

EFFECTS OF COMPUTER ASSISTED INSTRUCTION - DRILL AND PRACTICE ON PUPILS' ACHIEVEMENT AND RETENTION IN SPELLING AND WORD-FORMATION IN ENGLISH LANGUAGE IN NIGER STATE, NIGERIA

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Abstract

The study investigated effects of Computer Assisted Drill and Practice Instruction on Pupils Achievement and Retention in English Language Spelling and Word-formation 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 in Niger State. 120 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. Six research questions and six 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 in the testing of the hypotheses. Findings show that CAI drill and practice package enhanced achievement and retention of English spelling and word-formation. 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.

KEYWORDS: English Language, Spelling, Word-formation, Computer Assisted Instruction, Drill and Practice, Achievement, Retention

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 prerequisite 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. The policy demands 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 objective of this study was to find out the effects of computer assisted CAI drill and practice instruction on Pupils' Achievement and Retention on Spelling and Word-formation in English Language using alphabets A-J in Niger State.

The achievement of pupils' in English language at all levels of education especially at the primary school level is poor (Okoro, 2002). 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 that 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.

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.

Retention is the ability to reproduce the learnt concept when the need arises (Damiral, 2004). Retention involves the ability to recall the content that has been given within a specific period of time. It is the ability to demonstrate what the learner has learnt and being able to demonstrate his/her cognitive skills in the subject (Wushishi, Danjuma, and Usman, 2013). However, pupils' ability to reproduce the learnt material could be through the use of appropriate instructional methods like innovative teaching strategies in teaching. Learning could be made more effective, lasting and enjoyable and topics that are abstract to students could be made clearer, easier and meaningful for better achievement of concept learnt. Unfortunately, in our present day schools, most teachers' do not carry on diction in their teaching of English language and this affects students' knowledge of spelling.

National Teachers Institute Manual for Retraining of Primary School Teachers (2006) 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 has been relegated to the background. Wise (1992) defined word-formation as an aspect of language learning which prepares an individual for language use during the primary school years. In other words, it is an act of acquiring new words to equip oneself for effective communication orally or in written form. Word-formation is very important in a child's learning because it increases pupils' acquisition of new words and also enhances flexibility in their expression and communication both within and outside the school. Pupils' ability to form words using various learning activities thereby expanding the

breadth and depth of vocabulary knowledge e.g. the use of cross-word puzzles is very important in any learning process.

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.

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 computer assisted instruction especially at the primary school level if it must compete favorably with other nations of the world (Aniah, 2015).

Computer Aided Instruction (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. In this study, the CAI that was used is drill and practice because it allows for student interaction with computer and enhances repetition of concept learnt.

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' i.e 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) 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 CAI drill and practice on gender achievement using letters A-J.

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 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 and word-formation. 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, retention and gender on pupils' English language spelling and word-formation 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. 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 and retention in spelling and word-formation in Niger State.

Research Questions

- 1 What are the mean achievement scores of pupils taught English Language Spelling of words with CAI drill and practice package and lecture method using alphabet A-J?
- 2 What are the mean achievement scores of pupils taught English language word-formation with CAI drill and practice package and lecture method using alphabet A-J?
- 3 What are the mean retention scores of pupils taught English language spelling of words with CAI drill and practice package and lecture method using alphabet A-J?
- 4 What are the mean retention scores of pupils taught English language word-formation with CAI drill and practice package and lecture method using alphabet A-J?

- 5 What are the mean achievement scores of male and female pupils taught English language spelling of words with CAI drill and practice package and lecture method using alphabet A-J?
- 6 What are the mean achievement scores of male and female pupils taught English language word-formation with CAI drill and practice package and lecture method using alphabets A-J?

Hypotheses

The following null hypotheses were formulated and tested at 0.05 Alpha Level of significance.

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

HO₂: There is no significant difference in the mean achievement scores of pupils taught English language word-formation with CAI drill and practice package and lecture method using alphabet A-J.

HO₃: There is no significant difference in the mean retention scores of pupils taught English language spelling of words with CAI drill and practice package and lecture method using alphabet A-J.

HO₄: There is no significant difference in the mean retention scores of pupils taught English language word-formation with CAI drill and practice package and lecture method using alphabet A-J.

HO₅: There is no significant difference in the mean achievement scores of male and female pupils taught English language spelling of words with CAI drill and practice package and lecture method using alphabet A-J.

HO₆: There is no significant difference in the mean achievement scores of male and female pupils taught English language word-formations with CAI drill and practice and lecture method using alphabet A-J.

Methodology

This is the procedures used to collect and analyze data for 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

01	X	02	03
01		02	03

01 refer to pre-test performance,
 02 refer to posttest performance,
 03 refer to retention-test performance, and
 X refers to treatment for Group 1 (Experimental - CAI Condition)

The study was carried out in Niger State due to the fact that the state is one of the states the primary school pupils have been identified with the problem of poor achievement in English language. Niger State comprises of 25 Local Government Areas grouped into seven educational zones.

