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Effect of prezzi presentation software on the achievement of students in Computer studies

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ABSTRACT

The study investigated the effect of Prezi presentation software (PPS) on the achievement of students in computer studies. Two research questions and two hypotheses guided the study. The study adopted a quasi-experimental design. The population for the study was 2,259 SS II students in Enugu Education Zone, Enugu State, Nigeria. The sample size was 328 students. The instrument used was Computer Achievement Test. The instrument was validated by three research experts. The reliability estimate for CAT was determined using Kuder-Richardson formula (K-R₂₀). A reliability coefficient of 0.81 was obtained, indicating that the instrument was highly reliable. Mean and standard deviation were used in answering the research questions, while Analysis of Covariance (ANCOVA) was used for testing the hypotheses at 0.05 level of significance. The findings of the study revealed, among others, that students taught computer studies using Prezi presentation software achieved higher than those taught with expository method. Also, male students recorded higher achievement than their female counterparts. Based on the findings of the study, it was recommended that teachers should adopt the use of Prezi presentation software in teaching topics in computer studies to enhance students' achievement. Also, computer studies teachers should be provided with relevant facilities for preparing and teaching their lessons using Prezi presentation software.

1.0 Introduction

The place of technology in classroom activities in most developing countries, including Nigeria, cannot be overemphasized. The emergence of computer technology has changed the global status of education (Cyril, 2015). Today's world, is dominated by the use of Information and Communication Technology

(ICT) (Oyebola, 2018), and is essentially being reduced to a global village. Thus, ICT promotes national development and better relationship with other nations (Adeniyi, 2015).

It has become imperative for teachers, who serve as key implementers of the nation's educational policies, to be well informed and adequately equipped with relevant skills to function productively in this age of information and technological

advancements. This is so because of the great importance of education to national development. It is worthy of note that, whatever the teacher does in the classroom has impact on how well-disposed students are to learning. The method of teaching is, therefore, vital in any teaching-learning situation.

A method of teaching comprises the principles and methods used by teachers to enable a positive student learning outcome (Daluba, 2013). It is determined partly on subject matter to be taught and partly by the nature of the learner. For a particular teaching method to be appropriate and efficient, it has to be in relation with the characteristics of the learner and the type of learning it is supposed to bring about (Daluba, 2013). Research findings of Nwanekezi and Kalu (2012), Oshinaike and Adekunmisi (2012), and Robert (2011) have established that traditional teaching methods have contributed to poor levels of academic achievement in some subjects. This is as a result of improper teaching and learning strategies employed for teaching practical based subjects like computer studies in schools.

Prior to the advent of computer technology into education activities, lecture method, demonstration method, field trip among others have been primarily used in secondary schools in teaching and learning process. According to Ezugwu (2010), the dominant method of teaching and learning of various subjects in secondary schools today is the lecture method. The implication is that, learners are passive and learning tends to be superficial (Durosaro & Adegoke, 2011). Educational researchers have, therefore, continued to carry out researches targeted at finding more effective methods for teaching various subjects under various conditions.

The term computer has been used interchangeably with computer studies and computer education by different researchers. Either way, it means the same thing. Ibanga (2016) asserted that computer is a machine capable of accepting data as an input from the screen, mouse, light pen, scanner, microphone, joystick, manipulates, processed and stored data and brings out the final result as an output through the output devices which include the printer and other devices. Babaduya in Nwanze (2014) defined computer as any electronic device, which under the control of a stored program, can accept data in prescribed form, process the data and supply the result as information in a specific format. Computer, which is a practical based subject, requires an appropriate method of teaching. Hence, for the purpose of this study, Memory Unit which is a topic in computer studies will be comparatively taught with lecture method as well as the use of a presentation software. Memory unit is the place in computer system where data are stored. Computer memory is any physical

device capable of storing information temporarily like RAM (Random Access Memory), or permanently, like ROM (Read-Only Memory). Memory devices utilize integrated circuits and are used by operating systems, software, and hardware (Okoye, 2013). According to Adedeji (2010), if the principles of how students learn are taken into account, richness of the visual content makes instruction more lasting and effective. One possible way to achieve this is through the use of presentation software.

Presentation software, sometimes called "presentation graphics" is a category of application program used to create sequences of words and pictures that tell a story or help support a speech or public presentation of information. There are different types of presentation software, which include PowerPoint, Prezi, Vyond, Zoho show, Google Slides, Keynote, Haiku Deck, Slidedog, Customshow, Emaze and Ludus among others. It has to be noted that PowerPoint is the most common and Prezi is the most innovative presentation software (Graham, 2011). In this study, the researcher is interested in Prezi presentation software because it is the most innovative presentation software among others.

