Effectiveness of Computer Assisted Instructional Package as Remedial Teaching for Learning disabled Children

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Abstract

The study determined the effectiveness of Computer-Assisted Instructional package (Games/ Simulations) as Remedial teaching for learning disabled children among fifth grade students. Two null hypotheses were tested. The study adopted the pre-test-post-test-control group design. Simple random sample of sixty four (64) students were drawn from seven schools in Meerut, Uttar Pradesh, India. The researcher developed computer assisted instructional package (Game/Simulations) for Learning Disabled Children which was used as an instrument for experimental group while control group were exposed to traditional teaching method. The instrument for data collection was DTLD Test. The t-test statistics was used to analyse the hypothesis. The findings revealed that experimental group performed better than the control group.

Keywords: Computer assisted instruction, learning disabled, DTLD, remedial teaching

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 and work individually or solve problems in a group. Computers provide immediate feedback, letting students know whether their answer is correct. If the answer is not correct, then the program gives the correct answer to the question. Computers offer a different type of activity and a change of pace from teacher-led or group instruction. *(Access Center (2008) http://www.colorincolorado.org/article/22028/)*

Computer Assisted Instruction (CAI) is a new teaching- learning strategy in which the topics to be taught is carefully planned, written and programmed in a computer which could be run at the same time in several computer units and allows each student a computer terminal. The instructions are also programmed on a computer disc (CD), which could be played using audio, video, drag and drop, gaming and simulation activity for the student to learn the topic at his/her leisure time and at his/her own pace. The potential benefit of Computer Assisted Instruction (CAI) can not be underestimated in the contemporary world. There is a lot of established findings on the instructional value of computer, particularly in advanced countries. There are now several CAI packages on different subjects. It is obvious that current trend in research all over the world is the use of computer facilities and resources to enhance students' learning. Chang (2000) and Yusuf (2009) opined that "many exercises that depart from traditional method are now readily accessible on the web (p.521), even though teachers do not use these facilities'. Jenk and Springer (2005) opined that the way CAI is delivered can affect its effectiveness, and that new studies are needed to clarify the effect of CAI in contemporary student environment. Instructional material and strategies through Computer Assisted Instruction have been found to aid academic achievement and retention. Orisebiyi (2007), who investigated the effect of computer assisted package on student's achievement in learning disability found CAI to be effective on student's achievement. However from reviews, it was observed that many of the studies were focused on some parts of Mathematics such as Algebra, Statistics, word problem and quadratic equation, not much on geometry using CAI Package.

Computer-assisted instruction improves instruction for students with disabilities because students receive immediate feedback and do not continue to practice the wrong skills. Computers capture the students' attention because the programs are interactive and engage the students' spirit of competitiveness to increase their scores. Also, computer-assisted instruction moves at the students' pace and usually does not move ahead until they have mastered the skill. Programs provide differentiated lessons to challenge students who are at risk, average, or gifted.

Learning Disabilities

"Learning disability is a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning or mathematical abilities. These disorders are intrinsic to the individual and presumed to be due to Central Nervous System dysfunction." (*Hammilt et.al.*). Even though learning disability may occur concomitantly with other handicapping conditions (*e.g.,* sensory impairment, mental retardation, social and emotional disturbance) or environmental influences (*e.g.,* cultural differences, insufficient/inappropriate instruction, psychogenic factors) it is not the direct result of these conditions or influences.

Student with learning disabilities (LD) have been described in essence as those children and adolescents with at least average potential to learn, but for whom academic achievement in the core areas of learning including reading, mathematics, and writing fall far short of their potential (Hallahan and Kauffman, 2007; Hallahan, Lloyd, Kauffman, Marteniz, and Weiss, 2005). There is growing evidence that the

academic difficulties experienced by students with LD are in fact cumulative in nature such that the gap between achievement and potential grows from childhood to adolescence (Miller, Fitzgerald, Koury, Mitchem, and Hollingsead, 2007). On the other hand, there is evidence that children with LD fall behind their peers without LD in the level of their cognitive development. The Difference between both parties reaches half a stage or about a sub-stage. At the time the children without learning disabilities reach the sub-stage of intuitive thought of the operational stage according to Piaget, their peers with LD are in the pre-conceptual thought (Mohammed, 2006). This gap should be borne in mind when dealing with those children or trying to educate them.

The purpose of this study was to investigate the effectiveness of computer-assisted instruction developed by researcher for use with primary school pupils, particularly fifth graders, for improving their learning disabilities. Follow up was gathered to determine the maintenance of CAI.

Statement of the Problem

Persons with learning disability are average or above average intelligence and have no visual or hearing impairment but have specific learning problems in reading/writing/spelling/speaking/arithmetic, due to a disorder in psychological processes like memory, attention and / or perception etc. Learning disabled children, despite being slow, possess, the ability and motivation to perform the task accurately but are hampered by high cognitive load which require sallow and sustained effort. It appears that the reason is not their intellectual deficiency but cumulative inferiority feelings and self-devaluation resulting from continuous academic failure and parental/peer rejection. The world of the affluent and privileged hardly looks into the problems of these learning disabled children, although they constitute the largest proportion in the special-need population.

