EFFECTS OF COMPUTER MEDIATED POWER POINT PRESENTATIONS ON SECONDARY STUDENTS' LEARNING OUTCOMES IN BASIC SCIENCE IN OYO STATE, NIGERIA

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Abstract

This study determined the impact of computer mediated power point presentations on students' achievement in and attitude to Basic science in Oyo State, Nigeria. A pre-test, posttest, control group quazi-experimental design was adopted for the study. Two hundred and five (205; M= 83, F=122) junior secondary two students selected using stratified random sampling technique participated in the study. Three research questions and three hypotheses guided the study. Two instruments – Students' Basic Science Attitudes Scale (SBSAS, r = 0.91); Students' Knowledge of Basic Science Test (SKBST, r = 0.82) were used for data collection. Descriptive statistics of mean, standard deviation and inferential statistics of ANCOVA, scheffe post-hoc test were used to analyse the data. The results indicated significant main effect of treatment on students cognitive ($F_{(1,200)}$= 171.680; p<0.05; η^2 =.239) and attitudinal ($F_{(1,200)}$= 34.466; p<0.05; η^2 =.086) achievement in Basic science with the experimental group having higher mean gain than the control group. Gender has significant main effect ($F_{(1,200)}$= 23.382; p<0.05; η^2 =.0816) on students cognitive outcomes but not significant for attitudinal achievement in Basic science. The study therefore recommended among others that computer mediated power point presentations should be incorporated into curriculum methodology of Basic science in secondary schools.

Keywords: Basic Science, Computer mediated Power Point Presentations, Gender, Students' Achievement

Introduction

Basic science under Universal Basic Education (UBE) requires the availability of qualified Science teachers with requisite teaching method to succeed. Quality science teaching methods are undoubtedly the pillars on which the scientific and technological development of any nation depends. Iwuozor (2000) in Ogbu (2012) observed that science is an area of learning which enhances a nation's development especially in the area of automation by virtue of its numerous values to humanity. Apart from the government's efforts, other agencies like the Science Teacher's Association of Nigeria (STAN), Comparative Education and Study Adaptive Centre (CESAC), United Nations Educational, Scientific and Cultural Organization (UNESCO) and others are not left out in the race of promoting science based education in Nigeria. All branches of science have important contributions to make in Nigeria's technological advancement. One of such background to solid scientific understanding is Basic science. Basic science combines the topics in fragmented sciences and integrates these in a thematic approach to expose the students and pupils in upper and lower Basic schools to phenomena in Science.

The implementation of Basic Science Programme has been on for a couple of decades at the junior secondary school levels in Nigeria. Research reports (Odubunmi, 1991; Ozoji, 1998; Adejoh, 2006; Adejoh and Sambo, 2012; Olagunju, 2010; Obanya, 2010, Okebukola, 2013;

Babayemi, 2014; Ogundare, 2014) indicate that there are a number of problems that confront its effectiveness at that level. These problems range from dearth of qualified teachers, ineffective teaching methods, inadequate materials resources to poor attitude to implementation work by teachers. This invariably led to poor performance of the students in the subject.

Table 1.0: Basic Science Results 2005 – 2011

Years	Total Students	No with A & C	% with A & C
2005	89,826	45,138	50.25%
2006	112,182	56,316	50.20%
2007	123,894	62,172	50.18%
2008	132,560	61,505	40.40%
2009	96,050	48,250	50.23%
2010	141,291	68,947	48.80%
2011	138,693	61,859	44.60%
Total	834496	404187	48.43%

Source: Oyo State Ministry of Education (2012)

Table 1.0 shows that the students' performance in Basic Science in Junior secondary examination in Oyo State is below average. One of the constraints to effective basic science teaching and learning is poor teaching method.

Poor teaching methods have been predominantly in use for a long time in the teaching of science (Ezeudu, 1995; Okebukola, 2007, 2013; Okpala, 2011; Babayemi, 2014) which is traditionally based and expository in nature. Such methods as demonstration, guided inquiry, discovery method could be result oriented but they have been reported to have made students fail to see the inter-dependent relationship that exist between academic contents of science subjects offered in schools and their real life applications (Njoku, 2009 in Ogbu, 2012). Consequently, Nzewi (2011), Ogar and Upula (2013) propose the need for a search for better instructional methods for the attainment of improved learning outcome. Notable among such innovative approaches is the computer mediated power point presentations.