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. Source: Niger State Universal Basic Education Board (2014).

The researcher adopted multistage sampling techniques. 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. Purposive sampling technique was used to draw four government owned public primary schools from three Educational Zones in Niger State comprising of (Zone A, B and C).

The instrument that was used in collecting data for this study is the researcher made English language Achievement Test (ELAT). The English Language Achievement Test covered spelling and word-formation using ten English language alphabets A-J. The chosen concepts were 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 spelling and word-formation using English language alphabets or letters.

The English language test items on (spelling and word-formation) 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 critically examined all the spellings and words-formed 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.

The developed instructional package was also validated by four experts; 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 test on English language spelling and word-formation was administered to 30 primary two pupils' who constitute part of the population but were not used in the main 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.

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) on spelling and word-formation 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 and retention of both groups. The scores of the experimental and control group on the posttest were computed, recorded and use for data analyses. After two weeks of administration of post-test on the experimental and control group it was followed with the administration of retention test

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

HO₁: There is no significant difference in the Mean Achievement Scores of Pupils taught English Language Spelling with CAI Drill and Practice and Lecture Method.

Table 1: Summary of ANCOVA for Achievement Scores of Pupils taught English Language Spelling using CAI Drill and Practice 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	156.926	.000	
Pretest Method	108.926	1	108.926	3.564	.062	
	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 value (233.11) has a probability value of .000. Since this value 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.

HO₂: There is no significant difference in the Mean Achievement Scores of Pupils taught English Language Word Formation with CAI Drill and Practice and Lecture Method.

Table 2: Summary of ANCOVA for Achievement Scores of Pupils taught English Language Word Formation using CAI Drill and Practice and Lecture Method.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Decision
Corrected Model	2585.185	2	1292.593	29.985	.000	
Intercept	10853.210	1	10853.20	251.769	.000	
Pretest Method	45.985	1	45.985	1.067	.304	
	2224.356	1	2224.356	51.600	.000	S
Error	5043.615	117	43.108			
Total	118528.000	120				
Corrected Total	7628.800	119				

Significant ($p < 0.05$)

Table 2: shows that there is significant difference in the mean achievement scores of pupils taught English Language Word-Formation with CAI Drill and Practice and lecture method since the **F value (51.600)** is significant at **.000** which is less than 0.05.

HO₃: There is no significant difference in the Mean Retention Scores of Pupils taught English Language Spelling with CAI Drill and Practice and Lecture Method.

Table 3: Summary of ANCOVA for Retention Scores of Pupils taught English Language Spelling with CAI Drill and Practice and Lecture Method.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Decision
Corrected Model	7702.345	2	3851.172	163.190	.000	
Intercept	3171.316	1	3171.316	134.382	.000	
Posttest	22.345	1	22.345	.947	.333	
Method	2185.605	1	2185.605	92.613	.000	S
Error	2761.122	117	23.599			
Total	274792.000	120				
Corrected Total	10463.467	119				

Significant (p < 0.05)

Table 3 shows that there is a significant difference in the mean retention scores of pupils taught English Language spelling with CAI Drill and Practice and lecture method since the F value (**92.613**) is significant at **.000** which is less than 0.05.

HO₄: There is no significant difference in the Mean Retention Scores of Pupils taught English Language Word-Formation with CAI Drill and Practice and Lecture Method

Table 4: Summary of ANCOVA for Retention Scores of Pupils taught English Language Word-Formation using CAI Drill and Practice and Lecture Method.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Decision
Corrected Model	1482.659	2	741.329	30.174	.000	
Intercept	2885.586	1	2885.586	117.450	.000	
Posttest	378.526	1	378.526	15.407	.000	
Method	253.331	1	253.331	10.311	.002	S
Error	2874.541	117	24.569			
Total	124944.000	120				

Corrected Total	4357.200	119
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Significant ($p < 0.05$)

Table 4 shows that there is significant difference in the mean retention scores of pupils taught English Language word formation with CAI Drill and Practice and lecture method since the **F value (10.311)** is significant at **.002** which is less than 0.05.

HO₅: There is no significant difference in the Mean Achievement Scores of Male and Female Pupils taught English Language Spelling with alphabet A-J with CAI Drill and Practice.

Table 5: Summary of ANCOVA for Achievement Scores of Male and Female Pupils taught English Language Spelling using alphabet A-J with CAI Drill and Practice.

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 5 shows that F value (**.038**) has a probability value of **.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.

HO₆: There is no significant difference in the Mean Achievement Scores of Male and Female Pupils taught English Language Word Formation with CAI Drill and Practice.

