Effect of CAI on Science Achievement of Higher Primary Students

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Abstract

In this research paper, it has tried to bring a definition of CAI and types of it. Also due to importance of CAI in teaching and learning process and more clearly on academic achievement of students, it has done the teaching by CAI software package in Science subject for 3 months and in higher primary schools of Ahwaz city in Iran and from 200 students (boys and girls). It has collected around 200 academic achievement scores in science subject in form of pre-test and post-test from two different groups (control and experimental group). Pre-achievement scores in science in pervious semester and non verbal intelligence scores have obtained as co-variates for the study. It has analyzed the results which has compared between two groups with respect to academic achievement in science subject. The result revealed that CAI software package has effect on academic achievement in science subject of students in experimental group and scores of students in experimental group were higher than the students who were teaching by traditional method in control group and also the results revealed that there is no significant difference between boys and girls in academic achievement scores in science of experimental group after implement the CAI software package teaching method and both of two groups have been got higher scores in science subject.

Keywords: Teaching methods, computer, software training, Gender, academic achievement

Introduction

In recent years, computers have become an important tool for instruction. Traditional teaching in the classrooms using blackboards can be supplemented with lessons prepared with the help of computers. Good teachers all over the world have always been looking for more effective teaching aided. To realize the vast potential of computers as a tool for education, effort is required in the direction of thinking of how to use the computers as a teaching aid and consequently develop appropriate software for the subject matter. Computer is an impersonal machine system which can help wonderfully to handle information needed to request, report and interpret data. Various curricular subjects can be taught with the help to computers by making use of computer aided instruction. The term CAI refers to the system of providing on-line direct interactive instruction, testing and prescription. The students can be presented with assignments, problems, exercises etc with the help of CAI.

Advantages of CAI

The advantages of CAI can be listed as follows:

- The capability of individualizing both the means and the ends of instruction.
- The capability of doing research on teaching under controlled conditions and, in particular, under conditions which individualize instruction in a particular way.
- The capability of doing research on various modes of teaching, with the ability to collect detailed records of student performance permitting evaluation of the effectiveness of the teaching procedures, as well as the effectiveness of the materials.
- The capability of developing ways of assisting teachers and authors in the development of instructional materials.
- The capability of evaluating alternative media used to implement and support instruction and etc.
- Also some more advantages of CAI are there which we can include them as follows Allessi & Trollip 2005)
- Interaction with the learner is provided.
- Immediate feedback is provided on answers to questions.

- Different avenues are available for students with different interests and learning styles.
- Sufficient opportunities are engendered for the drilling and practice of skills.
- Learners can work on tutorials independently on their own time.
- Simulations can be included.
- CAI can be useful when large numbers of students are involved.

Other advantages are listed as follows (Goel, D.R and Tomar, Archana, Khirwadkar, Anjali & Das, Anshuman, Joshi, Priya 2001):

- A teacher generally addresses a whole class and does not have time for individual queries while a student with a computer can interact with the software.
- Using CAI, the student learns at his own pace. Thus both gifted and slow learners feel satisfied.
- A good CAI can take student towards a guided discovery and so can be creative.
- A visual interactive impact is more easily grasped by the students and retained for a longer time.
- Self evaluation and feedback mechanism help the students immensely.

In spite of the varied advantages of CAI it is found that they are not teaching/learning adequately explored for the reasons could be the cost of computer, lack of infrastructure availability of software, training of teachers, and lack of time. The specific hypotheses to be tested were as follows:

- ➢ The experimental group is significantly higher than the control group in science achievement scores among VIII standard students after use of CAI based software package.
- ➢ There is no significant difference between boys and girls of VIII standard students in science achievement scores after use of CAI.

Method

Participants

In this study 8 standard students (Boys and Girls) were selected for exposure to the CAI software package in Science subject, in the control group students had taught by traditional method which was teacher, class and chalk, blackboard, but the experimental group had taught by CAI software package. In order to study the effectiveness of the developed CAI two types of research design were utilized. Two groups, control group and experimental group randomly selected for boys' school design and two groups Pre-test and Post-test in science achievement in control group and experimental group for girls' school design. The pre-achievement scores in science of students in pervious semester and non-verbal intelligence test scores (SPM) have been obtained as co-variates for this research study. The educational software in science subject was referred to a software program which was included an explanation of all contents of science subject textbook with animation, description of examples and answer all practical questions, self – evaluation for each part of textbook at the end, questions samples for final exam at the end of the textbook and some entertainment in forms of game, conversation, story and drill. This was noticed to be known that the educational software was used in this study had been created in association with ministry of education in Iran and all higher primary schools (middle) are using this software to teach science along with teaching teacher in the classroom. This software has been created by ministry of education and no one before has used it for its research and firmly has approved by educational technology experts. The software has created on usual standard to produce educational software.

Results

The table 1 indicates that the mean score of the post-test in science achievement of the experimental group was 17.04 and that of the control group was 16.45 (respectively), so it indicated that the mean sores of post-test in experiment group is more higher than post-test of control group. Also, Table 2 the result from an ANCOVA analysis include data on the post-test science achievement scores for the experimental and control groups after using the Pre-achievement scores in science in previous semester and non verbal intelligence (SPM) as co-variates. Data indicated that the gain scores of students in the experimental group were significantly higher than the control group $F(1, 196) = 21.486$. $p < 0.01$.

Table 1 mean and standard deviation scores in attitude towards science between experiment and control groups

Group	Mean	Std. Deviation	N
Experimental	17.04	2.33	100
Control	16.45	2.69	100
Total	16.74	2.53	200

It is evident from the above table that: the value of ('t' = -.143, p<.887) is not significant at 0.05 significance. So there is no significant difference between boys and girls of VIII standard students in science achievement scores after use of CAI. So the hypothesis (H2) is accepted.

Table2: science achievement results from ANCOVA – Control and Experimental

Source of variation	sum of squares	df	Mean square	F	Sig.
PRESCORE	141.809	1	141.809	46.916	.000
RPM	76.160	1	76.160	25.197	.000
GROUP	64.943	1	64.943	21.486	.000
Error	592.426	196	3.023		
Total	57351.000	200			
Corrected Total	1271.995	199			

Table 3 't' value for the CAI software package in experimental group on Science Achievement No significant at 0.05

	t-test for Equality of Means			
	t	df	Sig. (2-tailed)	Mean Difference
Science Achievement	**-.143**	98	.887	-.0600

No significant at 0.05

Discussion

Differences between experimental and control group in term of Achievement in science

The achievement in science scores of students were significant difference in experimental group after treatment and it indicates that CAI software package has firmly effect on achievement in science scores of students,

Differences between boys and girls in term of achievement in science in experimental group after treatment

The results have shown that there is no significant difference between girls and boys in term of achievement in science after treatment and it indicates that both have got higher scores in achievement in science which it means that the CAI software package in science subject has equally affected on boys and girls and the gender factor does not have its effectiveness on achievement in science scores of students.

Conclusion

Although computer is used and recognized as a versatile medium for providing instructions, still a kind of fear was felt among the teachers about the supremacy of computerized instruction. The teacher had initial inhibition towards the computers, but when they saw students enjoying and inquiring about their doubts, they gave away their inhibitions. They found that however good the software package is there will always be need of teachers. They realized need and importance of computer software for teaching and learning. Computer aided instruction / computer assisted instruction material more or less has not been utilized at the school level. Through many attempts have been made to develop CAI and study its efficacy and effectiveness. Educational vision of optimum utilization of media such as computer in instruction can be realized not merely through financial and material support only but adequate supportive inputs in the form of training are immediately required for integration of desired curricula.

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