EFFECT OF CAI ON ACHIEVEMENT OF LD STUDENTS IN ENGLISH

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ABSTRACT

The present experimental study was undertaken with three objectives in view, (i) to identify students with language learning disabilities (ii) to develop CAI software to teach LD students through computer-assisted instruction and (iii) to measure the effectiveness of CAI with special reference to LD students. Two matched groups of LD students were constituted for the purpose of this experiment and a normal group comprising average and above average students was also formed in order to assess how far Computer-Assisted Instruction enabled the LD students to cope with normal students. The control group and the normal group were taught through traditional lecture method while the experimental group was taught through Computer-Assisted Instruction. The obtained results show that the computer-assisted instruction was more effective than the traditional lecture method in teaching and learning of English with record to the students with language learning disabilities and it enabled the LD students to cope with normal students to a considerable extent.

Keywords: Computer-Assisted Instruction, Learning Disabilities, Academic Achievement, Progress and Rate of Progress, Strategy Effectiveness.

INTRODUCTION

The problem that every educator invariably encounters in teaching every subject, at every grade level of our educational system is how to teach a lesson to a class that consists of students with different skills, learning rates and learning styles. Accommodating instruction to student differences is one of the most fundamental problems and the foremost task of any teacher. The problem of accommodating instruction to individual differences is so important that many educators have subtly suggested that instruction be completely individualized so that every student can work independently at his or her own rate.

Learning disabled students are defined as, those students who in the absence of sensory defect or overt organic damage have intractable learning problems in one or more of reading, writing, speaking, and mathematics and who do not respond to normal teaching [12]. The language learning disabled students are those students who have disorders in development in language speech, reading and associated communication skills needed for social interaction [6].

These LD students are marked for disorders of attention, hyperactivity and impulsivity, memory disorder, and disorders in listening, reading, writing and spoken language. Besides, these students exhibit poor social and interpersonal skill, visual perceptual deficit, auditory perceptual deficit, and motor deficiencies. As a result, they lag behind in learning and using language [7,10]. Nevertheless, these LD students constitute such a considerable percentage of student population that they cannot be ignored. In addition, one cannot conceive of any all-round national development without ensuring adequate human resource development. Effective and optimum utilization of other resources also depends on the degree of human resource development. Children of today are the citizens of tomorrow and they are going to be the pillars of this country. Hence, it is very essential to ensure that each pillar is as strong as the other is. This warrants a special teaching learning strategy for the LD students. CAI is a viable strategy in this regard.

Computer-Assisted Instruction

Computer-Assisted instruction (CAI) refers to instruction or remediation presented on a computer. Many educational computer programs are available online and from

computer stores and textbook companies. They enhance teacher instruction in several ways. Computer programs are interactive and can illustrate a concept through attractive animation, sound, and demonstration. They allow students to progress at their own pace. Computers provide immediate feedback, letting students know whether their answer is correct.

Need for the Study

Now a days we are passing through the age of information technology wherein knowledge explosion is taking place rapidly in every sphere and new media are being extensively used for transmitting information. Many are unable to keep pace with this phenomenon. This can be attributed to the lack of development of higher mental abilities, self-study habits, initiative on the part of students, etc. The present classroom practice miserably fails to take cognizance of these. Many researchers have made efforts to develop instructional strategies, which attempt to take care of the above inadequacies. These researchers have developed instructional strategies comprising various components for teaching a variety of subjects' right from school to university. Almost all these researchers have studied the effectiveness of their instructional strategies in terms of achievement and reaction of students towards different components of the strategy as a whole. However, adequate studies so far to study the effectiveness of computer-assisted instruction with special reference to LD students have not been attempted.

The CAI programs provide for considerable visualization of objects and processes, which are essential for formulation of accurate concepts. What impact a visual presentation can do, any amount of verbal exposition cannot do. Moreover, in a fast developing world, where knowledge explosion is taking place in every sphere, it is unreasonable to expect that the spoken or written words alone could convey the volume of relevant information to the learners. CAI programs provide unique experience to the learners in the presentation of the content. Computer-assisted instruction can penetrate more deeply into human character with an immediate effect and excitement than any other single medium.

Computer-assisted instruction caters to individual differences. In the traditional classroom setting, the LD students are too inhibited to ask the teacher to clarify a concept or to get a doubt cleared. However, in computer-assisted instruction, even if they do not understand something at the first attempt, they can understand the concept thoroughly by making use of the provision for playback. Besides, they can also take the software to their houses and listen to or view the instructional programs according to their own convenience and thereby learn at their own rate without inhibition or the feeling of being preyed upon by the teacher.

