

EFFECTS OF COMPUTER ASSISTED INSTRUCTION ON PUPILS' ACHIEVEMENT IN SPELLING IN ENGLISH LANGUAGE IN NIGER STATE

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Abstract

The study investigated effects of computer assisted drill and practice instruction on pupils' achievement in English Language spelling in Niger State. The study adopted quasi-experimental design. Purposive sampling was used to select four schools from 2,603 schools in the seven educational zones of Niger State. One hundred and twenty pupils were drawn as study sample from a population of 135,245 primary two pupils'. The study sample comprised of 62 males and 58 females. One intact class each was randomly assigned to the four schools under study. Control group was taught with lecture method while experimental group was taught with CAI Drill and Practice package. Two research questions and two hypotheses guided the study. English Language Achievement Test (ELAT) was used for data collection. The CAI package and ELAT were face validated by experts while the reliability was established using Kuder Richardson (KR 20) analysis and the reliability coefficient was found to be $r = 0.74$. Treatment lasted for four weeks. Mean and standard deviation were used to analyze the research questions while analysis of covariance (ANCOVA) was used for testing the hypotheses. Findings showed that CAI drill and practice package enhanced achievement of English language spelling. It is recommended that curriculum planners should infuse CAI packages into English programmes so that primary school teachers' can use it to teach English language concepts.

Introduction

English language is the most widely used language in the world. English is very crucial as a medium for teaching and learning of all school subjects in the Nigeria educational system and is a pre-requisite for admission into nearly all programmes in the universities. The role English language plays in the world of communication and scientific advancement cannot be over emphasized. The government of Nigeria considers English language as a core subject in the school curriculum and a major medium of communication both within and outside the school system. The national policy on education, Federal Republic of Nigeria (FRN, 2004) demands ability to communicate effectively at the primary school level. It was stated in the policy that the medium of instruction at primary school shall be the language of the environment for the first three years and from the fourth year English language shall be taught as a subject and used progressively as a medium of instruction.

The achievement of pupils' in English language at all levels of education especially at the primary school level is poor (Okoro, 2002). Pupils' terminal examination result in (2012-2013) and First School Leaving Certificate Examination (2013-2015) in English language organized by Chanchaga Local Government Education Authority in Minna, Niger State showed that pupils' performed poorly in the subject. Okoro (2002) stated that the problem of poor level of achievement of primary school children is a serious issue in Nigeria. Furthermore, Kolawole (2002) also confirmed the poor achievement of primary school pupils in English language. The author explained that the poor achievement was due to a number of reasons such as: the use of tribal language in the lower classes of primary school, some pupils do not understand the grammar because their teachers themselves do not know it and in most cases English language teachers in the senior primary schools resort to the use of mother tongue to explain English language even up to secondary school level.

More importantly, apart from these factors listed above, Adama (2009) stated that non-availability of teaching materials is one of the factors which contribute to poor achievement by pupils' in English language examinations. The author also noted that only ten percent of pupils' who go to primary school are successful in the National Common Entrance Examination. Other factors that have been identified as

responsible for the poor achievement in English language include non-utilization of audio-visual instructional materials, poor English language teaching and expression, poor knowledge of the subject by the teacher, inadequate relevant English language textbooks and use of cell phones or handsets for text messages which have negative impact on pupils' learning because of short cut in spelling of words among others. Hence, the poor achievement of pupils' in the subject may be related to pupils' inability to retain what has been taught in class since the mode of communication outside the school is their local language. The researcher observed that in our present day schools, most teachers' do not carry on dictation in their teaching of English language and this affects students' knowledge of spelling.

National Teachers Institute Kaduna (2006) in its' Manual for Retraining of Primary School Teachers stated that spelling involves associating some letters with certain sounds or words. Spelling can also be defined as an act of forming words correctly using letters of alphabets. Spelling is a serious problem among learners particularly in primary and secondary school level; this problem is largely due to the fact that dictation which was a very vital tool in word-formation or learning of words in English language is no longer carried on as a routine in classroom teaching and learning.

Lecture method of teaching is the most widely used method employed by teachers in our institutions of learning. In this method of teaching, students are encouraged to sit quietly, listen and perhaps take down notes. Adeoye (2002) describes lecture method as one which involves the lecturer talking according to pre-planned, structured scheme while the students listen and make notes. Adeoye (2002) explained that it might not be easy to write off lecture method stressing that this method of teaching is not ideal for immature learners especially primary school pupils. It makes learners considerably passive and does not cater for individual differences in learners.