Rationally, this is a clarion call for the supports of the teacher in the teaching – learning process. The clarion call is in hegemony with the Constructivists and Behaviourists Instructional theories. To the constructivists, the human learning is constructed, that learners build knowledge upon the foundation of a prior or previous knowledge. The view of teaching – learning process paradigm shift from the passive transmission of information from one individual (teacher) to another (learner) into a participatory situation in which no stereotype of status as teacher and learners; everybody becomes active.

The constructivists like Glaserfeld, Vygotsky, Gagne, Piaget, Bruner, and many others believe that instructors or teachers or lecturers act as facilitator and not as teachers (Patel, 2013). Where a teacher gives a didactic lecture that covers the subject matter, a facilitator helps the learners to get to his or her own understanding of the content. Learners play an active role in learning process. Brownstein (2001) affirmed a dramatic role a facilitator needs to display which are totally different from that of a teacher or lecturer. A teacher tells, a facilitator asks; some teacher lecturers from the front, a facilitator supports from the back; a teacher gives answers according to a set of curriculum, a facilitator provides guidelines and

creates the environment for the learner to arrive at his or her own conclusions, a teacher mostly gives a monologue, a facilitator is a continuous dialogue with the learners.

This follows the psychological theory of "reinforcement" and "behavioral modification" as presented by Thorndike (1931) and Skinner (1954) among others also bears relevance to use of computer in teacher education. Naturally, when didactic lecture method is used to instruct the learners, they are unconditionally unresponsive, unstirred and passive to learning but whenever computer is utilized, the message structure into the brain stimulated and conditioned the attitudes to learning and the achievement of the instructional objectives (Patel, 2013; Abimbade, 2006, 2011; Mangat and Mangal, 2009; Chaung and Slavin, 2011; Erhan and Okan,2011; Afolabi, 2006; Oduwaye, 2009). Nigeria as a developing nation needs her youths – the future generation to be prepared and equipped for the 21st century challenges. This calls for the need to integrate ICT into her educational system since education is concerned with the acquisition of knowledge, skills and attitudes (Ojo, 2008).

Incorporating media technology into the classroom has become a global trend and in recent years, schools and institution of higher learning in Nigeria and the world-over are integrating multi-media into their educational curriculum methodology to enhance the teaching learning process. Such a multi-medium is Computer-mediated power-point presentations (Ogar and Upula, 2013; Anulobi, 2012; Abraham, 2012; Abimbade, 2011; Erdermir, 2011; Susckind, 2007; Blalock and Montgomentry, 2005; Bartsch and Cober, 2003).

PowerPoint is a software tool that has become a presentation staple in lecture halls, conference rooms, and through the application of computer-based training. It is used in over 30 million presentations a day, and its software is on 250 million computers world-wide (Alley & Neeley, 2005; Erdimir, 2011). Initially, PowerPoint was developed to improve learning by providing the means to develop presentations that are more structured and interesting to audiences (Amare, 2006). Researchers have examined the benefit that these types of presentations bring to various audiences. Overall, research indicates that students prefer PowerPoint-type Presentations (PPPs) to traditional lectures (Susskind, 2005; Gok & Sılay, 2008; Anulobi, 2012; Abraham, 2012; Ogar & Upula, 2013).

Some lecturers state that PowerPoint inhibits the presenter-audience interaction (Driessnack, 2005), limits the amount of detail that can be presented (Tufte, 2003), and reduces a presentation's analytical quality (Stein, 2006). On the other hand, supporters claim that PowerPoint improves learning, invokes audience interest and aids explanations of complex illustrations (Apperson, Laws, & Scepansky, 2006). In short, all software has advantages and disadvantages, and this debate highlights the fact that PowerPoint is no exception.

Numerous studies have been conducted to determine whether or not PPPs affect the students' success in science instruction. Studies have revealed that the reason for success in science education have been associated with students' motivation, interest, and the use of PPPs in the classroom setting (e.g. Craker, 2006; Normah & Salleh, 2006). Furthermore, studies have consistently indicated that students generally bselieved that the use of PowerPoint facilitated their learning and retention (Apperson, Laws, & Scepansky, 2008; Mantei, 2000; Rankin & Hoaas, 2001; Szaba & Hastings, 2000). Therefore, the use of the PPPs to increase student teachers' achievements should be considered as an important step in science education.