Prezi is a special presentation software that allows users to create special presentations that are ideal for general purposes. Prezi was developed in 2009 to address the perceived limitations of existing presentation tools. Presentations of Prezi are designed on an unlimited two-dimensional space without using a series of slides. The software makes it easy to add graphs, photographs, text and a range of other useful elements to presentations so that the information included in the presentation is clear and easy to understand. In addition, Prezi elements are arranged in a specific order and the incoming information is zoomed in, comes to the forefront and is compared to the other elements on the screen (Graham, 2011).

Considering the fact that Prezi is an emerging learning technology, only a few empirical studies have evaluated the instructional effectiveness of the software. However, the findings of previous studies show positive outcomes for Prezi use in the classroom. For example, Ballentine (2012) instructed students to use Prezi to document their game design and indicated that Prezi might benefit students in game planning. Conboy, Fletcher, Russell and Wilson (2012) interviewed students on their opinions regarding Prezi use. Most of the students reported that Prezi was an effective learning tool for enhancing their learning process. Brock and Brodahl (2013) conducted a cultural comparison between the United States and Norway regarding Prezi application in group projects and determined that Prezi changed the traditional thinking process of students in preparing presentation slides. Although Prezi instruction yields positive outcomes, lacking experimental reports is a major weak-

ness in previous researches. Ozaslan and Maden (2013) concluded in their study that students learned better if the course material was presented through some visual tools like Prezi. These studies were carried out in foreign countries; hence this study intends to find out the situation in Nigerian schools taking cognizance of secondary school students' achievement.

Academic achievement is the level of performance in school subjects as exhibited by an individual. According to Ali (2013), academic achievement is a measure of the degree of success in performing specific tasks in a subject or area of study by students after a learning experience. Academic achievement is commonly measured by examination scores or continuous assessment scores, but there is no general agreement on how it is best tested. Usually, students' class work are quantified on the basis of marks which could either be high or low which means that academic achievement could either be good or bad. Therefore, in this study, the researcher established whether the computer studies achievement will be improved by the use of Prezi presentation software.

One important factor that has been pointed out by researchers is students' gender. Gender is the property that distinguish organism on the basis of their reproductive roles as female or male (Abubakar & Uboh, 2010). Gender is referred to as social and cultural construction and representative of being 'male' and 'female'. Gender, according to Yang (2010), is referred to the social attributes and opportunities associated with being male and female and the relationships between women and men; girls and boys, as well as the relations between women and those between men. But, there is this belief that general imbalance exists in computer usage, access, career and attitude between male and female students (Liao, 2007). Manda and Mulkangara (2007) in Onome (2014) reported that gender is associated with the use of electronic information resources, and that male students were more likely to use e-resources than female students. Based on the importance of technology in teaching and learning process, it is hoped that integrating Prezi presentation software to teaching and learning of computer memory unit will bring about positive effect in students' achievement in computer studies. This constituted the gap this study filled.

1.1 Statement of the Problem

The incessant failure and poor achievement in computer have been attributed to ineffectual lecture teaching method. The lecture teaching method with textbook as the main teaching tool has been the most widely practiced among the computer teachers in Nigeria, especially in Enugu Education Zone of

Enugu State. Not much effort has been made to effect a fundamental change to ensure effective learning among computer students. It seems like the teachers and the students are comfortable with the traditional classroom instruction, while the interest for computer is continually fading away. The WAEC Chief Examiners' reports of 2015, 2017 and 2018 indicated declining achievement of students in Computer examinations. The results revealed that secondary school students' achievement in computer studies in this examination were highly declining, even when few students sat for the examination.

There is need for a paradigm shift of mode of lesson presentations having realized the necessity of applying a more effective teaching methodology. Some innovative teaching methods have been suggested which include Computer Assisted Instruction, Multimedia, Prezi among others. Available evidence shows that not much work has been done on the effect of using Prezi presentation software on academic achievement in computer studies. The problem of this study when posed in question form is, therefore, "What is the effect of Prezi presentation software on the achievement of students in computer studies in secondary schools in Enugu Education Zone of Enugu State"? If effective, would both gender benefit equally?

1.2 Purpose of the Study

The main purpose of the study was to investigate the effect of Prezi presentation software on the achievement of students in computer studies in Enugu Education Zone. Specifically, the study sought to investigate:

the effect of Prezi presentation software on the mean achievement scores and standard deviations of students taught computer memory unit (Experimental group) and those taught using the expository teaching method (Control group) in both pre-test and post-test;

the effect of Prezi presentation software on the mean achievement scores and standard deviations of male and female students taught computer memory unit (Experimental group).

Research Questions

The following research questions guided the study:

What are the mean achievement scores and standard deviations of students taught computer memory unit with Prezi presentation software (Experimental group) and those taught using the lecture teaching method (Control group) in both pre-test and post-test?

