Effect of Computer Assisted Instruction on Achievement in English in Relation to Creativity

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Abstract

The present study investigates the effect of computer assisted instruction on achievement in English in relation to creativity. The sample was drawn of IXth class students taken from two different schools of Chandigarh, affiliated to CBSE, New Delhi. Instructional material based on computer assisted instruction were prepared and implemented to the experimental group after pre-testing and gain scores were computed after post- test for all the students. Creativity test was also administered. A 2×3 two way analysis of variance was used to arrive at the following conclusions: (i) Computer assisted instruction group was found to attain significantly higher achievement scores as compared to control group,(ii) Performance of high creativity group was higher than that of average and low creativity groups. (iii) Significant interaction effect was found between the two variables.

Introduction

Computer assisted instruction was considered the technological phenomenon to revolutionize education and training. Today, the internet and computer technology are reported to have significantly altered the education landscape (Johnson & Aragon, 2002). The rapid advances in technology, the need for lifelong learning, and the growth of nontraditional students have encouraged the use of the computer as a method of instructional delivery. Evaluating the effectiveness as a whole technology is very difficult. The inability to measure effectiveness is attributable, in part, to the fact that it is not just one component, but a complex range of services and activities carried out for instructional and learning purposes (Gibbons & Fairweather, 2000).

With the advances of the technology and software surrounding the internet, the conversion of courses from traditional face-to-face instruction into Web-based courses has become easier and is occurring more systematically in education (Jiang & Ting, 1998). Johnson and Aragon (2002) have begun developing a framework for instructional strategies for use in the computer learning environment. They also found a lack of evidence that technology significantly influences the learning process. They hypothesized that quality learning environments should be based on instructional principles that are derived from multiple learning theories. The challenge is to devise ways to create pedagogically sound content for delivery by the computer. The information to be learned needs to address variability in learning styles, provide motivation, and promote interactivity. They also suggest that the learning environment should be comprised of the elements in behavioral, cognitive, and social learning theory.

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Hannafin and Hughes (1986) argue that the issue with computer research should be how to best utilize computers to redefine, support, or compliment teaching and/or learning efforts rather than if computers are effective in promoting learning. Learners often experience difficulty accessing important lesson content due to poorly integrated knowledge or the complexity of lesson presentations. Some are easily disoriented because of the lesson structure, while others are unable to deal with the cognitive demands associated with increased decision making in hypermedia learning environments (Jonassen, 1989). Although computer-based instruction is often rich in opportunities for students to interact and receive feedback, designers often neglect to provide students with the support supplied by effective classroom teachers (Hawk & Jonassen, 1985). To support the learner, orienting activities are often provided to establish expectancies for and perspectives on, forthcoming lesson content.

English achievement plays a very important role in the attainment of harmonious development of a student. In this rapidly changing world and with the growing advancement in science and technology. The place of English has become so vital that every parents sets high goals for the students to achieve. Achievement thus means all those behavioral changes, which takes place in the individuals as results of learning experience of various kinds. English achievement refers to the degree or level of success or proficiency attained in some specific area concerning English. In general it refers to the score obtained in the annual exams. Megargee (2000) stated that achievement tests how well students have mastered the subject matter in a course of instruction.

Most of the creativity authors concentrate on defining and assessing the level (capacity) of problem solving and creativity. Every teacher and student is creative to a greater or lesser extent. According to experts, personal creativity could be measured in different ways. Very often Torrance tests or different variants are used to measure the level of creativity (Torrance, 1974). Researchers have uncovered that individuals not only differ in the level (capacity) of creativity, but they also differ in their style of creativity. It is obvious that how well one can solve a problem (level) is not the same as in what way it is done (style). Therefore, individuals who possess an equal level of creativity can demonstrate their creativity in different ways (Puccio, 1999).

Creativity and the assessment of creativity is the crucial to society. It is the classification variable in the present research work. Creativity has five dimensions i.e. originality, fluency, flexibility, convergent thinking and divergent thinking are often surprising. Responses given by less than five percent of the groups are treated as original. Fluency means number of relevant and unrepeated ideas, which tests produce in response to a problem or scenario. Flexibility means person's ability to produce ideas which differ in approach or thought trend. In other words it is the ability to generate different kinds of ideas. All ideas which fall under one category of approach trend are treated as one for the purpose of flexibility scoring. Convergent thinking is the type of

ordinary thinking in which the majority

of people engage. Divergent thinking is the thinking that results into new, different responses that most people do not offer. This type of thinking involves creativity (Messick, 1976).