Students who were exposed to teaching methods with PPPs emphasized that the interest and achievements were improved and said that PPPs enhanced learning and success (Frey &

Birnbaum, 2002; Apperson, Laws, & Scepansky, 2008) because they were able to see the notes (e.g., slides and texts) on the screen and easily follow the subject. Moreover, research has indicated that the sole use of traditional teaching methods has negative effects on students learning or comprehension of science concepts (Araujo, Veit, & Moreira, 2004; Susskind, 2005). So, it can be concluded that we need to implement contemporary teaching methods, tools, and technology (e.g., PPPs and computerized teaching) into science education in order to increase the level of students' academic success.

Educators hypothesize that the use of PPPs in science courses aims to encourage students' active involvement in science teaching and learning (Blas & Fernández, 2009; Gay, 2009). It enables students to learn, interpret the information, and retain the knowledge for a long time. Further, it attracts the students' attention to the subject, makes the lesson easy to learn, and helps to memorize abstract and concrete information (Erdemir, 2009; Savoy, Proctor & Salvendy, 2009; Wofford, 2009). Students appreciate the details, distinctive features, and critical points in the figures on the slides when graphic presentations are used. Hand-drawn figures cannot be copied onto the board. The impact on the success of this type of drawing is not as great as PPPs within the classroom setting (Bartsch & Cobern, 2003; Yucel, 2007).

In fact, students perceive lectures accompanied by computer-mediated PowerPoint presentations as more organized (Susskind, 2005) and better at emphasizing key points (Frey & Birnbaum, 2002; Susskind, 2005; Szabo & Hastings, 2000) than traditional lectures. When college instructors accompany lectures with computer-mediated PowerPoint presentations, there are positive effects on students' attitudes toward the course and self-efficacy beliefs (Frey & Birnbaum, 2002; Kask, 2000; Susskind, 2005; Szabo & Hastings, 2000).

Students claimed that PowerPoint presentations made it easier to attend to and understand the lectures. Students felt they took better notes and believed their notes were more organized, easier to understand, and useful for studying for exams when PowerPoint was employed (Szabo & Hastings, 2000; Frey & Birnbaum, 2002; Frey & Birnbaum, 2002; Susskind, 2005; Apperson, Laws, & Scepansky, 2006).

The purpose of education is to produce wholesome, pleasant and understanding individual who will interact wisely and purposefully within and outside the environment. Studies have demonstrated that students prefer power point and respond favourably to classes when it is used.

Anulobi (2012) experimented the effectiveness of power point slides and chalkboard instructional delivery methods on academic performance of Junior Secondary School Fine arts students in Owerri, Nigeria. A quazi-experimental design was adopted for the study. The subjects were randomly placed in control and experimental groups. Two research instruments were used to collect data from the subjects, t-test and ANOVA statistical tools were used to analyse the data. The results revealed that the students taught with power point slides (experimental group) performed better than those taught without power point slides (conventional group).

Abraham (2012) examined learners' perception about power point presentations in English Classroom, fifty arts and humanities male learners were exposed to power point slides presentation in one semester of their course of study. The data collected and analysed revealed that learners preferred power point presentation over traditional lecture methods and had positive attitudes towards PPPs and lectures who use them in their lessons.

Erdemir (2011) determined the effect of power point on students' achievement in Physics over the traditional lectures, using pretest-posttest control group quazi – experimental research design and 90 science student-teachers (Pre–service teachers) in physics education in a University in Turkey. T–test was used to analyse the data collected. The results indicated that PPPs group had higher grades than the control group and that intelligent use of power point presentations in Physics instruction is capable of increasing the students' success.

Susskind (2007) determined the limits and effects of power point's power: Enhancing students' self – efficacy and attitude but not their behaviour. Quazi – experimental design was adopted with two groups composed of 42 students in experimental group and 38 students in the control group. Descriptive statistical of mean and standard deviation were used to describe the results as well as a non – parametric statistics of ANOVA to determine any significant difference in the two groups. The results showed that power point presentations have significant influence on students' self – efficacy, attitude and academic achievement in University than the traditional method.

Nouri and Shahid (2005) conducted an experiment on the effect of power point presentations on students learning and attitudes using control-treatment design on seventy-four Accounting students, the regression analysis and Analysis of Covariance showed that power point presentation improved students' attitudes as well as short-term memory of the students.

