttest scores of control group and experimental group students in geometry.
IV. To find out the whether there is any significant difference between the posttest scores of control group and experimental group students in geometry with respect to gender, locale and type of school.

3 Hypotheses

I. The achievement level of students at standard VII in geometry is poor
II. CAI has no impact in the teaching of geometry.
III. There is no significant difference between the posttest scores of control group and experimental group students in geometry.
IV. There is no significant difference between the posttest scores of control group and experimental group students in geometry with respect to gender, locale and type of school.

4 Variables of the study

CAI was considered as independent variable and academic achievement with sub variables gender, locale and type of school was taken as dependent variable.

5 Research Methodology

5.1 Method of study
In order to find out the impact of CAI researcher reviewed many studies and selected quasi experimental design with pre-test and post-test for control group and experimental group.

5.2 Population and sample
The population of the study comprises Government and Aided middle schools in two blocks, Pattukkottai and Madukkur of Thanjavur district. A sample constitutes of 60 students from VII standard for control group and 60 students for experimental group was selected using random sampling technique. The researcher compared two control groups with two experimental groups for the purpose of replication within the same framework.

5.3 Instrument
Achievement tool consisting fifty objective type questions was constructed as per the blueprint and validated by the guidance of experts.

5.4 Preparation of CAI package
A workshop was conducted for the preparation of academic script of CAI package in geometry with the guidance of subjects experts and also with the consultation of software professionals and
media experts, while developing the package, the researcher adopted different stages such as defining the purpose and ideas of the lesson, organizing the ideas and producing lesson displays, programming and evaluating the impact of the lessons.

5.5 Research Procedure

To assess the level of VII standard students pre-test was conducted for both control group and experimental group. The experimental group students were motivated to learn geometry through CAI. The treatment lasted four weeks. Control group was taught by traditional method. After the treatment post-test was administered to both the groups.

6 Data Analysis And Interpretation

Mean, SD and t ‘test were used as statistical techniques. The obtained scores were converted for hundred marks, analyzed in a comparative manner and presented in the following tables.

Table -1: Pretest achievement mean score of control group and experimental group in geometry

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control Group</td>
<td>60</td>
<td>22.77</td>
<td>6.67</td>
<td>0.086</td>
<td>NS</td>
</tr>
<tr>
<td>2</td>
<td>Experimental Group</td>
<td>60</td>
<td>22.90</td>
<td>6.679</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NS – Non significant

Table value of df at 118 is 2.660 at 0.01 level of significance.

Calculated ‘t’ value is lesser than the table value. The above table indicates that there is no significant difference between the achievements means score of control group and experimental group in the pre-test.

In order to find out the impact of CAI in learning geometry over the conventional method gain score analysis was used.

Table - 2: Gain score analysis in geometry

<table>
<thead>
<tr>
<th>S.No</th>
<th>Group</th>
<th>N</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Gain Score</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control Group</td>
<td>60</td>
<td>22.7</td>
<td>53</td>
<td>30.23</td>
<td>14.89</td>
</tr>
<tr>
<td>2</td>
<td>Experimental Group</td>
<td>60</td>
<td>22.90</td>
<td>68.02</td>
<td>45.12</td>
<td></td>
</tr>
</tbody>
</table>

Gain score difference 14.89

The above table indicates that the percentage of mean gain score for experimental group is greater than the control group. Hence, the impact of CAI among VII standard students in learning geometry is more than the students learning geometry through conventional method.
Table 3: Post-test mean score analysis

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control group</td>
<td>60</td>
<td>53.08</td>
<td>7.470</td>
<td>11.317</td>
<td>S</td>
</tr>
<tr>
<td>2</td>
<td>Experimental Group</td>
<td>60</td>
<td>68.20</td>
<td>7.163</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S – Significant.

Table value at df 118 is 2.660 at 0.01 level of significance.
The calculated value of ‘t’ is greater than the table value at 0.01 level of significance.
Mean score value of experimental group students is at higher level than the control group students in their achievement in geometry. So null hypothesis is rejected and it is evident that there is a significant difference between the achievement of VII standard students in learning geometry through CAI and through conventional method in the post test.

Table 4: Testing the difference in the post-test score of control group and experimental group with respect to variables

<table>
<thead>
<tr>
<th>S. No</th>
<th>Group</th>
<th>Variables</th>
<th>Category</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>‘t’ Value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control Experimental</td>
<td>Gender</td>
<td>Boys</td>
<td>32</td>
<td>49.41</td>
<td>6.353</td>
<td>13.679</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Boys</td>
<td>33</td>
<td>65.88</td>
<td>5.721</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Control Experimental</td>
<td>Gender</td>
<td>Girls</td>
<td>28</td>
<td>57.25</td>
<td>7.219</td>
<td>7.258</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Girls</td>
<td>27</td>
<td>70.70</td>
<td>6.520</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Control Experimental</td>
<td>Locale</td>
<td>Rural</td>
<td>36</td>
<td>53.75</td>
<td>7.517</td>
<td>9.177</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rural</td>
<td>36</td>
<td>9.25</td>
<td>6.793</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Control Experimental</td>
<td>Locale</td>
<td>Urban</td>
<td>24</td>
<td>49.17</td>
<td>5.096</td>
<td>12.183</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Urban</td>
<td>24</td>
<td>70.04</td>
<td>6.666</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Control Experimental</td>
<td>Type of School</td>
<td>Govt</td>
<td>30</td>
<td>49.60</td>
<td>10.452</td>
<td>7.677</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Govt</td>
<td>30</td>
<td>67.64</td>
<td>7.523</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Control Experimental</td>
<td>Type of School</td>
<td>Aided</td>
<td>30</td>
<td>49.23</td>
<td>5.103</td>
<td>14.576</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aided</td>
<td>30</td>
<td>67.13</td>
<td>4.380</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S – Significant at 0.01 level. Table value at df 58 is 2.660
The obtained ‘t’ values in the above table indicate that there is a significant difference between the achievement of students learning geometry through CAI and through traditional method in terms of gender, locale and type of school.

7 Findings

I. The achievement level of VII standard students in geometry is poor and no significant difference between the control group and experimental group in the pretest
II. The impact of CAI among VII standard students in learning geometry is more than the students learning geometry through conventional method.
III. There is a significant difference between the achievement of VII standard students in learning geometry through CAI and through conventional method in the post test.

IV. There is a significant difference between the achievement of students in learning geometry through CAI and through traditional method in terms of gender, locale and type of school.

8 Implications

I. To improve the achievement of students in geometry self-learning CAI package for identified areas in Mathematics may be developed and distributed to the teachers.

II. Teachers require knowledge for developing CAI package and strategy to instruct the students. Hence training should be arranged to the teachers in these areas.

III. The findings of the study show that CAI is an effective tool for the teachers to facilitate self-learning and enhance the achievement level of students as per their individual difference.

9 Conclusion

The present study indicates that CAI is an appropriate strategy to understand the concepts in geometry. CAI improved the achievement of students in geometry when compared to the conventional method. While framing curriculum the areas where ever CAI is applicable to be found out by the concerned authorities for enhancing the quality of Mathematics education. CAI packages in Mathematics to be collected and kept available in the school library to help the teachers for implementing this strategy in the class room. From the findings of the study it is inferred that the impact of CAI among the VII standard students is more than the impact of conventional method. The problem of low achievement in geometry can be solved by adopting CAI strategy to enrich the teaching learning process and make the class room teaching lively.

References