The National Primary School Curriculum Module (2006) stated that to use conventional method of teaching and learning of spelling in primary two through dictation, the teacher writes down sentences or new-words on the chalkboard from the pupils' copybook or any approved course book, teacher and pupils' go through the words carefully, teacher wipes off the words or sentences from the chalkboard while pupils' carry out the oral and written spelling test given by the teacher.

Another method of teaching spelling is to spell or combine letters to form words for names of simple familiar objects, write such simple words for names of such objects. Pupils listen to the teacher pronounce such words and repeat the words after the teacher. The pupils' activities that will lead to achievement of lesson objectives are: Pupils listen to the teacher spell and pronounce each word. Pupils repeat the spellings and pronounce after the teacher, pupils write down the words as the teacher dictates them. The exercise could also be oral or written test given by the teacher.

With the advent and introduction of ICT into the field of education it became necessary to shift from lecture method of teaching to use of ICT interactive learning devices such as computer which makes learner to be actively involved in the learning process unlike lecture method of teaching which makes learners passive and had contributed to learners' poor achievement in English language. Computer Assisted Instruction (CAI) is a relatively new educational innovation in primary school classrooms in Nigeria and Niger State in particular. Nigeria as a developing nation requires solid foundation in its educational system especially at the primary school level if it must compete favorably with other nations of the world (Aniah, 2015).

CAI package according to Ash (2005) is an interactive instructional technique whereby a computer is used to present the instructional material and monitor the learning that takes place. Umaru (2003) defined Computer Assisted Instructional package as a program of instruction presented as computer software for instructional purposes. In line with this, Basturk (2005) referred to CAI as the use of the computer as a tool to facilitate and improve instruction. The following are types of Computer Assisted instruction: drill and practice, tutorial, games, simulation, discovering and problem solving.

Drilling mean listening to a model provided by a teacher or a tape or another student and repeating what is heard. Drills are a form of very controlled practice. In drill exercises, there is one correct answer and the main focus is on 'getting it right' that is on accuracy. Drills are usually conducted chorally (i.e. the whole class repeats) then individually. There is also the possibility of groups or pairs of students doing language drills together. Its' main purpose is to help learners master materials at their own pace. Drills are used as reinforcement tool and are mainly used for beginners or for students who are experiencing learning

problems. Onyejekwe (2006) described drill as the condition in which a learner is encouraged to practice a skill over and over again until he masters such skill. Drill and practice software packages provide feedback to students, explain how to get correct answer and contain a management system to keep track of student progress. Onyejekwe (2006) further stated that drill and practice is probably the most common and best known educational application of the computer. Such repetitive actions are employed in the learning of mathematics, reading, spelling, and other basic skill areas. Drill and practice exercises with the appropriate software can enhance the daily classroom experience (Julie, 2015).

The procedure for using CAI (drill and practice) package instructional delivery in teaching letters A-J, demand that only one letter at a time is treated. For instance, if a child gets an option or answer correct after teaching letter "A" the teacher proceed to the next letter but if the child gets the option wrong, revisit the same letter until the child gets it right. This procedure is applicable to letters A-J used in this study. The study also determines the influence of pupils' gender on their achievement when taught using computer assisted instruction.

The concept of gender is used to describe those characteristics of men and women that are societal determined, in contrast to those which are scientifically determined which affect the use of computer in teaching and learning of science concepts (Victoria, 2005). Gender difference is one of the factors affecting learning and many researchers such as Gambari, (2004) and Dantala, (2005) have focused their attention on studies relating to its effect on pupils' academic achievement. Studies on the influence of gender on achievement have not produced conclusive results. Some findings indicated that significant differences existed between the achievement of male and female students while other findings showed that gender factor had no influence on students' achievement (Yusuf, 2004). The author noted that gender has no impact on students' academic achievement. This evidence in academic achievement due to gender had resulted in the need to verify the influence of computer assisted instructional packages on pupils' achievement in English language spelling. However, from the studies made so far on the use of CAI packages, no research has been carried out on the effects of CAI packages on achievement and gender on pupils' English language spelling in Niger State.