The effectiveness of Computer-Assisted Instruction have been studied and established [1-5, 8-9, 11,13]. But no study has been attempted with special reference to LD students. Systematic researches are, therefore necessary to develop CAI software so as to assess their effectiveness with reference to LD students.

Objectives

The main objective of the study was to develop CAI software for English subject of Class XI and to assess its effectiveness with special reference to LD students. Keeping the above main objective in mind, the following specific objectives were framed.

i) To find out whether there is any significant difference in the performance of control group LD students between pre-test and post-test.

ii) To know whether there exists any significant difference in the performance of experimental group LD students between pre-test and post-test.

iii) To verify whether there is any significant difference in the post-test performance between experimental group LD students and control group LD students.

iv) To assess whether there exists any significant difference in the post-test performance between control group LD students and the normal group students.

v) To measure whether there is any significant difference in the post-test performance between experimental group LD students and the normal group students.

Hypotheses of the Study

I) There exists no significant difference in the performance of control group LD students between

pre-test and post-test, when the subject is taught through traditional lecture method.

ii) There is significant difference in the performance of experimental group LD students between pre-test and post-test when English is taught through computer-assisted instruction.

iii) There exists significant difference in the post-test performance between control group LD students and experimental group LD students.

iv) There exists significant difference in the post-test performance between control group LD students and normal group students.

v) There is no significant difference in the post-test performance between experimental group LD students and normal group students.

Methodology

The various steps followed in the methodology of this study are development of CAI software, construction of research tool, identifying LD students, sampling technique, design of the study, applying computer-assisted instruction for English subject of class XI, administration of tool for pre-test and post-test and employing appropriate statistical techniques for arriving at scientific conclusions.

Development of CAI Software

An earnest effort was made to develop computer software for CAI. A computer expert was consulted for the purpose and it was discussed with him how to develop software for CAI based on the selected concepts / units. Though there are various CAI programs such as "drill and practice program", "tutorial program", "generative program", "dialogue enquiry program" and "simulation program", the investigator decided to follow the first two i.e., drill and practice and tutorial programs since these are the most widely used types of computer programs. Accordingly the CAI software was developed. After validation, it was used in experimental treatment.

Diagrams and sketches were also incorporated in the software in appropriate places through scanning procedure. For concepts and units, different codes were allotted. The software was prepared in such a way that it ensured the following.

1) Letting students work at their own pace.

2) Measuring performance quickly and giving students information on their performance.

3) Providing immediate feedback and reinforcement

Construction of Tool

To measure the performance of the students before and after the experiment, an achievement test was constructed by the investigator on the basis of item analysis. The content validity of the tool by expert opinion, item validity by item analysis and the reliability of the tool by split half method were established.

Identifying LD students

For the purpose of the investigation the LD students were identified based on curriculum based assessment and their performance in the diagnostic tests.

Sample Design

For the purpose of this investigation, 50 LD students of Class XI from S. S. H. N. Higher Secondary School, Muhavur were selected as stated above. Out of the fifty LD students finally selected for the study, two groups were formed following systematic random sampling technique. They were placed in the order of merit. All the odd number students formed the control group while the even number students constituted the experimental group. In order to find whether both the groups were matched ones or not, mean and standard deviation were calculated for their half yearly exam scores. Then t-test was applied. The obtained t-value (0.62) revealed that both the groups were matched ones before the experiment. The control group was taught through the traditional lecture method and the experimental group was taught through active learning strategy.

To assess how far this computer-assisted instruction enabled the LD students to cope with normal students, a normal group comprising average and above average students was also formed. For this group, out of 200 students every eighth student was selected based on systematic random sampling technique. This normal group was also taught through traditional lecture method only.

Data Collection

The experiment was conducted for a period of thirty

working days. At the end of the experimental period, a post-test was conducted to the LD students of the experimental group, the LD students of the control group and the students of the normal group. The responses given by these three groups in pre-test and post-test formed the vital data required for analysis.

Scoring Procedure

The achievement test consisted of 100 objective type questions. These test items were selected because of item analysis. The total score of the test was 100. For each correct answer, the score was one and for each wrong answer, the score was zero.

Statistical Techniques used in the Study

The data thus obtained were then analyzed by using appropriate statistical techniques such as mean, standard deviation, and t-test.

