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EFFECTIVENESS OF COMPUTER ASSISTED INSTRUCTIONS (CAI) ON ACHIEVEMENT OF SENIOR SECONDARY STUDENTS IN GEOGRAPHY

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ABSTRACT : *Learning through Computer Aided/Assisted Instructions (CAI) is a relatively new and rapidly evolving concept in the academic field that explores the role of Information and Communication Technologies in teaching and learning process. Considering the importance of computer in the field of education this pilot study was conducted to find out the effectiveness of computer-assisted teaching method over the teacher-centered method together with the academic achievement of geography students. In this study, the randomized posttest only control group design was used and 11th class concepts (Interior of the Earth, Minerals & Rocks, impact of Exogenic forces on earth crust) of geography were selected for the study. This pilot study has lasted for one month with the post- test of both the groups. After t-test analysis, data revealed that computer-assisted instruction is more effective than the teacher-centered/traditional method to increase the academic achievement in geography.*

Key Words: Computer Assisted Instructions, traditional method of teaching, Geography

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INTRODUCTION : Technology has become very important in human life at the present time. Technology proves to change the less developed characteristics of the countries by changing their culture and social structures. Therefore, the knowledge which provides appearing and the advance of the technology have been key for development and improvement.

In the 21st century, technology is influencing and supporting what is being learned in schools and colleges. It is also changing the way students are learning. Now it has time to moves from content-centered approach to competency-based approach of teaching with moving away from teacher centered forms of delivery of content to student-centered forms. Through technology facilitated approaches, contemporary learning settings now encourage students to take responsibility for their own learning.

The main and important part of the technology to enhance the level of imparting instruction to students and providing quality education is the use of Computers. An interactive instructional method that uses a computer to present material, track learning, and direct the user to additional material which meets the student's needs is called Computer-assisted instruction (CAI). CAI can also be used to explain Internet-based instruction with the use of webpages, web bulletin boards, video and real audio, graphics, and hands-on applications. Additionally, self-teaching/instructional programs on CD-ROM or the emerging DVD, round out the group of available forms of CAI. (Bucholtz, 1998)

JUSTIFICATION OF THE STUDY : Geography teaches us about our own country its natural advantages, resources, and beauty; it's greatness and possibilities, and also its limitations, which enables us individually or as a nation to make better adjustments to our physical environment. Geography is a science which redounds to the student to have positive behaviours related to technology. Therefore one of the main aims of the geography teaching education is to bring up people who can keep with the science

age which changes and grows up at any moment and can benefit from the latest technological inventions in every field and to teach the necessity of the science in all technological inventions and developments.

Today CAI activities exploit improved technology to produce highly interactive learning environments, providing effective support for the acquisition of listening, speaking, reading and writing skills. CAI researchers explore and evaluate these new instructional options to establish a relationship between education and computers by finding the answer to the question 'How can these be best integrated into an effective pedagogy?' Learning through Computer Aided Instructions (CAI) is a relatively new and rapidly evolving concept in academic field that explores the role of Information and Communication Technologies in teaching and learning process.

The researcher goes through various research studies related to the field of Computer-assisted instructions and education. Some of the studies are: Kulik, Bangert, and Williams (1983) analyzed 48 studies on the effect of computer-based teaching on secondary school students in mathematics and science. Thirty-nine of these studies reported that the students with computer-based teaching scored better in final examinations than the students in conventionally taught classes. The other nine studies reported that the students in conventionally taught classes scored better in final examinations. Kumar and Kumar(2013) found CAI more effective than the traditional method of teaching in terms of achievement of pupil-teachers in educational psychology. Chaudhury (2014) conducted an experimental study on the 'Effectiveness of Computer Assisted Instruction in Teaching Physical Sciences in Secondary School of the Rural Area of Burdwan District, West Bengal'. This study revealed that CAI with simultaneous discussion was more effective than the traditional method of teaching. Modi (2014) conducted a study to compare the effectiveness of teaching through CAI and traditional method of teaching on the achievement of secondary school students and made the conclusion that students taught through CAI performed better than the students taught through traditional teaching. He also found that the performance of the girls was better than the boys while using the CAI.

The studies discussed above revealed that teaching through CAI is more effective than the traditional method of teaching. But most of the studies were carried out in the area of teaching science and mathematics etc. However, the researcher could not trace sufficient studies investigating the effectiveness of CAI in Geography. Therefore, the investigator has decided to conduct the present study with the following objectives:

OBJECTIVES OF THE STUDY

1. To compare the effectiveness of CAI over the traditional method of teaching geography in terms of achievement of senior secondary students.
2. To compare the effectiveness of CAI on the achievement of male and female students in geography.

HYPOTHESIS OF THE STUDY

The following null hypotheses were formulated for the present study:

1. There is no significant difference between the achievement of the students in geography taught through CAI and traditional method of teaching.
2. There is no significant difference between the achievement of male and female students in geography taught through CAI.

SAMPLE

The purposive sampling technique was used to select the sample. The sample of this pilot study comprised of 40 students studying in class 11th of Govt. Sen. Sec. School, Bhateri (Kurukshetra) of Haryana. The students were randomly assigned to control and experiment groups. Each group consisted of 10 male students and 10 female students.

TOOLS USED FOR THE STUDY

1. The instructional material on the topics of 'Interior of the Earth', 'Minerals & Rocks'and 'Impact of Exogenic forces on earth crust' in the form of CAI for teaching geography to 11th class.
2. Achievement test on the above topics of Geography.

