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EFFECTS OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) APPLICATION ON ACADEMIC ACHIEVEMENT OF STUDENTS IN CHRISTIAN RELIGIOUS STUDIES IN CROSS RIVER STATE

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ABSTRACT: *This study investigates the effects of Information and Communication Technology (ICT) application on academic achievement of students in Christian Religious Studies (CRS). This was necessitated by the fact that so much has been said about the use of ICT in Science-based subjects but little, if any is known about the role of ICT in the teaching and learning of CRS. The research design adopted for the study is a quasi-experimental, randomized pretest-posttest experimental design. Eight (8) public secondary schools and eighty (80) Senior Secondary School One (SSS1) students in Cross River State were selected by stratified random sampling technique. Three research questions were answered and three null hypotheses were posited and tested at 0.05 level of significance. The research instruments used for the study is Sample Selection Pre-test 1 and 2 (SSPT1&2), Projected Video Package (PVP) and ICT Facility Observation Checklist (ICT-FOC). The gathered data are analyzed according to research questions and research hypotheses using mean percentage, standard deviation and Analysis of Covariance (ANCOVA). The findings of the study indicate that students taught using the Projected Video Package (PVP) performed better than those taught using the Conventional Instructional Strategy (CIS) in CRS; the male students revealed higher level of achievement compared to the female students; urban students that were taught using PVP performed better than those taught using CIS. Based on the findings, we recommend that educational authorities should train CRS teachers on the use of ICT in the classroom to enhance students understanding of the basic themes in Christian Religious Studies.*

KEYWORDS: Information and Communication Technology, Academic Achievement, Media Availability

INTRODUCTION

Decades ago, a converging set of global trends has not only created significant economic and social opportunities but also enormous challenges. The pervasiveness of information and communication technologies from cell phones to low-cost video cameras, personal digital assistants, and laptops wirelessly connected to the Internet has changed the way people live, work, and play. New knowledge and the use of new technologies have resulted in the creation of new products, services, and jobs, some of which were unimaginable. Its entrance into areas of men's activity, and its extension in the current century particularly in schools will become the most effective instrument to improve teaching and learning methods and promote educational goals (Ryan, 1991).

The use of ICT in Religious instruction seems to be nascent. Aikonen (2011) noted that the usage of ICT and nets in Religious Education Instruction came late in the 1990s with very little interest shown by churches, students and religious education instructors. Zinn (1964) is of the

opinion that computers used as teaching machines date from 1958; early development took place at IBM's Watson Research Centre and the University of Illinois. Thus, for over a period of thirty years, it was not employed in the teaching of Religious Education. Aikonen (2011) thus posits that since ICT has entered the classroom over the decades, pedagogical development should be encouraged through routine training of teachers in the use of ICT in Religious instruction. However, greater level of integration can be achieved through the involvement of teachers in developing curriculum contents and application of the appropriate media to enhance instruction.

The Current age is the information age, which requires having information and making relation for getting required information (Block, 2002). Many researchers view information society as multi structure and multi-dimensional society in which all layers and levels require information (Jenks, 2003). ICT has become a topic of discussion in the technological arena and its applications in different sectors and education in particular. Information and Communication Technologies (ICTs) are generally accepted as a modern education instrumental tool that enable the educators to modify the teaching methods they use in order to increase the students' performance.

In this 21st century, many factors bringing to bear on the adoption of ICT in education and contemporary trend suggest large scale changes in the way education is planned and delivered as a consequence of the opportunities and availability of ICT. The emergence of Information and Communication Technology (ICT) has revolutionized the existence and activities of contemporary man especially in the milieu of globalization (Evey, Emmanuel, Joseph, Dennis & Asinde, 2010).

Attempts have been made to establish relationship between information communication technology and human behavior. Ibe-Bassey (2000) and Inyang-Abia (2004) noted that media mediate in a continuum between stimulus response learning and cognitive learning to concretize ideas, concepts and facilitate learning. This reveals that ICT is capable of facilitating the collection, preparation, presentation, storage, retrieval, conveyance and dissemination of information. Ibe-Bassey (2000) and Inyang-Abia (2004) also identified such ICT media to include radio, television, computer and internet facilities, computer game console, DVD player and recorder, digital camera, scanner and the rest of them. In recent times, there has been intense advocacy both nationally and internationally for the application of ICT in teaching and learning process.