What are the mean achievement scores and standard deviations of male and female students taught computer memory unit with Prezi presentation software (Experimental group)?

Table 1: Mean Achievement Scores and Standard Deviations of SS II Students in Experimental and Control Groups in both Pretest and Posttest

Groups	Number	Pre-test		Post-test	
		Mean (\bar{x})	Standard Deviation (s)	Mean (\bar{x})	Standard Deviation (s)
Experimental Group	177	38.44	5.47	73.86	6.11
Control Group	151	36.89	4.11	59.12	5.93
Total	328				

1.3 Hypotheses

The following hypotheses guided the study and they were tested at 0.05 level of significance to further validate the research questions:

HO₁: There is no significant difference between the mean achievement scores of students taught computer memory unit with Prezi presentation software (Experimental group) and those taught using the expository teaching method (Control group).

HO₂: There is no significant difference between the mean achievement scores of male and female students taught computer with Prezi presentation soft-

ware (Experimental group).

2.0 Research Method

A quasi-experimental research design was adopted for this study. Quasi experimental research design is described by Dodo (2007) in Uba (2014) as the design where the treatment variable is manipulated but the groups not equated prior to manipulation of independent variables. This study was carried out in public senior secondary schools in Enugu Education Zone of Enugu State. The population for the study

Table 2: Mean Achievement Scores and Standard Deviations of Male and Female SS II Students in Experimental group

Group	N	Pre-test mean	SD	Post-test mean	SD
Male (Experimental)	86	33.22	5.81	73.39	4.09
Female (Experimental)	91	29.89	4.35	54.55	5.01

comprised all the 2,259 Senior Secondary School (SS II) students in Enugu Education Zone of Enugu State. The composition of the population for each local government area was 985, 844 and 430 students for Enugu East, Enugu North and Isiuzo respectively. Also, there were 867 male and 1,422 female SS II students. The sample size was 328 SS II students. Purposive sampling was adopted to identify four out of the 23 senior public secondary schools in Enugu

Education Zone. The four schools drawn operate co-education and were considered to be better equipped for the study. This study also considered gender as a variable so as to have a basis for comparison in co-education schools. The instrument for data collection developed by the researcher was Computer Achievement Test (CAT).

CAT was a teacher made test which measured the current status of individual with respect to achieving

Table 3: Analysis of Covariance (ANCOVA) on the Mean Achievement Scores of Students in Experimental and Control Groups

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Decision
Corrected Model	2301.41	1	2301.41	5.088	.006	Rejected
Intercept	1229401.24	1	1229401.24	2231.86	.000	
GROUP	2505.31	1	2505.31	7.552	.006	
Error	170256.01	326	436.24			
Total	1622870.000	328				
Corrected Total	176050.22	327				

proficiency in a given area of knowledge and skills (specifically memory unit). It is made up of 40 multiple choice questions with four options each (A, B, C

and D). The CAT was administered as the pre-test and the items were rearranged and then re-administered to the SS II students as post-test after

the treatment. The experiment lasted for three weeks. The instrument was validated by three experts in the Department of Mathematics and Computer Education, Faculty of Education, Enugu State University of Science and Technology (ESUT). The reliability

estimate for CAT was determined using Kuder-Richardson formula (K-R₂₀). The instrument was administered to forty (40) SS II students in Boys' and Girls' secondary schools in Agbani Education Zone of Enugu State and data were collected and comput-

Table 4: Analysis of Covariance (ANCOVA) on the Mean achievement Scores of male and female Students in Experimental Group

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	65.421 ^a	1	65.421	.181	.678
Intercept	550251.033	1	550251.033	1528.101	.000
GENDER	61.298	1	61.298	.181	.678
Error	73691.009	175	442.054		
Total	801419.050	177			
Corrected Total	79038.109	176			

ed. A reliability coefficient of 0.81 was obtained, which means that CAT was highly reliable. Mean (\bar{x}) with standard deviations (s) were used in answering the research questions. In testing the hypotheses, Analysis of Covariance (ANCOVA) was used and the hypotheses were tested at 0.05 level of significance.

3.0 Results

3.1 Research Question 1

What are the mean achievement scores and standard deviations of students taught computer memory unit with Prezi presentation software (Experimental group) and those taught using the lecture teaching method (Control group) in both pre-test and post-test?

Table 1 above displayed the result of mean achievement scores and standard deviations of SS II students taught computer memory unit with Prezi presentation software (Experimental Group) and those taught with expository method (Control Group) in both pre-test and post-test. From the results of the analyses, the pre-test mean achievement score and standard deviation for the experimental group were (38.44) and (5.47) respectively, while the post-test mean achievement score and standard deviation were (73.86) and (6.11) respectively. On the other hand, for the control group, pre-test mean achievement score and standard deviation were (36.89) and (4.11) respectively, while post-test mean achievement score and standard deviation were (59.12) and (5.93) respectively.