The Program of Action (POA), National Policy on Education (NPE), 1986, recommended that the centrally sponsored scheme of integrated Education for Disabled children (IEDC) should be reviewed in the light of the NPE and revised to facilitate speedy expansion of educational facilities for the disabled children in common with the other children in general schools.

Keeping in view all the above considerations the researcher decided to undertake a study of remediation of learning disabilities through computer Assisted Instruction (Game/Simulations) as compared to traditional method of teaching.

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Objectives of the Study

The objectives of this study are to:

1. develop and validate a computer assisted instruction package for remediation of learning disabilities.

2. compare the relative effectiveness of remediation of learning disabilities with computer assisted instruction and traditional method.

Hypotheses of the Study

As the present study is exploratory in nature, a number of hypotheses have been formulated for testing in the present situation:

1. There is no significant difference between the mean score pre-test experimental group and post-test experimental group of students taught with effectiveness of CAI method of teaching in remediation of learning disability.

2. There is no significant difference between the mean score of students taught with effectiveness of computer assisted instruction and traditional method of teaching in remediation.

Scope of the Study

The study focused on the effectiveness of computer assisted instruction as remedial teaching for learning disabled fifth grade students. It was limited to fifth grade students of CBSE board in Meerut city, Uttar Pradesh State. The DTLD topics taught during the study comprises of introduction to geometry, quadrilateral and their properties, polygons and areas of plane and solid shapes.

Methodology

The research design for this study was pre-test-post-test experimental group and pre-test-post-test control group design. The target population were seven hundred and forty-nine (749) from seven (07) CBSE schools in Meerut, Utter Pradesh, India. The sample for this study was made up of 64 students using simple random sampling techniques (Behavioural Checklist, NVGIT, DTLD). A breakdown revealed that the experimental group consisted of 32 students with a gender balance of boys (n=17) and girls (n=15), while the control group had a gender balance of boys (n=17) and girls (n=15) respectively. The experimental group was taught using computer assisted instructional package (games/simulations) which covered ten factors of learning disability, while control group was taught using traditional method.

Research Instruments

The instruments for this study are Behavioural check list and Diagnostic test of learning disability (DTLD) (Swarup and Mehta) adapted, Non-verbal group intelligence test (Imtisnugba AO [Kohima]) adapted, and Computer Assisted Instruction (CAI) package developed by researcher.

Method of Data Collection

The teachers in the sampled schools were trained as research assistants in the use of computer assisted instruction package. The study period was of 45 classes twice a week. The classes were conducted in a

computer lab with computer assisted instruction package. There was an orientation between the researcher and the students who underwent the test from the selected schools. The experimental group students were exposed to computer assisted instruction package which had been installed on desktop computer, while control group students were taught using traditional teaching method having the same content used for the experimental group. At the end of the experimental study, DTLD was administered as the post-test to measure the outcome of learning disability of the students. The DTLD test was administered in the same manner for the post-test also. The test was conducted at the same time with the help of research assistants in each school and the script collected immediately for scoring. The 't'-test was used to test all the null hypotheses using Statistical Package for Social Sciences (SPSS) version 20 at 0.05 alpha level.

Results

Hypothesis 1: There was no significant difference between the mean score of students taught with effectiveness of computer assisted instruction of pre-test and post-test teaching in remediation of learning disability for learning-disabled.

Table 1. t-test comparison of pre-test and post-test of experimental group scores

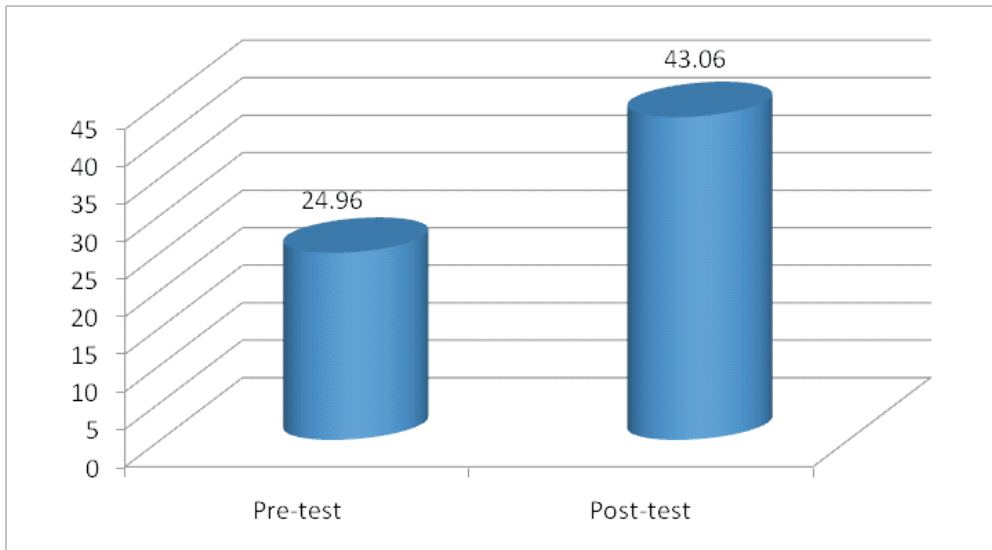| Testing	N	M	S.D.	'r'	't'
Pre-test	32	24.96	2.83	0.63	37.84**
Post-test	32	43.06	3.19		

