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EFFECT OF COMPUTER BASED MULTIMEDIA INSTRUCTIONAL STRATEGY ON ACHIEVEMENT IN ENGLISH IN RELATION TO COMPUTER ANXIETY

Gagandeep Kaur

Abstract

The present study investigates the effect of computer based multimedia instructional strategy on achievement in English in relation to computer anxiety. The sample was drawn of IX class students from schools of Amritsar District affiliated to CBSE. Instructional material based on computer based multimedia instructional strategy was prepared and implemented to the experimental group after pre-testing and gain scores were computed after post-test for all the students. The computer anxiety scale was also administered. A 2x2 two way analysis of variance was used to arrive at the following conclusions: (i) Group taught through computer based multimedia instructional strategy was found to attain significantly higher achievement scores as compared to control group. (ii) Performance of students with low computer anxiety was found better than high computer anxiety group. (iii) No significant interaction effect was found to exist between the two variables.

INTRODUCTION

The computer has become one of the most central components of our modern culture. One of the most pervasive aspects of computing is multimedia. “Multimedia is the combination of a variety of communication channels into a co-ordinated communicative experience for which an integrated cross-channel language of interpretation does not exist” (Elsom- Cook 2001, p.7). Development, access and transfer of text, sound, and video data have given a unique face to classrooms, libraries, training and resource centers, in the form of interactive multimedia programs. The use of multimedia technologies in educational institutions is seen as necessary for keeping education relevant to the 21st century (Selwyn & Goddard 2003, p.169).

Multimedia technology has made rapid strides and today encompasses almost all areas of human activity. The capability of storing text, images, sound, and video on a single platform is forcing people to review their databases and augment them in future; a database will be incomplete without multiple media. The energy and excitement that multimedia has released in art and humanities faculties is leading to a birth of new synergies between the computer scientists and the domain experts. Multimedia is the integration of more than one medium into some form of communication or experience delivered via a computer. Most often, multimedia refers to the integration of media such as text, sound, graphics, animation, video, imaging, and spatial modeling into a computer system (Von Wodtke, 1993).

Multimedia in a computer environment implies a combination of various media, text, video, images, and audio, or a combination of any two of these, and may be linear or non-linear (Sutton, 1999). Multimedia can be defined as an integration of multiple media elements (audio, video, graphics, text, animation, etc.) into one synergetic and symbiotic whole that results in more benefits for the end user than any one of the media elements can provide individually (Reddi 2003, p.3).

The central theme is that the integration of multimedia technologies will lead to a transformation of pedagogy from traditional inductivist teacher-centered approaches to the more desirable constructivist learner approaches that are seen as embodying essential characteristics of more effective learning environments (Tearle, Dillon & Davis, 1999; Relan & Gillani, 1997; Willis & Dickinson, 1997; Lefoe, 1998; Richards & Nason, 1999). From the learner-centered perspective, the teacher’s role changes from the traditional (instructivist approach) role of instructor and supplier of knowledge to a role more closely aligned with support and facilitation of the active construction of knowledge by the learner (Tearle, Dillon & Davis 1999, p.5). The learner-centered approach implies
empowerment of the individual learner and the ability to provide the learner with self-directed, more meaningful, authentic learning experiences that lead to lifelong learning.

The availability or lack of a surrounding community of English speakers outside the classroom affects learning and teaching of English as a foreign language (EFL). When there are no English speakers easily available outside the classroom, it makes English as a foreign language learning and quality teaching more challenging (Parker, Heitzman, Fjerstad, Babbs & Cohen 1995, p.235). Because of this, the most successful English as a foreign language pedagogies attempt to replicate the target language’s environment, usually through technology-assisted teaching, bilingual curricula, and immersion programs (Lapkin, Swain & Shapson, 1990).

Underwood (1990) explained the effectiveness of multimedia in language acquisition and claimed that since multimedia users are able to process combined media (text, sound, and visual) simultaneously, proponents of instructional multimedia have argued that the increase of sensorial input available via technology coupled with the potential for active engagement in, and interaction with this input predicts that content (in this case the target language) will be more readily integrated into learner’s developmental system and, in turn, recalled more thoroughly. Moreover, Mayer (1997) indicated that the presence of both pictorial and verbal cues can facilitate learning and also claimed that if information is cognitively processed through visual or verbal channels, a dual processing strategy assumes individuals’ developmental pictorial representations of graphic input and mental verbal representations of linguistic input.