Nowadays, schools or learning institutes provide computer and Information Technology as the learning material to gain knowledge and experience. Students now have more understanding during teaching process. Internet especially provides many kinds of information and also learning tools in educational lines. The objective of the exercise is to prepare them in solving problems. One of the methods is by using multimedia activities. Besides learning, the teachers can attract the students' interest in learning process and they understand more if they learn by using something that will attract their interest. Therefore, by implementing ICTs in religious teaching process, it can improve the students' interest and also creative thinking. ICT plays some important roles which are to assist teachers in the teaching, providing them with tools to illustrate some points or processes as well as to support long distance educational system. On the part of the students, the importance of the ICT is to enable them to associate between concrete, tangible facts from the abstract ones, to help promote the students' retention and to facilitate the Simulation and Recovery phases.

ICT can be an excellent medium for training young people in learning about and appreciating the cultural values and heritage in its diversity. Computers and internet facilities are now available in many state owned and private schools. It is envisaged that educators will see ICT as a major teaching and learning device across all educational institutions. With its power of interactivity, multimedia and communication, the computer tends to be an excellent tool for Christian Religious Studies education. The idea is that students will be active participants rather than spectators in teaching and learning process. Psychologists agree that the best feedback is that which comes immediately after the event. What is more immediate than surfing the internet and getting the results wished for within minutes. Besides, many subjects in schools currently use ICT facilities during their lessons. The cross-curricular approach in Christian Religious Studies education may find a common base here by using computers during the subject lessons.

Concept of Information and Communication Technology

The society has so far undergone three phases in its socio-economic development. The first phase was the agricultural revolution, the second was industrial revolution and the third phase is the current information technology revolution (Kosongo, 1993). According to Daniels (2002) ICTs have become within a very short time, one of the basic building blocks of modern society. Many countries now regard understanding ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing and numeracy.

However, there appears to be a misconception that ICTs generally refers to 'computers and computing related activities'. This is fortunately not the case, although computers and their application play a significant role in modern information management, other technologies and/or systems also comprise of the phenomenon that is commonly regarded as ICTs. Pelgrum and Law (2003) state that near the end of the 1980s, the term 'computers' was replaced by 'IT' (Information Technology) signifying a shift of focus from computing technology to the capacity to store and retrieve information. This was followed by the introduction of the term 'ICT' (Information and Communication Technology) around 1992, when e-mail started to become available to the general public (Pelgrum, W.J., Law, N., 2003). According to a United Nations report (1999) ICTs cover Internet service provision, telecommunications equipment and services, information technology equipment and services, media and broadcasting, libraries and documentation centres, commercial information providers, network-based information services, and other related information and communication activities.

According to UNESCO (2002) information and communication technology (ICT) may be regarded as the combination of 'Informatics technology' with other related technology, specifically communication technology. The various kinds of ICT products available and having relevance to education, such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counselling, interactive voice response system, audiocassettes and CD ROMs etc. have been used in education for different purposes (Sharma, 2003; Sanyal, 2001; Bhattacharya and Sharma, 2007).

The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning, and research (Yusuf, 2005). A great deal of research has proven the benefits to the quality of education (Al-Ansari, 2006). ICTs have the potential to innovate, accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Davis and Tearle, 1999; Lemke and Coughlin, 1998; cited by

Yusuf, 2005).As Jhurree (2005) states, much has been said and reported about the impact of technology, especially computers, in education.

Initially computers were used to teach computer programming but the development of the microprocessor in the early 1970s saw the introduction of affordable microcomputers into schools at a rapid rate. Computers and applications of technology became more pervasive in society which led to a concern about the need for computing skills in everyday life.

Hepp, Hinostroza, Laval and Rehbein (2004) claim in their paper "Technology in Schools: Education, ICT and the Knowledge Society" that ICTs have been utilized in education ever since their inception, but they have not always been massively present. Although at that time computers have not been fully integrated in the learning of traditional subject matter, the commonly accepted rhetoric that education systems would need to prepare citizens for lifelong learning in an information society boosted interest in ICTs (Pelgrum, W.J., Law, N., 2003).