From the analysis in Table 1, it shows that learning took place because the post-test mean score of students in experimental group is higher than the control group post-test mean score. This means that Prezi presentation software enhances students' academ-

ic achievement in computer memory unit more than the conventional method with a mean difference of (14.74).

3.2 Research Question 2

What are the mean achievement scores and standard deviations of male and female students taught computer memory unit with Prezi presentation software (Experimental group)?

From the results presented in Table 2 above, male students in the experimental group had pre-test mean achievement score and standard deviation of (33.22) and (5.81) respectively, while their post-test mean achievement score and standard deviation were (73.39) and (6.09) respectively. Female students in the experimental group had pre-test mean achievement score and standard deviation of (29.89) and (4.35) respectively, while their post-test mean achievement score and standard deviation were (54.55) and (5.01) respectively.

This implies that the use of Prezi presentation software is effective in enhancing computer memory unit in teaching and learning among the male students. It is also an indication that the results indicate that male students' recorded higher achievement than their female counterparts in the experimental group.

HO₁: There is no significant difference between the mean achievement scores of students taught computer memory unit with Prezi presentation software (Experimental group) and those taught using the expository teaching method (Control group).

Table 3 showed the Analysis of Covariance (ANCOVA) on the mean achievement scores of students taught computer memory unit by integrating Prezi presentation software in the teaching process

and those taught without integrating Prezi presentation software in the teaching process. In the table, group (experimental and control) as main effect, gave an F-value of 5.088 and was significant at 0.006. Since 0.006 was less than 0.05, this meant that at 0.05 significant level, the F-value was significant. Hence, hypothesis 1 was rejected as stated. The study therefore, concluded that there was significant difference between the mean achievement scores of students taught computer memory unit by integrating PPS in the teaching process and those taught without integrating PPS in the teaching process.

HO₂: There is no significant difference between the mean achievement scores of male and female students taught computer with Prezi presentation software (Experimental group).

Table 4 showed the Analysis of Covariance (ANCOVA) on the mean achievement scores of male and female students taught computer memory unit with PPS in the teaching process. In the table, gender as main effect, gave an F-value of 0.181 and was not significant at 0.678. Since 0.678 was not less than 0.05, this meant that at 0.05 significant level, the F-value was not significant. Hence, hypothesis 2 was not rejected as stated. The study, therefore, concluded that there was no significant difference between the mean achievement scores of male and female students taught computer memory unit with PPS in the teaching process.

4.0 Discussion of Findings

The findings showed the mean achievement scores and standard deviations of students that were taught memory unit with Prezi presentation software (Experimental Group) and those taught with expository method (Control Group) in both pre-test and post-test. From the table, it was found that students taught memory unit with Prezi presentation software recorded higher achievement than those taught with expository method.

There was a significant difference between the mean achievement scores of the experimental and control groups using ANCOVA. These findings agreed with Ward, Stoker and Muray-Ward (2011) that Prezi produced higher achievement than the expository method in the teaching of computer studies because of its interactive nature. The finding is, however, in contrast with the submissions of Guan (2009), Montazemi (2006) and Rasch and Schnotz (2009), who reported poor achievement of students taught with multimedia. The results show that the integration of Prezi presentation software in the teaching of computer studies should be recommended in schools. This is necessary to improve students' achievement in computer studies.

The findings also showed the mean achievement scores and standard deviations of male and female students taught memory unit with Prezi presentation

software (Experimental group). From the table, it was found that male students recorded higher achievement than their female counterparts in the experimental group. This finding agreed with Abkpa (2011) who found that male students performed better than their female counterparts when taught with modern technological devices. The finding is also in line with Gonzalez and Birch (2009) who submitted that students taught using modern technology performed significantly better than those taught using the traditional expository method and that gender had a significant influence on the students' achievement with the males outperforming their female counterparts. This is an indication that the female students should be encouraged in order to attain same academic height with their male counterparts.

5.0 Conclusion

Based on the findings of the study, it was concluded that:

Students achieved better when taught with Prezi presentation software than when taught with lecture method.

Male students achieved better than female students in computer studies when taught with Prezi presentation software.

Recommendations of the Study

Based on the findings of this study, the following recommendations were made:

Teachers should use Prezi presentation software, in which canvas is properly structured and arranged with life shots of natural phenomena in teaching topics in computer studies to enhance students' achievement in the subject.

Computer studies teachers should be provided with the facilities such as computers, storage devices and projectors which they need for preparing and teaching their lessons using Prezi presentation software.

Government should ensure adequate provision of media aided instructional materials for the effective teaching and learning of Computer studies.

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