EFFECT OF COMPUTER ANIMATION INSTRUCTIONAL PACKAGE ON SECONDARY SCHOOL STUDENTS' ACADEMIC ACHIEVEMENT IN CHRISTIAN RELIGIOUS STUDIES IN DELTA STATE

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Abstract

Christian Religious Studies (CRS) is one of the important subjects taught in secondary schools in Nigeria but has witnessed poor achievement by students. Teachers are faced with the need to look out for innovative instructional package that could enhance learning, in order to improve students' academic achievement. This study investigated the effect of computer animation instructional package on secondary school students' achievement in CRS in Asaba Education Zone of Delta State. Two research questions guided the study and there null hypotheses were tested. The study adopted a quasi-experimental design. Specifically, pretest-posttest non-equivalent control group design involving 2x2x2 factorial model. Population of the study consisted of 2,927 SS2 CRS students in the 52 public secondary schools in the zone used. The sample consisted of 186 students drawn from four intact classes from two co-educational secondary schools out of the 40 co-educational secondary schools in Asaba Education Zone. One of the schools was randomly assigned to experimental group while the other was assigned to control group. Christian Religious Studies Achievement Test (CRSAT) was the instrument used to collect data for the study. The instrument was validated by experts. The CRSAT was trial tested on an intact class of 40 students from Agbor Education Zone. The reliability coefficient of CRSAT was established to be 0.87 using Kuder Richardson (KR-20). The CRSAT was administered to the students as pretest and posttest for data collection. Mean and standard deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the null hypotheses at 0.05 level of significance. The result revealed among others that the experimental group achieved higher than the control group because the use of computer animation instructional package stimulated and encouraged the students to participate actively in the lessons. Again, there was significant interaction effect of teaching method and gender on students' mean achievement scores in CRS. Based on the results of the study, it was recommended among others that computer animation instructional package should be adopted by teachers for teaching CRS concepts to secondary school students.

Keywords: Education, Computer animation instructional package, Students, and Academic achievement.

Introduction

Education is recognised as the nation's greatest asset towards the quick development of its economic potentials, sociological, governmental and human resources, hence it focuses on the integration of the individual into the society. Sustainable human and social development may remain elusive without sustainable and progressive education. The Federal Republic of Nigeria (FRN, 2014) in the National Policy on Education through the national educational goals expressed that the acquisition of appropriate knowledge, skills, competencies, development of mental, physical and social abilities equip individuals to live in and contribute meaningfully to the development of the society. The knowledge, skills and competencies acquired from the school will help the individual to understand the economic, religious and political situation of their nation and that will influence and boost their present and future standard of living. In support of this assertion, Obi (2015) stated that, in order to be a good member of the society, the individual should have a sound grasp of the functions of political, economic and religious values and principles in the society as well as acquire the ability to use its services in taking rational decisions in everyday life. Some elements of rational decision-making by an individual such as, religious knowledge, skills and values are found in a qualitative education given in an educational setting. Quality education ensures that subjects taught are learned and internalized by students for proper functioning in the human society and for their development as good citizens. One of the subjects which help to nurture the spirit of good citizenship in students is Christian Religious Studies (CRS).

Christian Religious Studies (CRS) is the subject that inculcates and embraces morals, virtues, norms and mutual fellowship with people in the society. The importance of CRS cannot be overemphasized as it teaches students how to be a good person in the society using historical illustrations from Christian handbook called Bible and other approved books. It can be called the subject of humanity since it promotes godly relationship with God and man. CRS has been one of the subjects that foster peace and unity among diverse cultures in the society such as Nigeria as well as enhancing growth and development in general. Sequel to the above, Christian Religious Studies Education is the academic field of multi-disciplinary secular study of religious beliefs, behaviours and institutions. CRS describes, compares, interprets and explains religion, emphasizing systematic historically based and cross-cultural perspectives. CRS education originated in the nineteenth century when scholarly and historical analysis of the Bible had flourished because of the misinterpretation, misrepresentation and misformulation adaptation of the Bible (The Holy Book or Book of Books or Book of the Divine (God)). In view of the importance of CRS, Okon (2010) opined

that it is used to regulate the behavioural activities in the society as to knowing what is good and godly which the society uses to foster peace and maintain law and order as well. CRS is a veritable subject or course of study, under the educational curriculum; Christian Religious Studies is also a core subject for all Art students who are Christians at the Senior School level and it is a compulsory subject for students who wish to study humanity at tertiary level (FRN, 2014).