STATISTICAL TECHNIQUES USED

The following statistical techniques were used to analyze the obtained data:

1. Descriptive statistics used as the mean and standard deviation to understand nature of data.
2. Inferential statistics: t-test was employed to analyze the data.

DESIGN OF THE EXPERIMENT

Control group posttest only design was used to conduct the study. Students were randomly assigned to both the groups. The schematic description of research design is as follows:

Group	Treatment	Posttest
Control (R)	O	T_C
Experimental (R)	X	T_E

Where:

R is randomization

O is treatment given to experimental group by traditional method of teaching

X is treatment given to experimental group by CAI

$\mathbf{T_C}$ denotes posttest scores of control group

$\mathbf{T_E}$ denotes posttest scores of experimental group

PROCEDURE FOR CONDUCTING THE EXPERIMENT

Firstly, the investigator randomly assigned the students to both the groups i.e. Control Group and Experimental group. Then the experiment was conducted in the second week of April. He taught the control group with the traditional method of teaching for a week in a period of 45 minutes daily. The experimental group was exposed to CAI for a week, 45 minutes daily. For maintaining the discipline in the computer laboratory the help of computer teacher was sought. After seven days of teaching to both the groups, the achievement test was administered to both the groups after a gap of two days.

All the measures were taken to keep secret from the students that they are under experiment and the group to which they belong as well as no sharing of information occurred from one group to another.

RESULTS

➢ SIGNIFICANCE OF DIFFERENCE BETWEEN MEAN ACHIEVEMENT SCORES OF CONTROL AND EXPERIMENTAL GROUPS ON ACHIEVEMENT TEST IN GEOGRAPHY

The hypothesis H1 i.e. 'There is no significant difference between the achievement of the students taught through CAI and traditional method of teaching' was analyzed on the basis of the design. Table 1.1 indicates the mean, standard deviation and t-values for control and experimental groups.

Table 1.1

Group	Number	Mean	Standard Deviation	't' Value	Remark
Control	20	32.05	3.10	7.52	Significant
Experimental	20	37.70	1.30		

As shown in Table 1.1 that there is a difference between the mean achievement scores of the students taught through CAI and traditional methods. The mean value of control group in 32.05 and the standard deviation is 3.10 whereas the mean value of the experimental group is 37.70 and the standard

deviation is 1.30. So the mean achievement score of the experimental group is more than that of the control group; which means the performance of the experimental group is better than the control group.

The calculated t-value for the said groups i.e. 7.52 is more than the tabulated value 3.56 at 0.05 level of significance. Thus hypothesis H1 that 'There is no significant difference between the achievement of the students taught through CAI and traditional method of teaching' is rejected. In other words, we can say that there is a significant difference in the achievement of students in the two groups (control group and experimental group). So it can be concluded that CAI is more effective than the traditional method of teaching geography to senior secondary students.

- **SIGNIFICANCE OF DIFFERENCE BETWEEN MEAN ACHIEVEMENT SCORES OF MALE AND FEMALE STUDENTS TAUGHT THROUGH CAI**

The hypothesis H2 i.e. 'There is no significant difference between the achievement of male and female in geography students taught through CAI' was analyzed on the basis of the design. Table 1.2 indicates the mean score, standard deviation and t-values for the achievement of male and female students.

Table 1.2

Group	Number	Mean	Standard Deviation	't' Value	Remark
Boys	10	37.30	1.33	1.41	Not Significant
Girls	10	38.10	1.20		

Table 1.2 depicts that the mean achievement score of male students is 37.30 and the standard deviation is 1.33 while the mean achievement score of the female student is 38.10 and the standard deviation is 1.20. This indicates that the performance of female students is slightly better than the male students in geography while teaching with CAI. But the calculated't' value is 1.41 which is not significant at the 0.05 and 0.01 level of significance. So the formulated null hypothesis H2 i.e. 'There is no significant difference between the achievement of male and female in geography students taught through CAI' is accepted. In other words, we can say that teaching geography through CAI is equally effective for male and female students.

DISCUSSION OF RESULTS

The results of the study are also supported by the studies conducted by Worthen, Van Dusen and Sailor (1994), Christmann, et.al. (1997), Daniel (1999), Soe, Koki and Chang (2003), Traynor (2003), Joy and Shaiju (2004) and Sharma and Sharma (2013). All these studies also found that CAI is more effective than the traditional method of teaching.

MAIN FINDINGS

On the basis of analysis of data the main findings of this pilot study are:

1. There is a significant difference between the mean gain scores of the Control group taught through the traditional method and the Experimental group taught through CAI.
2. CAI was found more effective than the traditional method of teaching geography in terms of the achievement of the 11th class.
3. There is no difference in the achievement of male and female students taught through CAI.
4. CAI was found equally effective for teaching geography to male and female students.

EDUCATIONAL IMPLICATIONS

The finding of the present study shows that the learning modules produced higher learning outcome on pupil achievement in the subject Geography since it is a self- instructional learning material, it provides an opportunity for self-learning and self-evaluation. A number of Computer Assisted Instructions learning modules can be prepared in different subjects. The teacher must be given sufficient

training and encouragement in preparing the CAI module. Theoretical and practical aspects of CAI should be included in pre-service and in-service training programme for the teacher.

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