Statement of the Problem

The achievement of pupils' in English language has not been encouraging despite its' importance to national development. The researcher observed that pupils have serious problems with English language spelling because of mother tongue interference; pupils' use of cell phones or handsets for text messages which has negative impact on their learning because of short cut in spelling of words. Pupils' poor achievement has been attributed to poor teaching methods employed by teachers' and the non-utilization of instructional materials, poor knowledge of the subject and expression by teachers and inadequate relevant English language textbooks that contain spelling activities. Furthermore, some pupils cannot pronounce English language words correctly. This has contributed to pupils' poor achievement in English language at the primary and secondary school levels. For instance, pupils' Terminal Examination Result 2012/2013 and First School Leaving Certificate Examination 2005-2007 organized by Chanchaga Local Government Education, Minna indicated poor achievement. This poor achievement calls for urgent action to reverse the situation from primary school which is the foundation for other levels of education. Thus, to enhance the teaching of spelling, the pupils must first know their alphabets and should be able to listen to people very well and also be able to inculcate in them the skills involved in listening. It was against this background that the researcher used CAI drill and practice package as media of instruction to find out its' effects on pupils' achievement in English language spelling in Niger State.

Purpose of the Study

The main purpose of this study was to find out the effects of Computer Aided Instruction (CAI) on pupils' achievement on spelling in English Language in Niger State. Specifically, the study was designed to determine the:

1. effect of CAI drill and practice package on the mean achievement scores of pupils' taught English Language Spelling of words using alphabet A-J.
2. effect of CAI package on the mean achievement scores of male and female pupils' taught English Language Spelling of words using alphabet A-J.

Research Questions

1. What are the mean achievement scores of pupils taught English language spelling of words using alphabet A-J with CAI package and those taught with lecture method?
2. What are the mean achievement scores of male and female pupils taught English language spelling of words with CAI package using alphabet A-J?

Hypotheses:

The following null hypotheses were formulated and tested in the study.

HO₁: There is no significant difference in the mean achievement scores of pupils taught English language spelling of words using alphabet A-J with CAI package and those taught using lecture method.

HO₂: There is no significant difference in the mean achievement scores of male and female pupils taught English language spelling of words using alphabet A-J with CAI package.

Methodology

This is the procedures used to collect and analyze data for the study. These are presented under the following sub-headings: Design of the study, area of the study, population of the study, sample and sampling techniques, instrument for data collection, validation of the instruments, reliability of the instruments, procedures for data collection and data analysis.

Design of the Study

This study adopted the quasi- experimental design. Specifically, the quasi-experimental design is the non-equivalent control group design. This is because intact classes (i.e pre-existing groups) were used, since randomization was not possible.

The design layout:

Group	Pretest	Treatment	Posttest
Experimental	01	X	02
Control	01		02

Where:

01 refer to pre-test performance,

02 refer to posttest performance, and

X refers to treatment for Group 1 (Experimental - CAI Condition)

Area of the Study

The study was carried out in Niger State due to the fact that the state is one of the states the researcher identified that primary school pupils have poor achievement in English language and the government has made little or no effort to address the situation. Niger State comprises of 25 Local Government Areas grouped into seven educational zones. These zones include Bida, Kutigi, Minna, Suleja, Kontagora, Rijau and New-Bussa.

Population of the Study

The population of the study comprises all the primary two pupils in public schools in the seven educational zones in Niger State. The number of public primary schools in the seven education zones is 2,603. The population of primary 2 pupils in these schools is 135,245.

Sample and Sampling Techniques

In composing the sample for the study, the researcher adopted multi-stage sampling techniques. Multi-stage sampling is carried out in this order starting with purposive sampling of schools for the study, followed by random sampling of classes from the selected schools to be used for the study and lastly, the stratified sample for the study. Purposive sampling technique was used to draw four government's owned public primary schools from three Educational Zones in Niger State comprising of Zone A, B and C respectively. 120 pupils were drawn as sample from the seven Educational Zones made up of 25 Local Government Areas in Niger state. The study sample consists of 62 males and 58 females.

Instrument for Data Collection

The instrument that was used in collecting data for this study is the researcher designed English Language Achievement Test on Spelling (ELAT). The English Language Achievement Test covered spellings using ten English language alphabets A-J. The chosen concept was selected from primary two pupils English language syllabus and it corresponds to what the pupils should be taught in their school at the time of study. Each item of the instrument was based on spellings from English language alphabets or letters. The ELAT contains two major sections. Section "A" deals with demographic data of the pupils such as name of school, class, age and sex. Section "B" of the ELAT consists of three parts. Each part has major test items with sub-items under each part. Part "one" has one question on "letter identification" and contains 10 items with 10 marks allocated to it. Part "two" has two questions on "spelling and oral speech test, question one has 10 items and carries 10 marks while question two has 12 items and carries 10 marks. The test was designed in line with Bloom's taxonomy to measure the six levels of cognitive domains of learners.