Blalock and Montgomery (2005) determined the effect of PowerPoint on student performance in principles of economics in an exploratory study, twenty-four students were selected for chalk classroom and thirty-three students in the class receiving the multimedia presentation. The subjects were measured on four exams with 185 questions. Descriptive statistics of mean and standard deviation and Z-score was used to standardized the performance on the exams. The results indicated that power point presentations can improve test scores significantly and that students who are above-average academic performer students receive more benefits from multimedia presentations than students of below-average academic performance.

Bartsch and Cobern (2003) investigated effectiveness of power point presentations in lectures over overhead transparencies. Quazi – experimental design was adopted for the study with thirty – nine students in social psychology class at the University of Texas and Analysis of variance as a method of data analysis, the result showed that students preferred power point presentations to over head transparencies and traditional method of lecture.

Also, evidence in the related literatures (Ogbu, 2012; Egbo, 2005; Okebukola, 2007, 2013) shows that some factors have been shown to either singly or in combination with instructional methods influence students' academic outcome in sciences, among them is the student's gender. Therefore, this present study was carried out to determine the relative efficacy of computer mediated power point presentations and its interaction effect with gender on upper Basic Two students' outcome in Basic Science in Oyo East Local Government Area of Oyo State, Nigeria.

Purpose of the Study

The main purpose of this study is to determine the relative efficacy of computer mediated power point presentations on students' academic and attitudinal achievement in Basic Science in Oyo East Local Government Area of Oyo state, Nigeria.

The study equally examined the influence of the innovative strategy on the students' cognitive and affective outcomes based on gender.

Statement of the Problem

Baseline data revealed that students have low level of achievement in Basic Science in Oyo State, Nigeria. This poor achievement in Basic Science might engender negative attitude to the subject, delimit the rate of use of scientific concepts and ideas in their respective field of study which invariably produces low scientific and technological manpower and a resultant effect on dwindling social and economic development in the state and the nation at large. Studies have indicated the effectiveness of Computer-mediated Power Points Presentations (CMPPPs) on students learning. Therefore, this study determined the effects of CMPPPs on students' achievement and attitude to Basic Science in Oyo State, Nigeria.

Research Questions

The following research question's guided the study:

(i) What is the cognitive mean score of Junior Secondary Two students in Basic Science when taught with computer mediated power point presentation and students taught conventional method?

(ii) What is the cognitive mean score of male and female students in Basic Science when taught with computer mediated power point presentations?

(iii) What is the attitudinal difference in senior secondary two students when taught with computer mediated power point presentations and students taught with conventional method?

Hypotheses

Ho_1: There is no significant main effect of computer mediated power point presentations on students:
   a. Cognitive outcome;
   b. Attitudinal outcome in Basic Science.

Ho_2: There is no significant main effect of gender on students:
   a. Cognitive outcome;
   b. Attitudinal outcome in Basic Science.

Ho_3: There is no significant interaction effect of computer mediated power point presentations and gender on students:
   a. Cognitive outcome;
   b. Attitudinal outcome in Basic Science.

Methodology

Research Design: A pre-test-post-test control group quazi experimental design was adopted for the study.

Population and Sample: The population for this study is the junior secondary school two students in Oyo East Local Government Area of Oyo State, Nigeria. Four schools were selected for the study using stratified random sampling method. Two of the selected schools were randomly assigned to the experimental group while the other two were assigned to the control for replication. A total of 205 students constituted the sample size.

Research Instrumentation: Two evaluative research instruments and two instructional guides were used for the study.

The two evaluative instruments are:

(i) Students' Basic Science Attitudes Scale (SBSAS);

(ii) Students' Knowledge of Basic Science Test (SKBST).

The two instructional guides are:
(a) Computer Mediated PowerPoint Presentations Guide (CMPPPsG);
(b) Conventional Teaching Method Guide (CTMG).

SBSAS is a 20 items instrument adapted from Zubair and Nasir (2011) Attitudes towards Science Learning (ATSL) Scale. With sections A and B. The instruments were validated for face, content and construct validity by experts in guidance and counseling. SKBST was a 20 item multiple choice instrument with 5 options, one correct option (stem) and four plausible distracters for each item. The research tool was constructed based on selected topics using table of specification. Thirty items were initially generated from Junior Class Two Basic Science Curriculum, consisting of work, energy, power, renewable and non-renewable resources and machines, given to experts in Basic Science and Science Education for contents and face validity.