The 1990s was the decade of computer communications and information access, particularly with the popularity and accessibility of internet-based services such as electronic mail and the World Wide Web (www). At the same time the CD-ROM became the standard for distributing packaged software (replacing the floppy disk). As a result educators became more focused on the use of the technology to improve student learning as a rationale for investment.

Any discussion about the use of computer systems in schools is built upon an understanding of the link between schools, learning and computer technology. When the potential use of computers in schools was first mooted, the predominant conception was that students would be 'taught' by computers (Mevarech & Light, 1992).In a sense it was considered that the computer would 'take over' the teacher's job in much the same way as a robot computer may take over a welder's job. Collis (1989) refers to this as "a rather grim image" where "a small child sits alone with a computer".

However, the use of information and communication technologies in the educative process has been divided into two broad categories: ICTs for Education and ICTs in Education. ICTs for education refers to the development of information and communications technology specifically for teaching/learning purposes, while the ICTs in education involves the adoption of general components of information and communication technologies in the teaching learning process.

METHODOLOGY

This research is quasi-experimental study with pre-test and post-test model with control group that in it effect of using information and communication technology (ICT) on academic achievement of students in Senior Secondary School One (SSS1)in CRS. This design is considered most appropriate for some treat to validity cannot be properly controlled because of unavoidable situations associated with the study when human beings are used for experimental study (Nwankwo 2003). The population of interest in this study consists of all Senior Secondary School One (SS1) students in Cross River State while from this population, a sample of eighty (80) students from eight (8) public schools.The above sample size was obtained using a purposive and stratified random sampling technique. The criteria considered for the selections of the school that wasto be used for the experimental study were that:

(i) Christian Religious Knowledge is taught in SS1

(ii) The school has adequate ICT facilities.

Research Questions

1. How does the application of Projected Video Package (PVP) on students' academic achievement in Christian Religious Studies defers from the application of Conventional Instructional Strategy (CIS) on students' academic achievement in Christian Religious Studies?

2. What are the relative effects of the application of Projected Video Package (PVP) and conventional instructional strategy (CIS) on male and female students' academic achievement in Christian Religious Studies?

3. What is the effect of location on mean performances of students based on the usage of ICT tools in Christian Religious Studies in Cross River State?

Hypotheses

1. There is no significant difference between the mean performance of students taught with Projected Video Package (PVP) and those taught with conventional instructional strategy (CIS).

2. There is no significant difference between the mean performance of male and female students considering the application of Projected Video Package (PVP) and conventional instructional strategy (CIS).

3. There is no significant difference between the mean performances of students in urban and rural schools in Christian Religious Studies considering the usage of ICT tools.

Instruments

The research instruments used for the study were the Sample Selection Pre-test 1 and 2 (SSPT1 & SSPT2), Information and Communication Technology – Facilities Observational Checklist" (ICT-FOC) and test on Justification by Faith (CRSTJF). ICT-FOC will be design to observe ICT facilities in the secondary schools in the sampled area of the study.

SSPT1 & SSPT2 consists of ten (10) objective questions each having four options basically to determine the baseline knowledge of the students on Justification by faith, Old life and New life in Christ for the purpose of selection. One mark is allocated for each question making a total of ten marks each (Appendix C). the performance of students were classified into High Achievers (HA), Medium Achievers (MA), and Low Achievers (LA), and their mean scores were randomly selected to ensure that there is homogeneity in the intellectual ability of the selected students.

Information and Communication Technology – Facilities Observational Checklist" (ICT-FOC) consists of ICT facilities expected to be available and functional in computer laboratory. This instrument was employed to determine the school that will be used for the test.

Justification by Faith and New life in Christ consists of a lesson note that was taught using the Projected Video Package (PVP). Christian Religious Studies Test on Justification by Faith and New life in Christ (CRSTJF) is made up of questions developed on lessons in Justification by faith. This was used for both pre-test and post-test to measure students' performance on Christian Religious Studies

RESULTS AND DISCUSSIONS

Research Question 1

How does the application of Projected Video Package (PVP) on students' academic achievement in Christian Religious Studies defers from the application of Conventional Instructional Strategy (CIS) on students' academic achievement in Christian Religious Studies?