Validation of Research Instrument

In order to obtain a standardized test on English language achievement test (ELAT) and computer assisted drill and practice package developed by the researcher were subjected to experts validation.

The English language test items on (spelling) were subjected to face and content validity by four experts, two from school of General Studies, Federal University of Technology, Minna and the other two from the Department of English language, Niger State College of Education, Minna. The experts were specifically requested to examine the instrument using the following guidelines:

1. clarity of spellings.
2. appropriateness of words formed at the pupils level of understanding, experience and
3. agreement of words formed with those articulated in the developed CAI drill and practice package.

Furthermore, the experts critically examined all the spellings using alphabets A-J. They were to ascertain the relevance of the words formed to the content and extent to which the content covered the topics they are meant to cover. The test items and contents of the package were later modified on the basis of suggestions and recommendation of experts. Furthermore, the content of validation was carried out using table of specification.

In the process of validation of ELAT the developed instructional package was also given to four experts for validation, two of them were from Science Education Department, Federal University of Technology Minna, Niger State and two from Department of Arts Education, University of Nigeria, Nsukka (UNN). They were requested to validate the package in terms of the appropriateness of the package for the chosen topics, clarity and simplicity as well as its suitability for the level of primary two pupils and possible errors in the structuring of the package. The experts comment and suggestions were used to correct some mistakes while their suggestions and recommendations were used to improve on the package.

Reliability of Instrument

For the purpose of determining the reliability of the instrument, the test on English language spelling was administered to 30 primary two pupils' who constitute part of the population but were not used in the main study. The trial testing helped the researcher to determine the appropriate timing of the test as well as identify any problem which may affect the administration of the instrument during the study. The scores of the 30 pupils' were subjected to estimate of temporal stability using test-retest method with two weeks interval. The two set of scores obtained were subjected to Kuder Richardson (KR 20) correlation analysis. A correlation coefficient of $r = 0.74$ was obtained from the analysis. This value therefore revealed that the instrument is reliable for English Language Achievement Test (ELAT).

Experimental Procedures

The researcher visited the selected schools to seek for the official permission and cooperation to use the schools and facilities from the respective school authorities. Each of the four purposively sampled schools were assigned to experimental and control group using simple random sampling technique. The cooperation of the pupils and staff in all selected schools were sought; they were informed about the objective of the study. The subject teachers were trained as research assistants in the use of computer assisted instructional package. The experimental group teachers received specific training designed to equip them with necessary strategies for implementing the treatments. The control group teachers were given

instruction to co-ordinate the pupils for conventional lecture method. This training and demonstration sessions on the procedure for carrying out the experiment cover four days. The training was done in the selected schools according to instructional strategies assigned to each school.

Before the commencement of the experiment, English spelling Achievement Test (ELAT) was administered to the experimental and control groups as pretest. The idea behind administering the pretest is to ascertain the academic equivalence of the pupils in English before the commencement of the experiment. English language teachers in the schools selected were used to administer the pretest. Also trained research assistants were employed to assist the teachers in administering the pretest in each of the selected schools at the appropriate time for each of this test.

Lecture method was used by the class teacher to present lessons for the control group. The content of the instruction was the same as in all the groups used for the study.

Method of Data Collection

The instrument that was used for data collection in this study was English Language Achievement Test (ELAT). Prior to the commencement of the experiment (ELAT) was administered on all the primary 2 pupils as pretest in the participating schools. Similarly at the expiration of the experimental period (four weeks) the post-test on English language Achievement test (ELAT) was administered on the experimental and control groups with the aid of English language research assistants. The scores obtained from the experimental and control groups were used to determine the academic achievement of both groups. The scores of the experimental and control group on the posttest were computed, recorded and used for data analyses.

The instrument (ELAT) was administered to the experimental and control group as pre-test. To reduce the retest effects, the questions were reframed and administered as post-test. On the scoring of the test items, marks were awarded for correct responses based on marks assigned to each section and zero for incorrect answer.

Results

H_{01} : There is no significant difference in the Mean Achievement Scores of Pupils taught English Language Spelling using alphabet A-J with CAI drill and practice package and those taught using lecture method.