Despite the importance accorded to CRS for the proper development and functioning of citizens, in Delta State, academic achievement of students in CRS is still poor. No wonder Kalu in Ikwuka and Adigwe (2021) posited that, students seem not to be interested in learning the subject anymore. For instance, the yearly result of the Senior School Certificate Examination result (SSCE) conducted by West African Examination Council (WAEC) from 2018 to 2022 provided evidence of poor students' achievement in CRS. The WAEC Chief Examiner's Report of 2022 in CRS for Delta State revealed poor achievement of students in the sub-division area of CRS. According to the Chief Examiner, in 2018, 37.86% had credit while 62.14% failed, 2019, 50.94% passed while 49.06% failed, 2020, 44.90% had credit while 55.1% failed, in 2021, 42.20% credited the subject while 57.80% failed and finally, in 2022, 41.10% passed while 58.9% failed the subject. These situations are worrisome given the fact that academic achievement is central to students' learning process.

This poor performance of students in CRS calls for serious action to remedy the situation. Students' achievement in CRS has always been a topic for discussion among teachers, parents, counsellors and researchers. In the past, several attempts have been made at solving these problems but such efforts had focused more on ways of improving the popular conventional methods of teaching Christian Religious Studies. CRS for instance, the Chief Examiners Reports (2021) suggested remedies to overcome candidate's weakness which included among others that: they should show greater commitment and interest in the subject, they should work hard to cover the syllabus and revise with past question papers. Again, the need to re-orientate the interest of candidates on CRS is important. Most candidates feel that they do not need the subject and in most cases, they only register it to complete their minimum subject requirements thus, they show nonchalant attitude towards it. Several researchers postulated that some factors may cause this poor performance in the subject which among others includes teaching methods, interest of the students, attitude, student-teacher relationship, attitude of the teacher, and lack of the use of innovative teaching methods in the classroom. It seems that little or no attention has been given to the use of innovative teaching methods such as the use of Information and Communication Technology (ICT) in CRS curriculum delivery. Good enough, in this 21st century, teaching and learning have been revolutionized with the introduction of ICT gadgets into modern classrooms. ICT provides myriads of innovative technologies that help in transforming learning from teacher- centred and text-bound classroom into rich student-centred and interactive epistemological environment.

The instructional delivery package adopted by the teacher determine its important roles in enhancing learning and students' acquisition of innovative skills and knowledge competency. The quality of instruction received by students depends on the quality of teachers. There is a strong positive relationship between teachers' level of knowledge of subjects and levels of subject knowledge achieved by their students (Ozbey (2017). For any subject to be effectively taught therefore, there should be trained and qualified teachers employing appropriate instructional strategies. This implies that for the effective teaching and learning of CRS, teachers have to adopt appropriate instructional strategies that will be instructive and appealing to students, arouse their interest and foster positive attitude as well as improve their retention ability to enable them achieve excellent results. The use of instructional strategies that require students to be more actively involved in the learning process is therefore strongly advocated in primary and secondary schools in Nigeria especially in Delta State. It appears that learning-by-doing, by activity, by mastery or by computer aided instruction could be the most suitable form of instructional method for teaching and learning at the senior secondary school education level. Since we are in computer age now, integrating ICT into classroom instruction could boast achievement and interest of students in secondary school subjects like CRS. According to Kpangban and Onwuegbu (2018), instructional strategy can be viewed as the type of activity pursued by teachers and pupils together in a group work, surveys, demonstrations, films and TV viewing, which are intended to help students achieve stated lesson objectives or learning outcomes. Sagor in Ikeanumba (2019) stated that reliance on the traditional conventional teaching method has been criticized as it molds students into passive recipient of information transmitted by the teacher and makes them highly dependent on the teachers for much of their learning needs.

