

EFFECTIVENESS OF COMPUTER ASSISTED INSTRUCTIONS (CAI) IN TEACHING OF MATHEMATICS AT SECONDARY LEVEL

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ABSTRACT

The present study was aimed at effectiveness of computer assisted instructions (CAI) in teaching of mathematics at secondary level adopted experimental method and observing the difference between (CAI) and traditional method. A sample of sixty (60) students of IX class in VVB Matriculation Higher Secondary School at Elayampalayam, Namakkal district were selected for a sample and sample was divided into two group namely experiment and control group. The experimental group consisted 30 students who were taught 'Mensuration' by the computer assisted instructions and the control groups comprising 30 students were taught by the conventional method of teaching. Data analyzed using mean, S.D. and t-test. Findings of the study clearly point out that significant increase in the mean gain scores has been found in the post test scores of the experimental group. Significant differences have been found between the control group and experimental group on post test gain scores. The experiment group, which was taught by the CAI showed better, learning. The conclusion is evident that the CAI is an effective media of instruction for teaching Mathematics at secondary students.

Keywords : CAI, Mathematics and Secondary level.

1 INTRODUCTION

The introduction of computers into the business world in the mid 1950s made important changes for future perspectives because the purpose of the first generation computers had been purely scientific. The early 1960s saw the integration of computers into both business and scientific life, but this was only in limited functions. Microprocessors were used to build microcomputers in the mid 1970s and the first personal computers (PCs) were introduced for individual use in business and in education. An abundance of educational and business software was also developed. In this era, the computer caught the imagination of educators to see how it could enhance learning and thinking.

Teacher play very prominent role in molding up tomorrow's citizen, the teachers should possess training in using the most modern technologies in the field of education. Computer assisted instructions (CAI) has emerged as an effective and efficient media of instruction. The CAI not only makes the communication impressive, but also helps in motivating the learners and arouses curiosity. In science teaching the CAI has been proved to be greatly beneficial to understand the unfamiliar situations and in making the conceptual clarity. Certain topics in Mathematics are based more on imagination; the computer assisted instructions.(CAI) can prove to be helpful to teach such topics. There is a need to recognize the importance of media of communications including audio visual and demonstration materials as necessary device to impart the scientific knowledge to pupils. Therefore, it is worthwhile to find the

effectiveness of CAI in teaching learning process of mathematics.

2 REVIEW OF RELATED STUDIES

Fin Sindhi, N.O. (1996) Studied the construction and try out of multimedia package for the teaching of physics in standard XI. The study revealed that there is a significant difference between mean of pre test and post test scores of the experimental group. This shows the effectiveness of multimedia package. There is a significant difference between mean post test scores of controlled group and experimental group. This proves that the teaching through multimedia package is more effective in comparison to conventional method of instruction. There is no significant difference between the mean post test score and mean scores of retention test of experimental group. This shows that if the teaching is done through multimedia package than student can remember it for a longer time.

Rivet, J.R. (2001) Studied students achievement in middle school Mathematics Computer Assisted Instruction versus traditional instruction method, four 6th grade classroom were identified, two classroom within each of two middle schools. Two classrooms used Computer Assisted Instruction as the primary means of content delivery involving mathematical concepts all pertaining to the content area of fractions. Within the same content area, the other two classrooms'

primary mode of instruction remained the lecture and text-book. A quasi experimental pre test post test design was used. Following a six week study, difference scores were examined to substantiate the primary hypothesis that the use of Computer Assisted Instruction led to increases student achievement when compares to traditional instruction techniques. Findings: In spite of variability in performance in individual types of fraction operations, the overall improvement scores were significantly greater in Computer Assisted classrooms than in the traditional classrooms. Further, in spite of the achievement difference between schools, the Computer Assisted classrooms performed better than the traditional classrooms at each school

3. OBJECTIVES OF THE STUDY

1. To prepare a computer assisted instructional package on the topic of 'Mensuration'
2. To compare the mean scores of the control group and experimental group in their pre test
3. To find out whether there is significant difference in the scores of the pre test and post test of the control group.
4. To find out whether there is significant difference between the score of the pre test and post of experimental group.
5. To compare the scores obtained by the control group and experimental group in their post test.

4. HYPOTHESES OF THE STUDY

1. There is no significant difference between the mean scores of experimental and control group in the pre test.
2. There exists no significant difference between the mean scores of the pre test and post test of the control group.
3. There exists a significant difference between the pre test and post test gain scores of experimental group.
4. There is a significant difference between the post test scores of the control group and experimental group.

5. METHODOLOGY

5.1 Design of the study

The investigator adopted experimental method for the present study. Sixty (60) students of IX class in VVB Matriculation Higher Secondary School at Elayampalayam, Namakkal district were selected for a sample and sample was divided into two group namely experiment and control group. The experimental group consisted 30 students who were taught 'Mensuration' by the computer assisted instructions and the control group comprising 30 students was taught by the conventional method of teaching. The sample of sixty students was divided into two equated groups of 30 students in each. Both the group was equated as nearly as possible in terms of their achievement scores in mathematics in their half yearly examination. Students having similar range of marks in

half yearly examination were divided equally and randomly in both the experimental and control groups. To find out whether there was any significant difference between the two groups; t-test was applied to scores of the half yearly marks. The value of t-was calculated as 1.41, which was insignificant. Hence an attempt was made to increase the internal validity of the results and it was assured that both the groups were equivalent to each before beginning of the experiment.