Table 1.1 Performances of Students that used projected video package and conventional instructional strategy.

Treatment	Test	No.	Mean	Mean Gain	Mean Gain %
Conventional instructional strategy	Pre-test	40	28.798	10.652	36.989
	Post-test		39.450		
Projected video package	Pre-test	40	28.987	16.136	55.666
	Post-test		45.123		

Source: researcher's fieldwork, 2015.

From the table above, it was shown that the students that used the projected video package in the lesson of Justification by Faith had a gain of 16.136 while those that used the conventional instructional strategy in the lesson of Justification by faith had gain of 10.652 when the pre-test and post-test were compared. The percentage mean gain also revealed that students that used the projected video package had a mean gain of 55.666 while those that used the conventional video strategy had percentage mean gain of 36.989. Based on the analyzed data in the above table, students that used the projected video package in the lesson, Justification of Faith performed better than those that used the conventional instructional strategy.

Research Question 2

What is the effect of location on mean performances of students considering the usage of ICT tools in Christian Religious Studies in Cross Rivers State?

Table 1.2: The Performances of students in terms of school location and ICT usage

Treatment	Location	Test	Mean	Mean Gain	Mean gain %
Conventional instructional strategy	Rural	Pre-test	28.896	10.604	36.697
		Post-test	39.500		
	Urban	Pre-test	28.700	10.700	37.282
		Post-test	39.400		
Projected video package	Rural	Pre-test	27.722	14.970	54.000
		Post-test	42.692		
	Urban	Pre-test	30.253	17.302	57.191
		Post-test	47.555		

Source: researcher's fieldwork 2015.

The table above showed students performances in terms of utilization of Information and Communication Technology (ICT) tools and location of students. It was shown that urban students that used the Projected Video Package (PVP) performed better than the rural students that used theProjected Video Package (PVP) indicating mean gain of 17.302 as against 14.970. Also the rural students that used the conventional instructional strategy (CIS) had a gain of 10.604 while the urban students that used the CIS had a gain of 10.700.

Research Question 3

What are the relative effects of the application of Projected Video Package (PVP) and conventional instructional strategy (CIS) on male and female students' academic achievement in Christian Religious Studies?

Table 1.3: The Performances of male and female students that used projected video package and conventional instructional package

Treatment	Sex	Test	Mean	Mean Gain	Mean Gain %
Conventional instructional package	Male	Pre-test	33.108	10.917	32.974
		Post-test	44.025		
	Female	Pre-test	24.487	10.388	42.432
		Post-test	34.875		
Projected video package	Male	Pre-test	34.038	18.686	55.432
		Post-test	52.906		
	Female	Pre-test	23.937	13.404	55.997
		Post-test	37.341		

Source: Researcher's fieldwork 2015

The result shown in table 4.3 above revealed that the post-test mean value in terms of gender and utilization of projected video package (PVP) and conventional instructional strategy (CIS) were higher than the pre-test mean values. The performance gain of students that used PVP for male was 18.868 while that of female was 13.404. This indicate that male students that PVP performed better than their female counterpart. The table also showed the performances of both male and female students that used CIS. The students (CIS) had a gain of 10.917, while the female students (CIS) had a gain of 10.388 indicating that the male (CIS) students performed better than the female students.

Univariate Analysis of variance of the main effects and their interactions

source	Type III sum of squares	Df	Mean Square	F	Sig.
Corrected Model	14000.983[a]	15	933.399	22.639	S
Intercept	195303.828	1	195303.828	4.737E3	S
Treatment	**331.270**	**1**	**331.270**	**8.035**	**S**
Location	121.372	1	121.372	2.944	ns
Sex	4545.732	1	4545.732	110.255	S
Test	6915.498	1	6915.498	167.733	S
Treatment * Location	**142.451**	**1**	**142.451**	**3.455**	**ns**
Treatment * Sex	**150.188**	**1**	**150.188**	**3.643**	**ns**
Treatment * Test	289.811	1	289.811	7.029	S
Location * Sex	42.061	1	42.061	1.020	ns
Location * Test	14.207	1	14.207	.345	ns
Sex * Test	86.489	1	86.489	2.098	ns
Error	5937.017	144	41.229		
Total	233098.000	160			
Corrected Total	19938.000	159			

a. R Square = .702 (Adjusted R Squared = .671)