Findings and Conclusions

1) There is no significant difference in the performance of the control group LD students taught through traditional lecture method between pre-test and post-test. Though their performance was better in the post-test, they could not make any significant difference as shown in Table 1.

2) There is significant difference in the performance of the experimental group LD students between pre-test and post-test when the subject is taught through computer-assisted instruction. Further, their achievement is higher in post-test than in pre-test, as shown in Table 2.

Moreover, an analysis of the rate of progress made by both control group and experimental group throws light on the effectiveness of computer-assisted instruction in teaching English to LD students. From a meagre mean score of 20.2 in pre-test, they could gain an impressive mean score of 42.4 in post-test, which is more than double the pre-test mean score. However, the control group LD students could not make significant mean gain in post-test. This vouchsafes the advantage of computer-assisted instruction over the traditional lecture method with special reference to LD students.

Name of the Test	N	Mean	SD	Calculated t-value
Pre-test	25	20.6	5.25	1.62 @
Post-test	25	23.2	6.15	

Note: @ not significant at 0.05 level

Table 1. Pre-test and Post-test Scores Analysis of Control Group LD students

Name of the Test	N	Mean	SD	Calculated t-value
Pre-test	25	20.2	5.21	11.26**
Post-test	25	42.4	8.42	

Note: ** significant at 0.01 level

Table 2. Pre-test and Post-test Scores Analysis of Experimental Group LD students

3) There is significant difference in the post-test performance between the control group LD students taught through traditional lecture method and the experimental group LD students taught through computer-assisted instruction. Further, the achievement of the experimental group LD students is higher than the achievement of the control group LD students, as shown in Table 3.

Moreover, the rate of progress made by the experimental group LD students is higher than that of the control group LD students. In terms of percentage, the rate of progress shown by the experimental group LD students taught through computer-assisted instruction is 109.9 percent, while the rate of progress made by the control group LD students is 12.62 per cent. The variation in the rates of progress made by both the groups is the resultant product of implementation of computer-assisted instruction and it vouches for the effectiveness of computer-assisted instruction with special reference to LD students.

4) There is significant difference in the post-test performance between the control group LD students and the normal group students. Further, the achievement of normal group students is higher than the achievement of control group LD students as shown in Table 4.

Name of the Group	N	Mean	SD	Calculated t-value
Control Group	25	23.2	6.15	9.23**
Experimental Group	25	42.4	8.42	

Note: ** significant at 0.01 level

Table 3. Post-test Scores Analysis of Control Group and Experimental Group LD students

The mean value (23.2) obtained by the control group LD students in the post-test reveals that they could make a meagre mean gain only and they could not narrow down the gap between them and the normal group students. It means that the traditional lecture method could not enable control group LD students to cope with normal students.

5) There is significant difference in the post-test performance between the experimental group LD students and the normal group students. The achievement of normal group students is higher than the achievement of experimental group LD students, as shown in Table 5.

However, a critical analysis of mean values signifies that the experimental group LD students significantly improved their achievement after the experiment. Moreover, the computer-assisted instruction enabled the experimental group LD students to cope with normal students largely. The narrowed down gulf of difference between both the groups bears testimony to the effectiveness of the computer-assisted instruction. Further, a comparative study of Table-4 and Table 5 testifies to the advantage of computer-assisted instruction over the traditional lecture method.

Implications

1) The results of the study have established that computer-assisted instruction is more effective than the traditional lecture method in teaching English of Class XI to the LD students. When it is very effective to the LD students, it has to be equally effective, if not more effective, to other backward students like under-achievers, low achievers, slow learners etc.

Name of the Group	N	Mean	SD	Calculated t-value
Control Group	25	23.2	6.15	14.29**
Normal Group	25	51.6	7.84	

Note: ** significant at 0.01 level

Table 4. Post-test Scores Analysis of Control Group and Normal Group

Name of the Group	N	Mean	SD	Calculated t-value
Control Group	25	42.4	8.12	3.97**
Normal Group	25	51.5	7.84	

Note: ** significant at 0.01 level

Table 5. Post-test Scores Analysis of Experimental Group and Normal Group

2) Since the use of computer-assisted instruction enhances the achievement of LD students, it would diminish wastage and stagnation in our schools. Therefore, necessary orientation may be given at DIET level so that awareness can be created among primary school and high school teachers also and they would be able to identify and combat learning disabilities at the early stage itself.

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