5.2 Construction of Tools

The investigator constructed an achievement test in Mathematics on the topic of 'Mensuration'. The achievement test containing 30 items was administrated to 10 students of IX class who were not included in the sample of the study. Experts of the views expressed by the experts after the logical evaluation of the test items were taken as the index of the validity of the tool. The reliability was established by the split half method and their reliability coefficient was found to be 0.81, were which depicted the reliability of the tool. The final form of the scale containing 25 items was used as an achievement test .The same test was used in pre test as well as in post test of the study.

5.3 Development of CAI

The contents were taken from the 9th standard state board on the mathematics. The computer assisted instructions were developed by dividing the whole content into different tasks, which were presented in the form of micro soft power point. After completing each question was post there to test the understanding and learning of the students. Appropriate background, coloring and pictures were order to made instructions more interesting. The experimental group was exposed to CAI and the control group was instructed by the traditional method of teaching. At the end of the teaching by CAI and by traditional method, a post test was administrated to all the students of both the groups. To find the significance of the difference between pre and post test scores t-test was applied.

6. THE STATISTICAL TECHNIQUE USED

Statistical techniques serve the fundamental purpose of the description and inferential analysis. The following statistical techniques were used in the study; mean, Median, Mode, standard Deviation and t-test were calculated.

6.1 Results and Discussion

The results obtained in the experiment were tabulated and have been presented in the form of table and discuss below:

Table-1
Experimental and Control Group in the Pre-Test

Group	N	Mean	S.D	t-value	Level of Significance
Experimental	30	12.20	2.71	1.31	Not significant
Control	30	13.01	2.50		

The above table reveals that the mean achievement score in the pre test are 12.20 and 13.01 for the experimental and control group. The 't' value is 1.31, which is not significant at 0.05 level. Hence it can be concluded that there is no significant difference between experimental and control group in the pre test of achievement. Both the group has nearly the same score in the pre test. Hence the first null hypothesis has been accepted.

Table-2
Control group in the Pre and Post test

Group	N	Mean	S.D	t-value	Level of Significance
Pre-test	30	12.21	2.70	1.54	Not significant
Post-test	30	13.20	2.61		

The above table shows that the mean scores obtained by control group in pre and post-test are 12.21 and 13.20 respectively. The t-value is calculated as 1.54, which is not significant at 0.05 level of confidence, this calculated value is lesser than the table value hence control group has showed no significant change in their achievement scores in pre and post test. Hence the second hypothesis is accepted.

Table-3
Experimental group in the Pre and Post-test

Group	N	Mean	S.D	t-value	Level of Significance
Pre-test	30	13.01	2.51	7.1	Significant
Post-test	30	17.70	2.40		

The above table shows that t-value is 7.1 which is statistically significant at 0.05 level of confidence. Hence it can be safely calculated that experimental group has achieved significantly higher score in the post test. This evidently the positive impact of CAI an achievement the students. With this result the third hypothesis of the study is accepted.

Table-4
Experimental and Control group in Post test

Group	N	Mean	S.D	t-value	Level of Significance
Experimental	30	17.70	2.60	7.41	Significant
Control	30	13.20	2.41		

The table shows the mean scores of the experimental and control group are 17.70 and 13.20 respectively in the post test. The t-value is 7.41 which are significant at 0.05 levels. Hence it is interpreted that the experimental and control group differ significantly in the post test and the difference is in favor of experimental group. Conclusion is evident that the students who are taught by the computer assisted instructions learned more and so higher achievement than the traditional method of teaching. This is due to the favorable impact of CAI an achievement of the students. Hence the fourth hypothesis

of the study is accepted.

7 CONCLUSION

The result of the present study clearly point out the significant increase in the mean scores has been found in the post test scores of the experimental group. Significance differences have been found between the control and experimental group on post test scores. The experimental group, which was taught by the CAI, showed better learning. The conclusion is evident that the CAI is an effective media of instruction for teaching of mathematics in secondary students.

8. EDUCATIONAL IMPLICATIONS

The present study has established that CAI significantly improves the performance and learning achievement of the students in mathematics. In present time the computer education has been introduced at the school level. The teacher should use computer is a media of instructions in class room. CAI can be arranged to be presented in large class rooms as it provides maximum amount of variety and flexibility by maintaining the quality and quantity. Mathematic teacher should be acquired knowledge of variety method of teaching. Teacher should provide with proper training.

REFERENCES

- [1] Anastasi.A. (1990). *Psychological Testing*. New York: Macmillan Pub lishing Co.
- [2] Aggarwal.Y.P.(1974). *Survey of Audio Visual Material at the Secondary Training College*. NCERT. New Delhi.
- [3] Berger. Arthur. A. (1982). *Media Analysis Techniques*. New Delhi, Sage Publications.
- [4] John W.Best and James V. Khan (2006). *Research in Education*, Tenth Edition, New Delhi, Prentice Hall of India Pvt.Ltd.
- [5] Garrett, Henry.E.(2005). *Statistics in Psychology and Education*. Twelfth Indian Reprint, Paragon International Publishers, New Delhi.

WEBLIOGRAPHY

- <http://www.becta.org.uk>
- <http://oecdpublications.gfi-nb.com>
- <http://www.eric.ed.gov>