SASAS was subjected to Cronbach's Alpha measure for reliability and a value of 0.91 showed the tool to be valid and reliable. SKBST was subjected to Kuder-Richardson formula 20 (KR-20) to determine the internal consistency, reliability values of 0.82 was gotten for the instrument.

Procedure for Data Collection

The treatment comprised of the two instrumentation strategies (computer mediated PowerPoint presentations and conventional teaching method). The Basic Science teachers in the respective schools of study were trained for a week on how to administer the treatment. The treatment process lasted eight weeks. The two response research instruments – SBSAS and SKBST were administered as pretests before the treatments commence and immediately after the treatment, the instruments were administered again on the same students as posttest.

Method of Data Analysis: The data obtained was analysed using mean, standard deviation and Analysis of Covariance (ANCOVA).

Results

Table 2.0: Summary of Students Achievement with Treatments and Gender

Students Learning Outcome	N	Treatments		Gender	
		CMPPPs	CTM	Male	Female
		101	104	83	122
Cognitive	Pretest				
	X	8.02	9.89	9.25	8.43
	SD	2.37	2.18	3.71	3.99
	Posttest				
	X	16.31	14.72	14.83	16.29
	SD	4.52	7.36	5.76	3.11
	Mean Gain	8.29	4.83	5.58	7.86
Attitude	Pretest				
	X	53.61	55.09	51.86	56.73
	SD	8.22	10.32	11.27	9.56
	Posttest				
	X	62.12	60.91	59.22	63.81
	SD	7.25	5.68	8.04	6.62
	Mean Gain	8.51	5.82	7.36	7.08

From table 1, the students' cognitive achievement in Basic Science mean gain for computer mediated power point presentation (CMPPPs) is 8.29 while that of the Conventional Teaching Method (CTM) is 4.83. Also, female students have a mean gain of 7.86 which was higher than mean gain of 5.58 of male students.

On attitude, the mean gain of 8.51 for CMPPPs is higher than the mean gain of 5.82 for CTM. The mean gain of 7.08 for female students was less than the mean gain of 7.36 for male students.

Table 3.0: Summary of 2 x 2 Analysis of Covariance (ANCOVA) of Students Basic Science Cognitive Achievement by Treatment and Gender

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Covariates (Pretest)	381.522	1	381.522	65.095	0.000*
Main Effects (combined)	1295.337	2	647.669	110.505	0.001*
Treatment	1006.216	1	1006.216	171.680	0.011*
Gender	137.042	1	137.042	23.382	0.002*
2-way Interaction	8.929	2	4.465	0.762	0.649
Treatment * Gender	8.929	2	4.465	0.762	0.649
Model	715.266	4	143.053	24.408	0.001
Residual	1172.201	200	5.861		
Total	1887.467	204	8.779		

*significant @ p<0.05

From table 3.0, there is a significant effect of treatment on students Basic Science cognitive achievement ($F_{(1,200)}$= 171.680; p<0.05*;* η^2 =.239). this means that the student agricultural science cognitive achievement is significantly different across the treatment. based on this result, Ho1 (a) was rejected. Also, from table 3.0, there is significant main effect of gender on students cognitive achievement in agricultural science ($F_{(1,200)}$= 23.382; p<0.05*;* η^2 =.0816), therefore, Ho2 (a) was not accepted. However, there is no significant interaction effect of treatment and gender on students' cognitive achievement in Basic Science. This means that the students' response to the treatment was not influenced by their sex whether male or female. Therefore, the Ho3 (a) was accepted.

Table 4.0: Summary of 2x2 Analysis of Covariance (ANCOVA) of students Basic Science Attitudinal Achievement by Treatment and Gender

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Covariates (Pretest)	929.113	1	929.113	15.892	0.000*
Main Effects (combined)	5722.692	2	2861.346	48.942	0.001*
Treatment	2015.005	1	2015.005	34.466	0.000*
Gender	13.879	1	13.879	0.237	0.071
2-way Interaction	19.052	2	9.526	0.163	0.119
Treatment * Gender	19.052	2	9.526	0.163	0.119
Model	13071.725	4	2614.345	44.717	0.001
Residual	11692.833	200	58.464		
Total	24764.558	204	120.803		