Table 1:
Summary of ANCOVA for Achievement Scores of Pupils taught English Language Spelling using CAI Drill and Practice Package and Lecture Method.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Decision
Corrected Model	7472.259	2	3736.130	122.23	.000	
Intercept	4797.902	1	4797.902	156.96	.000	
Pretest	108.926	1	108.926	3.564	.062	
Method	7126.195	1	7126.195	233.11	.000	S
Error	3575.607	117	30.561			
Total	269032.000	120				
Corrected Total	11047.867	119				

Significant ($p < 0.05$)

Table 1 shows that $F(1, 117) = 233.11, p = 0.000$. Since the value 0.000 is less than 0.05 level of significance. Hence, null hypothesis 1 was rejected. Therefore, there was significant difference in the mean achievement scores of pupils taught English Language Spelling with CAI Drill and Practice and lecture method. This shows that CAI Drill and Practice improve pupils' achievement in English Language Spelling.

HO₂: There is no significant difference in the Mean Achievement Scores of Male and Female Pupils taught English Language Spelling using alphabet A-J with CAI drill and practice package.

Table 2:
Summary of ANCOVA for Achievement Scores of Male and Female Pupils taught English Language Spelling using alphabet A-J with CAI Drill and Practice Package.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Decision
Corrected Model	3.294	2	1.647	.031	.969	
Intercept	3721.299	1	3721.299	70.954	.000	
Pretest	.436	1	.436	.008	.928	
Gender	1.997	1	1.997	.038	.846	NS
Error	2989.439	57	52.446			
Total	182956.000	60				
Corrected Total	2992.733	59				

Not Significant ($p > 0.05$)

Table 2 shows that $F(1, 57) = .038, .846$. Since $.846$ is greater than 0.05 level of significance, the null hypothesis is upheld. Therefore, there is no significant difference in the mean achievement scores of male and female pupils taught English language spelling with CAI drill and practice. This shows that CAI drill and practice is not gender biased in teaching English language spelling using alphabet A-J.

Summary of findings

The major findings of this work are summarized based on the results of the analysis of data presented in this chapter.

1. CAI Drill and practice package enhanced pupils' achievement in English language spelling than when taught using lecture method.
2. There was no significant difference in the mean achievement scores of male and female pupils' taught English language spelling using CAI drill and practice package.

Discussion of Findings

The results showed that the post-test mean achievement score of pupils taught with CAI drill and practice package (Experimental Group) is higher than the post-test mean achievement score of pupils taught with lecture method (Control Group). This is further confirmed by the result which revealed that the achievement of experimental and control groups differ significantly. The result indicated that treatment using CAI package produced significant difference on pupils' achievement in English language spelling. Abdullah, Jebreen, Aieman, and Sadeq (2009) findings on effect of CAI language learning in teaching grammar support the present study which showed that the instructional method (CAI drill and Practice) was in favour of the experimental group. This result is also in line with Yusuf and Afolabi (2010) study, Tabassum (2004) who found out that the achievement of students exposed to CAI was better than that of their counterparts exposed to conventional lecture method.

The results of the posttest mean achievement of male and female pupils' taught English language spelling using CAI drill and practice package. The mean achievement scores of the male pupils taught with CAI drill and practice package is slightly higher than that of the female students taught with the same CAI package. This is further confirmed by the result which indicated that treatment using CAI package produced no significant difference on gender. This result agrees with Chado, (2009) who stated that computer is gender friendly. Ezekoka (2010) study on use of computer in teaching and learning oral English language revealed no significant effect on gender achievement.

Conclusion

The following conclusions were made based on the findings of this study. The result of this study provides empirical evidence that the use of CAI drill and practice package enhanced pupils' achievement in English language spelling more than the use of lecture method.

Secondly, pupils' taught English language spelling with the use of CAI package (experimental group) performed better than their counterpart taught the same English Language spelling using lecture method. There was no significant difference in gender achievement of pupils taught English Language spelling with CAI drill and practice package. This implies that gender has no significant effect on achievement of pupils' in English language spelling using CAI drill and practice package. Therefore, the use of CAI drill and practice package enhanced the teaching and learning of English language spelling.

Recommendations

This study recommended among other things that teachers should adopt the use of CAI packages in teaching since the use of CAI drill and practice in teaching English language spelling was found to be more effective than the lecture method. It was also found to be a facilitative instructional strategy for improving pupils' achievement in English language spelling.

Based on the above fact on CAI, it has become imperative for Nigeria and indeed Niger State to integrate and use CAI in teaching English language spelling in primary schools to enhance students' achievement.

Workshops and seminars should be organized on periodic basis to educate English language teachers on the use of CAI packages in teaching English language spelling and other concepts in English language.

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