Conventional method of teaching is a teacher-led method of instruction which some teachers prefer to use in their lesson delivery. Conventional methods amongst others include; lecture method, discussion, project method, demonstration and discovery method. These methods are popular and often used by teachers to disseminate information, knowledge and skills to students (Chikendu and Okoli, 2020). Conventional Lecture Method (CLM), according to Bandura in Ikeanumba (2019) is a traditional method of teaching in which knowledge flows from the teacher to the students. It is a process in which teachers do the talking while the learners absorb by listening passively. Conventional lecture method allows the use of board with chalk/marker supported by oral demonstration, narration and explanation during classroom lesson. Gambari, Yusuf and Balogun (2014) stressed that most of Nigerian classrooms from pre-primary to tertiary institutions are dominated by chalkboards and marker-board. They further argued that this method of conventional instructional delivery has the limitation of ineffectiveness for very large group instruction, inability to allow information storage for future use, inability to accommodate illustrations to support the teaching; health hazard for teachers from chalk particles and it makes learning uninteresting and so on. Conventional

lecture method allow the use of board which students find boring as they are involved very little in the learning process. In other words, students in the conventional lecture classes are passive, and do more of listening and writing note. It focuses on teaching, not learning (Greenberg in Ikeanumba, 2019). CLM widens initial individual differences because slow learners are unable to acquire the prerequisites to comprehend subsequent units with the limited amount of instructional time provided.

Teachers believe that learning may be planned and organized in such a way that every student can perform and learn to achieve more academically according to their capabilities (Lamidi, Oyelekan and Olorundare, 2015). In order to achieve such goal, individual training strategies such as mastery learning, guided discovery, peer tutoring, co-operative learning, Computer animation instruction, among others, are veritable strategies as students learn according to their own capabilities. The effectiveness of the use of electronic technology (like computer animation instruction) in teaching in present day CRS classrooms is a subject of research by many CRS educators and other researchers. Electronic technology in today's society is steadily and constantly advancing and finding its way into CRS classrooms. Christian Religious Studies (CRS) teachers now have a variety of technologies available to them for use in CRS curriculum delivery such as computer animation package of instructional delivery. To this end, the adoption of technology-based instructional delivery that motivate, captivate, interest and enhance students' academic achievement and retention should be encouraged. Such gadgets as computers, projectors, animation, video, interactive whiteboard, animation and other multimedia gadgets are necessary in teaching and learning of pre primary, primary, and tertiary courses. One of such technology-based instructional package used to enhance learning multimedia presentation is computer animation package instruction.

Computer animation instruction is a modern electronic technological instructional method that offers deep learning to students using animated objects. Computer animation is traditionally defined as an inanimate entity that appears to take on dynamic attributes such as movement, growth and speech which are normally associated with living organisms using computer (Ploatzner and Lowe, 2012). A typical example of computer animation could be likened to the robot which is seen on television performing the action of cooking or gathering items into a basket. Computer animation has been educationally defined by Lander and Lunderstorm (2019) as a set of varying images presented dynamically according to users' action in ways that help the user perceive a continuous change over time and develop a more appropriate mental model of a task. Computer animation is essentially a digital successor to the stop motion techniques used in traditional animation with 3D models and frame-by-frame 2D illustrations. Computer generated animations are more controllable than other more physically-based processes. Computer animation instruction has the potency of bringing down the difficult level of any concept taught with it to the barest minimum. It is a combination of graphics and text presentation in which each can strengthen memory through observation of the images. It is audio-visual in nature. The

use of audio-visual materials is important for teaching CRS concepts. Benefits of Computer animation instruction are enormous. Any learning associated with Computer animation instruction provides a learning environment free of emotional stress and enhances emotional intelligence that provides fun. Computer animation instruction provides unique and interesting presentation given to each of the facts and concepts presented, making it beneficial to students. Modules aided with Computer animation instruction, according to Aminordin (2021), is an effective way to attract attention and be able to provide concrete information on the movement and change of the object over time and this can reduce the level of abstract ideas. It attracts students' attention easily and delivery of message more appropriately. Chikwendu and Okoli (2020) opined that the use of computer animation instruction facilitates explanation of a concept or demonstrates a skill and this enables students to utilize more senses in the process of gathering information as well as sustain the students' attention and interest for a longer period of time.

There exist some possible challenges associated with computer animation instruction. Instructional animation will not work well where there is epileptic supply of electricity. The students may be carried away and watch the video images as though they are watching film show without picking the important aspects of the lesson. The school may not have enough computers to go round the students at once. These notwithstanding, anyone using computer animation instructional package should bear these challenges in mind and make provisions to arrest them so that students would achieve better academically.