Need and Significance of the Study

The purpose of the study was to conduct research regarding the perceptions of students studying with computer assisted instructions to solve the problem in English. Computer assisted instructions promotes learning because these collaborative experiences engage students in an interactive approach to processing information, resulting in greater retention of subject matter, improved attitudes towards English and enhance interpersonal relation among group members. The students are likely to attain higher levels of achievements, to build life-long interaction and communication skills, and to master the habits of mind (critical, creative and self regulated) need to function as productive members of society. Adopting proper teaching strategies help teachers in solving learner's problems. Review of the literature shows that use of computer assisted instructions gave quite positive results in comparison to traditional teaching methodology. English is one of the most important subjects in science and contains a number of abstract concepts requiring complex concepts many of which are not obviously applicable outside the classroom. For this reason students view English as one of the most difficult subjects at all levels of schooling. Over the last two decades, a great deal of educational research has been conducted to determine student's alternative conceptions and difficulties in English. Some current research has sought to investigate the underlying causes of difficulties with complex topics and this research also seeks to develop curricula to help students overcoming difficulties and develop capacity for clear thinking which distinguishes every truly educated person. Therefore, the investigator made an attempt to inquire the effect of computer assisted instruction on achievement in English in relation to creativity.

Objectives

1. To compare the achievement of groups taught through computer assisted instruction and traditional method of teaching in English.
2. To examine the achievement of groups having different levels of creativity.
3. To examine the interaction effect between computer assisted instruction and traditional method of teaching in English.

Hypotheses

H_1 The performance of group taught through computer assisted instruction is higher than the traditional method of teaching in English.

H_2 The performance of high creativity group is be higher than that of average and low creativity group.

H_3 The performance through computer assisted instruction group does interact with creativity group in English.

Methodology of the Study

It is necessary to adopt a systematic procedure to collect the necessary data which helps to test the hypotheses of the study under investigation. Various steps of research methodology followed in the present study are as follows:

Sample

The study was conducted on a random sample of 100 students of IXth class, both boys and girls English students including 50 students from Government Senior Secondary School, sector-38, Chandigarh and 50 students from Government model high school, Government Senior Secondary School, sector-37, Chandigarh. It was random and purposive sample. The study was conducted on two intact groups viz. one is experimental group and other is control group in each school. The two schools were randomly selected from the total school of Chandigarh from each school the two intact sections of 25 students were selected.

Design

For the purpose of present investigation, a pre and post-test factorial design was employed. In order to analyze the data, a 2×3 analysis of variance was used for the two independent variables viz. instructional treatment and creativity levels. The impact of teaching strategy was examined at two levels, namely computer assisted instruction and traditional method of teaching. The creativity group was operating at three levels viz. high, average and low creativity. The main dependent variable was performance gain which was calculated as the difference in post- test and pre-test scores for the subject.

Tools used

The following tools were used for the collection of data:

1. Verbal Test of Creativity Thinking by Mehdi (1973) was used to identify the creative levels of the students.
2. Achievement Test in English was prepared by the investigator.
3. Instructional Material in English based on computer assisted instruction and traditional method of teaching was prepared by the investigator.

Procedure

After the selection of the sample and allocation of students to the two instructional strategies, the experiment was conducted in four phases. Firstly, the verbal test of creative thinking was administrated in each school, in order to identity creativity levels of the students. Secondly, a pre-test was administered to the students of both the treatment and control groups. The answer-sheets were scored to obtained information regarding the previous knowledge of the students. Thirdly, one group was taught through

computer assisted

instruction and control group was taught through traditional method of teaching by the investigator. Fourthly, after the completion of the course, the post- test was administered to the students of both the groups. The answer-sheets were scored with the help of scoring key. Time limit for the test was one hour.

Analysis and Interpretation Of The Results

Analysis of Descriptive Statistics

The data were analyzed to determine the nature of the distribution of scores by employing mean and standard deviation. The two way analysis of variance was used to test the hypotheses related to strategies of teaching and creativity levels. The mean and standard deviation of different sub groups have been presented in table- 1 & 2.

Table- 1: Means and SD of Achievement Scores for the Different Sub GroupsTable-1: Means and SD of Achievement Scores for the Different Sub Groups

	Teaching								
	Computer Assisted Instruction			Traditional Teaching					
Creativity Level	N	Mean	SD	N	Mean	SD	Total		
High Creativity	13	10.31	1.98	13	6.53	2.62	26	8.42	2.99
Average Creativity	24	4.83	1.80	24	4.42	2.52	48	4.63	2.20
Low Creativity	13	5.39	2.53	13	3.23	1.37	26	4.31	2.30
Total	50	6.40	3.02	50	4.66	2.62	N= 100		

Source: Field Study, 2015

It may be observed from the table-1 that the mean scores of computer assisted instruction of experimental group (M=6.40) is higher than the control group was (M=4.66). This shows that computer assisted instruction group was more effective than the traditional method of teaching. It is also confirmed that the mean of the three groups i.e. high, average and low creativity group is 8.42, 4.63 and 4.31 respectively. It is concluded that the gain mean has shown significant differences for high, average and low creativity students. These differences are also found in respect of the different creativity group taught through conventional method of teaching.