S= significant; ns = not significant

As shown in Table 1.4, the calculated $F_{1, 144}$and value 8.035 at degree of freedom of 1,144 and the probability level of .05 against $F_{1, 144}$critical value of 3.84. Since F value is greater than the F table value, the null hypothesis is rejected and the alternative hypothesis is accepted. This indicates that there is significant difference between the mean performances of students taught with projected video package and those taught with conventional instructional strategy. Furthermore, it is shown that the interaction between treatment and gender is not significant since its calculated $F_{1,144}$ value is 3.643 at degree of freedom of 1,144 and probability level of 0.05 against the $F_{1,144}$ critical value of 3.840. Since the calculated F value is less than the F table value, the null hypothesis is upheld. This showed that there is no significant difference between the mean performance of male and female students taught justification by faith and new life in Christ considering the teaching approach (projected video package and conventional instructional strategy).

The univariate analysis of variance of Table 1.4 shows the interactive effects between treatment and location. It was observed that the calculated $F_{1,144}$ value is 3.455 at degree of freedom of 1,144 and the probability level of 0.05 against the $F_{1,144}$ critical value of 3.840. This implies that there is no significant difference between the mean performances of students in urban and

rural schools in Christian Religious Studies considering the projected video package and conventional instruction package.

CONCLUSION AND RECOMMENDATIONS

From the discussion, it is seen that the use of ICT in teaching and learning helps students to expand knowledge, experience and increase understanding, especially in the Christian Religious Studies that require visual, audio, maps, video presentation and so on. The findings concluded that using ICT in CRS lessons has positive impact on students' achievements. Schools must strive to increase usage of ICT amongst teachers. On the other hand, teachers should put more effort to use ICT in their CRS lesson in order to increase students' achievements. Teachers who are weak in the use of ICT need to participate in ICT training courses. ICT facilities provided by the government in schools must be fully utilized by the teachers.

Using ICT in CRS lesson also help students to understand CRS concepts through a relationship with a real life situation. The use of ICT in CRS lessons improves students' achievements compared to using traditional approaches. Moreover, it makes teaching and learning process become more interesting, encouraging and effective. Using ICT in study encourages students to process information better and thus enhances the understanding and improves students' memory (Hull 1995; Gayeski, 1993).

In terms of location, the study concluded that urban students that were taught using ICT tool (PVP) performed better than the students that were taught using the conventional instructional package. It is worth noting that access to ICT facilities and actual levels of access and use of computers by students in the school could have apositive effect of future productivity levels (Judge, 2005).

Both gender showed improvement in the subject. However, male students had greater achievement than female students. Differences in cognitive style, interest and motivation between boys and girls might be the causes of the difference in their achievements. Following Kogan (1971), boys were more cognitive than girls. Hence, when ICT was used in the CRS lesson, we can see the differences in both genders' achievements. It is concluded that ICT promotes better learning outcomes on male students' achievement in CRS. The overall conclusion from this study reveals that ICT has a significant and positive impact on teaching and learning specifically for Christian Religious Studies. ICT contributes greater performance or achievement of students. Teachers should replace traditional teaching approach with attractive learning style by involving ICT in their lesson.

RECOMMENDATIONS

Based on the study, there is the need:

1. To train Christian Religious Studies teachers on the use of ICT in the classroom to enhance students' understanding in basic themes in religion.

2. That the curriculum for training and retraining of teachers should be reviewed to adequately furnish students with the basic skills of handling all instructional materials that are needed for effective teaching and learning.
3. That ICT training should be inculcated in the curriculum at all levels as a general study that will be compulsory throughout the period of study.
4. That pilot program should be organized to equip all teachers that will be posted to all school as pioneers.
5. That the teachers should be encouraged to show professionalism in the classroom and other aspect of learning that can help students to achieve greater level of academic performance.
6. That ICT centres should be provided at all levels of education and should be equipped with functional systems and manpower.

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