Table 6: Summary of ANCOVA for Achievement Scores of Male and Female Pupils taught English Language Word Formation with CAI Drill and Practice.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Decision
Corrected Model	2.652	2	1.326	.174	.840	
Intercept	5035.137	1	5035.137	662.291	.000	
Pretest	1.580	1	1.580	.208	.650	
Gender	1.225	1	1.225	.161	.690	NS
Error	433.348	57	7.603			
Total	73936.000	60				
Corrected Total	436.000	59				

Not Significant ($p > 0.05$)

Table 6 shows that F value (.161) has a probability value of .690. Since .690 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 Word Formation with CAI drill and practice.

This shows that CAI drill and practice is not gender biased in teaching English language word formation.

Discussion of Findings

The findings of this study showed that the use of CAI enhances pupils' achievement and retention of spelling and word-formation in English language. 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 that of Tabassum (2004) who found out that

the achievement of students exposed to CAI was better than that of their counter parts exposed to lecture method. This result agrees with Mishra (2007) who reported that children exposed to computer have positive attitude towards learning than those not exposed to the same treatment. The study carried out by (Alongkorn, Wiphasith, Nipon and Tongluan, 2014) on use of CAI drill and practice on hearing impaired pupils agree with Mishra (2007) that the use of CAI enhanced learner's achievement stressing that their satisfaction level was good.

The result of this work agrees with Nwoji (2002) who stated that students' retention could be attained through the use of CAI packages as medium of instruction in the teaching and learning of spelling and word-formation because it makes learning more meaningful and enjoyable. Kara (2008) work is in agreement with the findings of Nwoji (2002). Kara (2008) investigated the effect of CAI package on physics students' retention in the area of (force and pressure) the experimental group that was taught with CAI had higher retention level than control group that was taught with conventional lecture method. In line with the above finding, Gultekin (2011) research on retention on grade 6th pupils' on the subject of (colour), the experimental group was taught with CAI package while the control group was taught with conventional lecture method. Result shows that experimental group retained higher than the control group. The study has relationship with the present study which investigated the effects of CAI drill and practice on pupils' achievement and retention in English language spelling and word-formation in Niger State.

On male and female use of CAI in teaching of spelling and word-formation, the 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. This result is in support of Chado (2009) whose findings show that computer is gender friendly. This shows that CAI drill and practice is not gender biased in teaching English language spelling and word formation using alphabet A-J. This result also agrees with Noabi (2003) research study on students' using computer assisted instruction in tertiary institutions. The result revealed that there was no significant difference between the mean achievement of males and females in favour of the female students while (Abdullah, Jebreen, Aieman and Sadeq, 2009) in their use of CAI for teaching English grammar revealed that there was significant

difference in achievement in favour of male students. This result is in disagreement with the findings of Noabi (2003) whose study shows that there was no significant difference in the mean achievement of male and female students. This suggests why gender in academic had remained an issue of discussion and inconclusive among scholars.

Conclusion

The result of this study provides empirical evidence that the use of CAI drill and practice package enhanced pupils' achievement and retention in English language spelling and word-formation more than the use of lecture method. Pupils' taught English language spelling and word-formation with the use of CAI package (experimental group) performed better than their counterpart (control group) taught the same concepts using lecture method. There was no significant difference in gender achievement and retention of pupils taught English Language spelling and word-formation with CAI drill and practice package. Primary school pupils' should be trained on the use of computer so as to be computer literate and also fit in, in this present society of technological advancement. Finally, other researchers will use these findings as reference point for other studies.

Recommendations

The following recommendations were made based on the findings of this study.

1. Since the use of CAI drill and practice enhanced achievement and retention of pupils' in English language spelling and word-formation, the English language primary school teachers should use it as one of the technique to be employed in classroom teaching and learning.
2. Based on the above fact, it has become imperative for Nigeria and indeed Niger State to integrate and use CAI in teaching English language spelling and word-formation in primary schools to enhance students' achievement and retention.