Academic achievement is an important factor in the teaching and learning of any subject including CRS. Academic achievement is the outcome of instruction; it depicts the extent to which the goal of instruction has been achieved both by the teacher and by the students (Mbaegbu, Ikeanumba and Anazodo, 2023). Academic achievement is the knowledge acquired and skills developed in schools (Vein, et al. 2013). It describes the scholastic standing of the student at any given time. The scholastic standing could be expressed in terms of scores obtained in tests and examinations assessment whether internal or external. Rivers (2016) operationalized academic achievement in his study as grade point average obtained from self-report questionnaire while Texas Education Agency (TEA, 2018) sees academic achievement as learners Standardize Value of Cumulative Grade Point Average (SVCGPA) in college. Academic achievement as viewed by Kpolovie, et al. (2014) is referred to be the observed and measured aspects of students' mastery of skills and subject contents as measured with valid and reliable test. In any school system, academic achievement is a priority to the student as well as the teacher. The teacher, students and the school administration must put effort to see that high academic achievement is attained. In this study, the researcher operationalizes academic achievement as students' scores in teacher made tests in CRS. Academic achievement is a measure of how much the students have fulfilled the goal of instruction. It is often determined through the use of standardized test or other assessment methods.

The use of electronic instructional delivery package utilizes demonstration in which the teacher sometimes plays the role of the principal actor while the learners watch with the intention to act later. In this, learning is demonstrated through electronic gadget with step-by-step explanation process to the learners (Amal and Sakar 2018). Most instructional delivery package are tools for learning in narration presentation formats and illustrations. For Mundi (2016), the use of instructional delivery package accelerate the display, visualization or exhibition of usually learning objectives evoking keen interest of the learners. Although, electronic instructional delivery package save time and facilitate material economy, induces learner's attention with powerful motivation in lesson delivery, encourage students' immediate feedback, and provide a real-life situation of course of study; most times, the cost of its maintenance make them unachievable for most schools in third world countries. Despite this challenge, Gambari, Shittu, Falode and Adegunna, (2016) stressed that in this 21st century, adoption of technology-based instructional strategy that motivate, captivate and enhance students' achievement and retention should be encouraged. One of such approaches, according to Gambari, Ezenwa and Anyanwu (2014), Gambari and Adamu (2013), Adegoke (2010); is technology enhanced learning such as computer animation instruction. Gambari, (2021) outlined that the results of the use of computer animation instruction in lesson delivery in other countries like China, Brazil, Germany, among others across other subjects Physics, Mathematics and Chemistry yielded a remarkable improvement in the students understanding and academic achievement in CRS. Gambari, et al. (2014) further posited that adoption of technology-based instructional strategy may influence the gender of learners in their achievement. Academic achievement of students in CRS may therefore be influenced by the gender of learners due to the use of computer animation instructional strategy.

The issue of gender and academic achievement and interest appears to centre generally on the extent to which males and females perform differently in different subjects. Gender influence on students' academic achievement is a crucial matter to stakeholders in education. Adigun, et al (2015) asserted that gender is the range of physical, biological, mental and behavioural characteristics pertaining to and differentiating between the feminine and masculine (female and male) population. Researches carried out on gender differences in school subjects using ICT-related instructional package by Nwaokwa and Okoli (2021), Ifeakor (2019), Ikwuka and Samuel (2017), and Ikwuka and Adigwe (2017) have suggested that females achieved better than males in non-science subjects while males achieved better than females in school subjects such as CRS. There have been contradictory reports regarding the academic achievement of male and female students' taught with computer-aided instruction. For instance, Gambari, Yusuf and Balogun (2012) reported that there was no significant difference in the achievement of male and female students taught using power point instructional package. In the same vein, Gambari, et al. (2016) reported that gender has no significant effect in the mean scores of students taught using video instructional package. On the contrary,

Sakiyo, Musa and Waziri (2018) reported that there was significant difference in the academic achievement of students based on gender when taught using multimedia (video and power point) instructional packages. In a similar study, Gambari, et al. (2014) reported that there was no significant difference in the interest of male and female students taught geography using f two modes of computer-assisted instructional package. It does appear that these gender differences in students' achievement vary with the method of instruction.