* Significant at .05 level

Figure 1: Comparison of pre-test and post-test of experimental group mean scores

Table and Fig 1 indicate that t-test comparison of the pre-test and post-test of experimental group with mean scores. The mean score for pre-test was 24.96 and that of the post-test was 43.06. The calculated t-value 37.84 with less than 0.01 alpha level. This indicates that there is statistically significant difference between the mean score of the pre-test experimental group scores (24.96) and post-test experimental group scores (43.065) (p<0.01). From this we can conclude, that computer assisted $_{instruction}$ (Games/Simulations) methods are highly effective in remediation of learning disability among fifth graders. Furthermore, the product-movement correlation between the pre-test and post-test scores on DTLD was also found to be highly positive (0.63).

Hypothesis 2: There is no significant difference between the mean score of students taught with effectiveness of computer assisted instruction and traditional method of teaching in remediation of learning disability.

Table 2: t-test comparison of control and experimental group on post-test scores

Groups	N	M	S.D.	df	't'
Control Group	32	31.62	2.97	31	14.83**
Experimental Group	32	43.06	3.19		

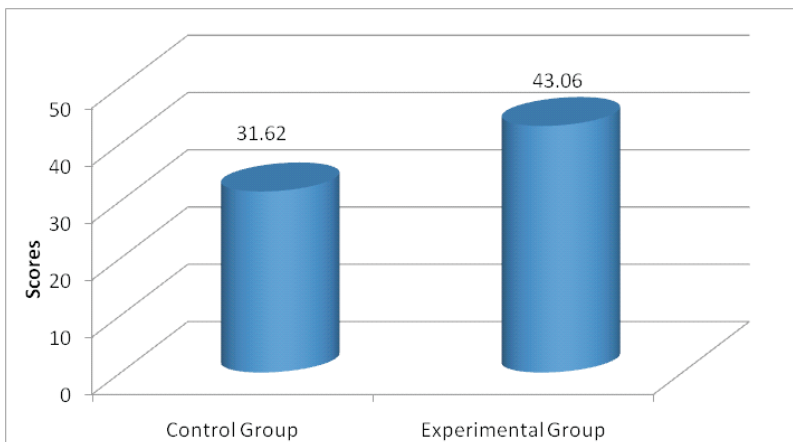* Significant at the .05 level

Figure 2: Comparison of control and experimental group on post-test mean scores

Table and Figure 2 indicate that t-test comparison of the post-test mean scores of experimental and control groups. The mean score for experiment group was 43.06 and that of the control group was 31.62. The calculated t-value was 14.83 with less than 0.01 alpha level. This indicates that there is statistically significant difference between the mean score of the experimental group (43.06) and the

control group (31.62) (p<0.01). The experimental group exposed to computer assisted instruction performed significantly better than the control group who were taught using traditional method. From this we can infer that computer assisted instruction (game/simulations) method was better than the traditional method in remediation of learning disability for students of fifth grade.

Summary of the Findings

The summary of findings for this study are:

1. There was significant difference between the mean score of fifth grade students taught with computer assisted instruction between the pre-test and post-test of experimental group

2. There was significant difference between the mean score of fifth grade students taught with computer assisted instruction and those taught with traditional method of teaching.

Discussion of the Results

Table and Figure 1 shows the comparison in the mean scores of the pre-test and post-tests of experimental group. There was significant difference between the pre-test and post-test of experimental group of mean scores of student taught with computer assisted instruction. The result is in agreement with the findings of Sharma (2004); Scheid (2010); Mohammed and Kanpolat (2010); confirmed that CAI proved to be effective in remediation for learning disability of students.

Table and Figure 2 shows the comparison of post-test mean scores of experimental and control groups. There was significant difference between the mean scores of students taught with CAI and those taught with traditional method of teaching in remediation of learning disability. The result is in agreement with the findings of Safo *et.al.* (2013), Basturk (2005); Robinson (2005); Akour (2006); Orisebiyi (2007); Yusuf (2010) who found and reported significant difference in the performance of students taught with CAI. Contrary to the above finding, this result was in contrast to the previous findings of *Bayraktar* (2008); *Etukudo* (2002) among others who did not find any significant difference between the students exposed to CAI and those exposed to traditional method.

Conclusion

It was concluded that computer assisted instruction as remedial teaching for learning disability enhanced the fifth graders of Meerut, Uttar Pradesh State.

Recommendations

On the basis of findings from this study, it is recommended that:

There should be continuous training in computer to ensure awareness and literacy through a series of symposia, seminars, conferences to instil computer literacy among learning disabled students. Teachers

and students especially of fifth grade should be made to learn how to write simple computer programs, in order to aid fast integration of skills in developing computer assisted instruction by teachers.

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