*significant @ p<0.05

From table 4.0, there was a significant effect of treatment on students Basic Science attitudinal achievement ($F_{(1,200)}$= 34.466; p<0.05*;* η^2 =.086), therefore, Ho_1 (b) was rejected. Also, from table 4.0, there is no significant attitudinal difference in Basic Science

based on gender ($F_{(1,200)}$= 0.237; p>0.05; η^2 =.001). Therefore, Ho_2 (b) was accepted. Likewise, there was no significant interaction effect of treatment and gender on students attitudinal outcome in Basic Science ($F_{(1,200)}$= 0.163; p>0.05 ; η^2 =.003). Therefore, Ho_3 (b) was accepted.

Discussion

From the research question answered and the tested hypotheses in the results, it was realized that the computer mediated power point presentations (CMPPPs) have a significant effect on the cognitive outcome of the junior secondary two students in Basic Science. The observed significant effect of the treatment on the cognitive outcome of the participants could be explained on the facilitative effects of CMPPPs on the participants. This finding is in corroboration of the earlier findings of Ogar and Upula (2013); Anulobi (2012); Abraham (2012); Erdermir (2011) Erhan and Okan (2011); Susskind (2007); Nour and Shahid (2005); Blalock and Montgomery (2005); Batsch and cobem (2003) that computer mediated power point presentations has the strength of raising learners' cognitive outcome than the conventional teaching methods.

The innovative teaching strategy (CMPPPs) was also significant in raising the students' attitudinal outcome than the conventional strategy. This observed significant effect of treatment on the participants' attitudinal outcome could be explained on the traits associated with PPPs that is self-stimulating, interest arousing, instructional delivery enhancement, enrichment, enablement and empowerment of teaching and learning. These findings find supports in Abraham (2012); Susskind (2007); Bartsch and cobem (2003) that reported positive significant influence of power point presentations on students' attitudes.

Furthermore, the results of this study indicated a significant main effect of students' gender on their cognitive outcomes in Basic science but not on their attitudinal outcome. The female students out-performed their male counterparts in academic achievement in Basic Science. This is a positive trend in the right direction as women takes their rightful position in national development. This result is supported by Babayemi (2014), Ogundare (2014), Okebukola (2013), Ogbu (2012), Egbo (2005) that female students, at present, are achieving better than the male students in science.

Conclusion

The following conclusions were reached from the results of the study:

(i) Innovative strategies like computer mediated power point presentations can enhance students' cognitive and attitudinal outcomes in Basic science.

(ii) Students' gender can make or mar students' cognitive outcomes in Basic Science and not their attitudinal outcomes.

Recommendations

On the basis of the findings of this study, the following recommendations were made:

(i) The secondary school Basic science curriculum should be reviewed with a view to integrate computer mediated power point presentations as one of the plausible teaching methodology.

(ii) Secondary school teachers and students should be motivated by using computer mediated power point presentations to facilitate teaching-learning process.

(iiii) The Nigerian Government at National, State and Local level should collaborate to provide computer and other necessary gadgets as well as subject softwares to facilitate the use of computer mediated power point presentation in schools.

(iv) Need for professional development of secondary school teachers in the country to be computer literate and twenty-first century compliance.

(v) There is urgent need for Public Private Partnership (PPP) in sourcing and accessing electronic instructional materials like computer and other gadgets to ensure the procurement of appropriate equipment for schools at reasonable cost.

References

Abimbade, A. (2011). ICT in the Classroom: Implications for E-learning. *32nd Proceedings of Nigeria Association for Educational Media and Technology (NAEMT)* pp. 6 – 8.

Abraham, O. (2012). Teaching English as a global language in smart classrooms with PowerPoint presentation. *English Language Teaching*, 5(12), 54 – 60.

Afolabi, A. O. (2006). *Effects of computer assisted instructional package on secondary school students' performance in Biology, in Oyo, Nigeria.* A. PhD Thesis, University of Ilorin.

Aina, S. A. (2006). *Students cognitive and affective factors as determinants of achievement in senior secondary physics in Oyo and Ogun States.* An Unpublished Ph.D Thesis, University of Ibadan, Ibadan.

Ajeyalemi, D. (2011). Practical work in school science: are the aims and objectives being achieved memorial lecture STAN. *52nd Annual Proceedings. HEBN PLC*. P. 9. 10.