References

- Aniah, A. (2015). Effects of computer assisted instruction on pupils' achievement and retention in spelling and word-formation in English language in Niger State, Nigeria. Unpublished Ph.d thesis, University of Nigeria, Nsukka.
- Abdullah, A. N, Jebreen, H., Aieman, A. and Sadeq, S. (2009). The effect of computer assisted language learning in teaching English grammar on achievement of students in Jordan. *The International Arab Journal of Information technology*, 6(4), 431-439.
- Adamu, S. H.& Bello, A. S. (2002). Computer education in Nigerian schools: Problems and Prospects. *Nigerian Journal of Computer Literacy*, 3(1), 96- 102.
- Adeoye, L.S . (2002). *Teaching methods, strategies and techniques*. Ibadan: Kraft Books.
- Ash, J. E. (2005). *The effectiveness of computer-assisted instruction on middle school mathematics achievement*. Retrieved from <http://www.Research Enstae.edu/dissertation/AA 13187984>.
- Alongkorn, A., Wiphasith, N., Nipon, P. and Tonglan, S. (2004). Developing a computer assisted instruction with drill and practice for English teaching to primary school grade six students with hearing impaired. *Journal of the Computer, the Internet and Management*, Vol. 22, 47-53.
- Basturk, R. (2005). The effectiveness of computer assisted instruction in teaching introductory statistics. *Educational Technology and Society*, 8 (2), 170-178.
- Chado, M. I. (2009). *Development and use of a computer- assisted instruction package for teaching metal forging technology at Nigerian Certificate of Education (Technical) Level*. Unpublished Ph.D Thesis Bauchi: Abukar Tafawa Barewa University.
- Mishra, R. C. (2007). *Teaching of information technology*. New Delhi: APH Publishing Corporation.
- Naobi, A. F. (2003). Enhancing students' performance in using computer assisted instruction (CAI) in tertiary institution. In Akale, Mag (Ed). Proceedings of the 44th Annual Conference of Science teachers Association of Nigeria (STAN).
- Damiral, O. (2004). *Planning and evaluation in instruction*. Art of Teaching Pegem Publication.

- Ezekoka, G. K. (2010). Effect of gender on use of computer in teaching and learning process. Proceedings from 31st Annual Convention and National Conference of Nigeria Association of Educational Media and Technology (NAEMT) held at Niger State College Education, Minna 20th -26th September.
- Federal Republic of Nigeria, (2009). *National Policy on Education*. Lagos: Federal Government Press.
- FGN/UNICEF, (1992). Workshop guide for the production and effective utilization of teaching and learning materials for primary school teachers.
- Federal Ministry of Education, (2004). *National Policy on Education – 4th edition*. NERDC Press Lagos:
- Gultekin, A. (2011). Compariing traditional and computer assisted instruction in teaching of colour to 6th grade pupils' and determination of its' retention. Département of Applied Arts, Arts and Design Faculty, Gazi University, Ankara, Turkey. e-mail: gultekinakengina@gmail.com. Tel: + 90053241628 46.
- Kolawole, C. O. O. & Dele, A. (2002). An examination of national language policy Nigeria and its' implications for teaching and learning of English language. *Ibadan Journal of Education Studies*, 2(1): 12-20.
- Kara, I. (2008). The effect on retention of computer assisted instruction in science education. *Journal of Instructional Psychology*, 35(4), 357-364.
- Mishra, R. C. (2007). *Teaching of information technology*. New Delhi: APH Publishing Corporation.
- Naobi, A. F. (2003). Enhancing students' performance in using computer assisted instruction (CAI) in tertiary institution. In Akale, Mag (Ed). Proceedings of the 44th Annual Conference of Science teachers Association of Nigeria (STAN).
- NTI, (2006). Manual for re-training of English language primary school teachers. National teachers' Institute, Kaduna.
- Niger State Universal Basic Education Board, (2014). Information management unit. Statistics of Primary School Pupils Enrollment.
- Nwoji, Q. J. (2002). Production and utilization of teaching materials. Nsukka: Fulladu publishers.

- Okoro, D. C. U. (2002). Basic education- emerging issues, challenges and constraints in the state of education in Nigeria. A Publication of UNESCO Nigeria Abuja Office. 34-51.
- Onyejekwe, A. (2006). Information communication technology: A giant stride for the Achievement of Functional Education in Nigerian Schools in the 21ST Century. Proceedings of the 31st Annual Convention and National Conference on ICTs in Nigerian School systems, Nigeria Association for Educational Media and Technology held on 20th-26th, September (2010) College of Education Minna, Niger State. 30 - 34.
- Tabassum (2004). The effects of the computer- based instructions on the achievement and problem solving skills of the science and technology students. *The Turkish online Journal of Educational Technology*, 10, (1) 183-185.
- Victoria, N. N. (2005). Relative effectiveness of computers, video-tape and audio instructional media on the learning of secondary school science in Abuja Municipal council. Unpublished M.Tech thesis, Federal University of Technology Minna, Niger State, 63-64.
- Wise, B. (1992). Whole learning comparisons on a computer system. *Journal of Experimental Child Psychology*, 54, 147-167.
- Wushishi, D. I., Danjuma, K. I., and Usman, H. (2013). Effect of concept mapping modes on sec school students retention level in mathematics in Niger State, Nigeria. *Journal of Research and Method in Education, (IOSE- JRME)* 2 (5) 55-58.
- Yusuf, A. (2004). *Effects of cooperative and competitive instructional strategies on junior secondary school students' performance in social studies, in Ilorin, Nigeria*. Unpublished Ph.D Thesis, Curriculum Studies and Educational Technology, University of Ilorin, Nigeria.