Computer anxiety is a concept-specific anxiety because it is a feeling that is associated with a specific situation, in this case when a person interacts with computers. Computer anxiety is “the anxiety that people feel they will experience when they are interacting with computers-the anxiety associated with the concept of computers” (Oetting 1983, p.1). Herdman (1983) defined computer anxiety as emotional fear, apprehension, and phobia felt by individuals towards interactions with computers or when they think about using computers. Cambre and Cook (1985) stated that computer anxiety is a form of state anxiety, and it was brought on in part by the rapidly changing nature of new technology and the subsequent pressure for social change in modern time. Howard and Smith (1986) defined computer anxiety as “the tendency of a particular person to experience a level of uneasiness over his or her impending use of a computer” (p. 18). Heimssen, Glass and Knight (1987) stated that computer anxiety refers to negative emotions and cognitions evoked in actual or imaginary interactions with computer-based technology, and it affects the utilization of computer-based technology and performance on tasks that involve the use of computers. Rosen and Weil (1990, 1995) described computer anxiety as “technophobia” and used the term “cyberphobia” to describe individuals who are frightened by the use of computers and technology. Computer anxiety has also been classified as a complex psychological construct that cannot be fully described from a single perspective (Chua, Chen & Wong 1999, p. 611). They simply generalized the definition of computer anxiety as “a kind of state anxiety, which can be changed and measured along multiple dimensions”.

Necessary and Parish (1996) found that college students with little or no computer experience have more anxiety than those students who have computer experience. The result of their study revealed that increased levels of computer experience and balance of weekly computer usage were both related with reduced levels of computer related anxiety. Glass and Knight (1988) determined that computer anxious students will become less anxious after an initial trauma period. It is reasonable to assume that by increasing computer usage thereby experience one would reduce anxiety yet for those who are computer anxious this may prove to be difficult because there are varying degrees of anxiety, those who are highly anxious may completely avoid computers.

NEED AND SIGNIFICANCE OF THE STUDY

The current age of 21st century, which is well known as Information Age has brought a paradigm shift in our school systems from traditional methods of teaching to modern method of teaching which encompasses the use of technology. The modern technology aids in improving the teaching learning techniques. Shinn (2001) asserted that for a school to remain competitive it also must adapt to changes and be innovative with its use of computer. Schools spend a great amount of money on computer-based education and training each year. The increase in computer usage is rapid and has also generated new challenges. Computer anxiety can be one of the major problems that affect
the effectiveness of learning. Therefore, the investigator made an attempt to enquire into the effectiveness of computer based multimedia instructional strategy on achievement in English in relation to computer anxiety.

DELIMITATION
The study was delimited to IX class English students from four schools affiliated to CBSE of Amritsar district only.

OBJECTIVES
1. To compare the achievement of groups taught through computer based multimedia instructional strategy and conventional teaching strategy.
2. To compare the achievement of high and low computer anxiety groups of students.
3. To examine the interaction effect of instructional strategies and computer anxiety.

HYPOTHESES
H1O: The achievement of group taught through computer based multimedia instructional strategy will be significantly higher than that of group taught through conventional teaching strategy in English.
H2O: The achievement of low computer anxiety group will be significantly higher than that of high anxiety group of students in English.
H3O: There exists no significant interaction effect of instructional strategies and computer anxiety on achievement in English.

METHODOLOGY
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 400 IX class English students.

Design
For the purpose of present investigation, a pre-test and post-test factorial design was employed. In order to analyse the data a 2x2 analysis of variance was used for the two independent variables viz. instructional treatment and computer anxiety. The impact of instructional treatment was examined at two levels, namely computer based multimedia instructional strategy and conventional teaching strategy. The variable of computer anxiety was studied two levels viz. high and low computer anxiety groups. The main dependent variable was performance gain which was calculated as the difference in post-test and pre-test scores for the subjects.

Tools Used
(i) An Achievement Test in English Grammar was developed by the investigator herself.
(ii) Instructional Material on Computer Based Multimedia Instructional Strategy in English Grammar was developed by the investigator herself.
(iii) Instructional Material on Conventional Teaching Strategy in English Grammar was prepared by the investigator herself.
(iv) Computer Anxiety Scale was developed by the investigator herself.

Procedure
After the selection of the sample and allocation of students in two groups for instructional strategies, the experiment was conducted in four phases as following:-

Firstly, an achievement test as a pre-test measure was administered on the total sample.
Secondly, The computer anxiety scale was administered in each school of the experiment and control groups. Thirdly, treatment was given to the experimental group. The experimental group was taught through computer based multimedia instructional strategy and the control group was taught by conventional teaching strategy. Fourthly, after the completion of the instructional program, the same achievement test in English grammar was administered as post-test to the students of both the groups. The students were given 45 minutes to complete the test. The answer-sheets were scored with the help
of scoring key. The experiment and control group scores were compared according to their pre-test and post-test scores and difference was called as gain achievement scores of the experiment and control group.