Anulobi, J. C. (2012). Effectiveness of Powerpoint slides and chalkboard instruction delivery methods on academic performance on junior secondary school fine arts students' in Owerri. *NAEMT International Conference Proceedings,* 1, 20 – 29.

Apperson, J. M., Laws, E. L. & Scepansky, J. A. (2006). The impact of presentation graphics on students' experience in the classroom. *Computers and Education,* 47(1), 116 – 126.

Ariyo, A. O. (2006). *School and students' factors as determinants of students' achievement in physical at the senior secondary school level in Oyo State, Nigeria.* An Unpublished Ph.D Thesis, University of Ibadan, Ibadan.

Blalock, M. G. & Montgometry, R. D. (2005). The effects of power point on students performance in principles of economics: An exploratory study. *Journal for Economics Educators*, 5 (3), 1 – 7.

Erdemir, N. (2011). The effect of PowerPoint and traditional lectures on students' achievement in physics. *Journal of Turkish Science Education*, 8(3).

Erhan, D. & Okan, B. (2011). The relationship between students' exposure to technology and their achievement in science and maths. *Turkish online Journal of Educational Technology*, 10.

Fasasi, R. A. (2012). Improving learners' attitude to science under universal basic education programme: The effect of ethnoscience-baset instruction. *STAN 53rd Annual Conference Proceedings*, Pp. 169-172.

Gyuse, E. Y., Olorukooba, S. B., Lawal, F. K., Lawal, T. E., Olanrewaju, R. R., & Yero, H. (2011). Reform in science education: How science teachers perceive it. *STAN 52nd Annual Conference Proceedings*. p. 75.

Igboegwu, E. N., Egolum, E. O. & Nnoli, J. N. (2011). Knowledge and attitude of chemistry teachers to information and communication technology and the way forward for effective teaching and learning of chemistry in secondary Schools. *Science Teachers Association of Nigeria 52nd Annual Conference Proceedings*. Pp. 261 – 266.

Mangal, S. K. & Mangal, U. (2009). *Essentials of educational technology.* Bahadurgarh: Asoke K. Ghost, PHI Learning Private Ltd. pp 530 – 537.

Nouri, H. & Shahid, A. (2005). The effects of PowerPoint presentations on student learning and attitudes. *Global Perspectives on Accounting Education Education,* 2, 53 – 73.

Oduwaiye, J. O. A. (2009). *Impacts of computer assisted and textual instructions on pre-service teachers' learning outcomes in some environmental education concepts in biology.* An Unpublished PhD Thesis, University of Ibadan, Ibadan.

Ogar, M. N. & Upula, B. E. (2013). Instructional media preference among student-teachers in cross river university of technology, calabar: Imlpications for effective instructional delivery. *NAEMT International Conference Proceedings,* 79-86

Ojo, T. A. (2008). *Impact of video CD and audio cassette-based instructions on secondary school students' learning outcomes in selected environmental education topics in Biology.* An Unpublished Ph.D Thesis, University of Ibadan, Ibadan.

Okebukola, P. A. O. (2007). *Science, technology and mathematics education for sustainable development.* Keynote Address Presented at the Golden Jubilee Anniversary Conference of the Science Teachers Association of Nigeria, Sokoto, August 23, 2007.

Okebukola, P. A. O. (2013). *Saving Nigeria from itself: Towards a redemption plan for education.* A 50th Anniversary Lecture, Faculty of Education, University of Ibadan, Ibadan.

Obanya, P. (2010). *Re-profiling teachers and teacher educators.* A key-note Address Presented at the 1st National Conference of School of Education, Emmanuel Alayande College of Education, Oyo. April 27, 2010.

Patel, D. B. (2013). Construction and effectiveness of computer aided instruction (CAI) programme for the units of science and technology of standard VIII. *International Journal of Research in Education*. 2(1), 112 – 115.

Skinner, B. F. (1954). The science of learning and the art of teaching. *Havard Educational Review*, 24(2), 86 - 97.

Susskind, J. E. (2007). *Limits of PowerPoint's power: Enhancing students' self-efficacy and atttiudes but not their behaviour: Computer and education.* doi:10.1016/j.compedu.2006.12001

Thorndike, E. (1913). *Educational psychology: The psychology of learning*. New York: Teachers College Press.