Analysis of Variance on Achievement Scores

The mean of different sub-groups, sum of squares, degree of freedom, mean sum of squares and the F - ratio have been presented in table - 5.

Table -5: Summary of Analysis of Variance (2×3) Factorial Designs

Source of Variance	Sum of Squares	df	Mean Sum of Squares	F- ratio
Computer Assisted Instruction (A)	75.69	1	75.69	14.93**
Creativity (B)	295.77	2	147.89	29.17**
Interaction (A X B)	48.89	2	24.45	4.82*
Within Group	476.56	94	5.07	-

*** Significant at 0.01 level* **Significant at 0.05 level*

(Critical Value 3.94 at 0.05 and 6.90 at 0.01 level, df 1/94)

Main Effects

Computer Assisted Instruction (A)

The table -5 shows that the F-ratio for difference in mean gain scores of computer assisted instruction and traditional method of teaching group is 14.93, which in comparison to the table value was found significant at 0.01 level of significance. It shows that the groups were not different beyond the contribution of chance. Hence, the hypothesis H1 i.e. the performance of group taught through computer assisted instruction was higher than the traditional method of teaching in English, is accepted at both levels. The result indicates that the performance of computer assisted instruction group is higher than that of traditional method of teaching group in English.

Creativity Groups (B)

The table-5 observed that the F-ratio for difference in mean of three groups of creativity level are 29.17, which in comparison to the table value was found significant at 0.01 level of significance. It suggests that the three groups were different in respect of achievement scores. Hence, the hypothesis H2 i.e. the performance of high creativity groups is higher than that of average and low creativity group, is accepted at both levels. The observed difference may be attributed to the chance factor. The result indicates that the high creativity group was more effective than the average and low creativity group when we taught through computer assisted instruction of teaching.

Interaction Effect (A × B)

The table-5 shows that the F- ratio for interaction between computer assisted instruction and creativity groups is 4.82, which in comparison to the table value was found significant at 0.05 level of significance. Thus, the hypothesis H3 i.e. the performances through different model of teaching will interact with creativity level, is accepted at the 0.05 level. The result indicates that the computer assisted instruction and creativity levels do interact with each other.

Discussion

The result of the present investigation have lead to the conclusion that computer assisted instruction was found more effective than the traditional method of teaching. Hence, the hypothesis H1: The performance of group taught through computer assisted instruction is higher than the traditional method of teaching in English, is accepted. These results were consistent with the finding of Liao (2004) suggested that the effects of computer assisted instruction are positive over traditional instruction. Basturk (2005) found that participants in lecture plus-computer assisted instruction sections obtained higher averages. Akcay (2006) found significant differences between control group and both experimental groups and between experimental groups on computer attitudes and analytical English attitudes were found. Pilli (2008) and Yusuf and Afolabi (2010) found the significant difference between the experimental group and control group which was higher in case of experimental group. Mehar and Kumar (2013) found use of audio-visual aids was more effective than the traditional method of teaching. Kareem (2015) found that a statistical significant difference existed between student's achievement and mode of instruction.

The findings of the present study revealed that there was significant difference between mean gain scores of high creativity group is higher than that of average and low creativity groups. Hence the hypothesis H2: The performance on high creativity group is higher than that of average and low creativity groups, is accepted. The result was consistent with the findings of Serin (2011) revealed significant difference in experimental group that received computer assisted science and technology instruction. However, the findings of the present study was not consistent with the findings of Anwar, Shamim-ur-Rasool and Haq (2012) concluded that there was no significant difference between high achievers and low achievers in terms of creative thinking abilities. Mehar and Kumar (2013) found that high creativity group was more effective than that of Average and low creativity group.

The findings of the present study also reveal that there was significant interaction between computer assisted instruction and creativity levels. Hence the hypothesis H3: The performance through computer assisted instruction does interact with creativity levels, is accepted. The result was consistent with the findings of Mehar and Kumar (2013) found that significant interaction between audio visual aids and creativity. Olsson (2014) found that features of geogebra like multiple representations and providing of feedback guided the student's into creative mathematical reasoning. Clarke (2015) found traditional instructions in English have presented limited opportunities for creativity and decision making.

Conclusion

The present study reveals that performance in English grammar of students

taught through computer assisted instruction was significantly higher than those which were taught through conventional model of teaching. The gain mean with different teaching method at

different creativity groups do differ to each other. Further, the gain means with computer assisted instruction has shown significant differences for high, average and low creativity students. However, the difference in mean score for interaction across different grouping did turn out to be significant. The study recommends the use of computer assisted instruction for better performance of English students at secondary stage.

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