**ANALYSIS AND INTERPRETATION**

The data were analysed 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 computer anxiety. The mean and standard deviation of different sub groups have been presented in Table 1. It was found from the table that the mean scores of computer based multimedia instructional strategy (M=22.42) was higher than the conventional strategy (M=13.75). This shows that computer based instructional strategy was more effective than the conventional teaching strategy. It was also confirmed that low computer anxiety group had higher mean score as compared to high computer anxiety group. It was concluded that the gain mean with computer based multimedia instructional strategy was more for low computer anxiety group than for high computer anxiety group.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Experimental Group</th>
<th>Control Group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>High Computer Anxiety</td>
<td>54</td>
<td>20.11</td>
<td>5.00</td>
</tr>
<tr>
<td>Low Computer Anxiety</td>
<td>54</td>
<td>24.72</td>
<td>7.07</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>22.42</td>
<td>6.52</td>
</tr>
</tbody>
</table>

**Table 2: Summary of Analysis of Variance (2×2) factorial design**

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean of Sum of Squares</th>
<th>F-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achievement in English</td>
<td>Instructional Strategy (A)</td>
<td>3693.89</td>
<td>1</td>
<td>3693.89</td>
<td>79.43**</td>
</tr>
<tr>
<td></td>
<td>Computer Anxiety (B)</td>
<td>357.38</td>
<td>1</td>
<td>357.38</td>
<td>7.69**</td>
</tr>
<tr>
<td></td>
<td>A x B</td>
<td>158.50</td>
<td>1</td>
<td>158.50</td>
<td>3.41</td>
</tr>
<tr>
<td></td>
<td>Error Term</td>
<td>9486.58</td>
<td>204</td>
<td>46.50</td>
<td></td>
</tr>
</tbody>
</table>

**Significant at 0.01 level**  
(Critical Value 3.89 at 0.05 and 6.76 at 0.01 level, df 1/204)

**MAIN EFFECT**

**Instructional Strategy (A)**

It is seen from the table 2 that the F-ratio for difference between the mean gain scores for computer based multimedia instructional strategy and conventional teaching strategy is 79.43, which in comparison to the table value was found to be significant at 0.01 level of significance. This suggested that instructional strategy effect on mean gain achievement scores of two groups was significant beyond the contribution of chance. Thus, the hypothesis H1O: The achievement of group taught through computer based multimedia instructional strategy will be significantly higher than that of group taught through conventional teaching strategy in English, is accepted at specified level. It may thus be concluded that the use of different instructional strategies to impart instruction in English attributed to development of difference in mean gain achievement scores in English.

**Computer Anxiety (B)**

It may be seen from the table 2 that the F-ratio for difference between the mean gain scores for high and low computer anxiety groups is 7.69, which in comparison to table value was found to be significant at 0.01 level of significance. This suggested that computer anxiety effect on achievement scores was signified at the specified level. Hence, the hypothesis H2O: The achievement of low computer anxiety group will be significantly higher than that of high anxiety group of students in English, is accepted. It may be, therefore, concluded that low and high computer anxiety groups were different on mean gain scores on achievement in English.
Interaction Effect (A × B)

It is observed from the table 2 that F-ratio for interaction between instructional strategies and computer anxiety is 3.41, which in comparison to the table value was not found to be significant even at 0.05 level of significance. Hence, the null hypothesis H30: There exists no significant interaction effect of instructional strategies and computer anxiety on achievement in English, is accepted. It may be concluded that there was no difference in the gain scores on achievement in English due to interaction effect of instructional strategies and computer anxiety.

DISCUSSION

The present study revealed that computer based multimedia instructional strategy yielded higher mean gain achievement scores than conventional teaching strategy. The findings were supported by Nishino (1993), Williamson & Abraham (1995), Mackenzie & Jansen (1998), Malliga (2003), Sunder (2006), Vellaisamy (2007), Babu & Vimla (2008), Srinivasalu & Vijayalakshmi (2010), Serin (2011) who all favoured computer based multimedia instructional strategy over traditional method resulting in higher achievement in English.

Interaction effect of instructional strategies and computer anxiety did not yield significant difference in mean gain scores on achievement in English. The investigator could not lay her hand on any study related to this result.

CONCLUSION

The present study reveals that achievement score in English of students taught through computer based multimedia instructional strategy was significantly higher than those which were taught through conventional teaching strategy. Further, the gain means with computer based multimedia instructional strategy was more for low computer anxiety group as against the high computer anxiety group. However, the difference in mean score for interaction across different grouping did not turn out to be significant. The study recommends the use of computer based multimedia instructional strategy for better performance of students.

REFERENCES