Computer animation instructional package if well managed enables learners accomplish a high level of understanding in a given area if they are given enough time. There are therefore evidences from literature that few researchers have done studies investigating the effects of computer animation instructional package on some learning outcome like achievement among students. Moreover, no studies have been carried out on the effects of computer animation instructional package on students' academic achievement in CRS within and outside the country to the best of the researcher's knowledge. In this regard, it is of great importance to demonstrate how to use computer animation instructional package in secondary school classes and to reveal how this package affects students' academic achievement in CRS. There is need for teachers to exploit computer animation instructional package in different subject areas. Upon this background, the study sought to investigate effect of computer animation instructional package on academic achievement of students in CRS in Delta State of Nigeria.

1.2 Statement of the Problem

Students achieve poorly in CRS in secondary schools External Examinations in Nigeria as was confirmed by WAEC Chief Examiner's report of 2022. Also, the analysis of WAEC results for 2018 to 2022 for Delta State equally revealed poor achievement though an improvement was seen but the problem is still not remedied. This point to factors such as the students' lack of understanding of the subject, teachers use of teaching method, attitude of the students, among others. This situation is partly attributed to teachers' poor method of lesson delivery, passivity and lack of interest by the students. The poor academic achievement has been a concern to many. CRS teachers are making effort to adjust the method of lesson delivery to improve the situation but they have not been given much attention to technology driven method like Computer animation instruction. One wonders if the use of computer instructional package would also enhance students' achievement in CRS in Delta State. Hence, the present study investigated the effect of computer animation instructional package on students' academic achievement in CRS in Delta State, Nigeria.

Research Questions

The following research questions guided the study.

1. What are the mean achievement scores of secondary school students taught CRS using computer animation instructional package (CAIP) and those taught using conventional lecture method (CLM)?
2. What are the mean achievement scores of secondary school male and female students taught CRS using computer animation instructional package (CAIP)?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

1. There is no significant difference in the mean achievement scores of secondary school students taught CRS using computer animation instructional package (CAIP) and those taught using conventional lecture method (CLM).
2. There is no significant difference in the mean achievement scores of male and female secondary school students taught CRS using computer animation instructional package (CAIP).
3. There is no interaction effect of teaching methods (CAIP and CLM) and gender on academic achievement of students in CRS.

Materials and Methods

The study adopted a quasi-experimental design. Specifically, pretest-posttest non-equivalent control group design involving 2x2x2 factorial model. Population of the study consisted of 2,927 SS2 CRS students in the 52 public secondary schools in the zone used. The sample consisted of 186 students drawn from four intact classes from two co-educational secondary schools out of the 40 co-educational secondary schools in Asaba Education Zone. One of the schools was randomly assigned to experimental group while the other was assigned to control group. Christian Religious Studies Achievement Test (CRSAT) was the instrument used to collect data for the study. The instrument was validated by experts. The CRSAT was trial tested on an intact class of 40 students from Agbor Education Zone. The reliability coefficient of CRSAT was established to be 0.87 using Kuder Richardson (KR-20). The CRSAT was administered to the students as pretest and posttest for data collection. Mean and standard deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the null hypotheses at 0.05 level of significance.

Results

Research Question 1: What are the mean achievement scores of secondary school students taught CRS using computer animation instructional package and those taught using conventional lecture method?

Table 1: Achievement Mean Scores of Secondary School Students taught Christian Religious Studies using Computer Animation Instructional Package and Conventional Lecture Method

Sources of Variation	N	Pretest		Posttest		Mean Gain
		Mean	SD	Mean	SD	
Computer Animation Group	95	13.75	3.01	23.83	3.18	10.08
Conventional Lecture Group	91	13.85	3.17	18.48	3.14	4.63
Mean Difference		0.10		5.35		5.45

Table 1 showed the mean and standard deviation of students' scores in experimental and control groups. The table revealed that the pretest mean achievement score of students in experimental group taught CRS using computer animation instructional package was 13.75 with a standard deviation of 3.01 while students in the control group using the lecture method had

mean achievement score of 13.85 and a standard deviation of 3.17. The mean difference between the two groups was 0.10 which implies that the groups were of close cognitive abilities before the treatment since the mean difference was considered small. Table 1 also revealed that the posttest mean achievement scores of students in experimental group was 23.83 with a standard deviation of 3.18 while students in the control group had mean achievement score of 18.48 and a standard deviation of 3.14 with an achievement mean gain of 10.08. The mean difference between the two groups was 5.35 in favour of experimental group. Thus, the experimental group achieved higher than the control group because the use of computer animation instructional package stimulated and encouraged the students to participate actively in the lessons. The mean difference at the posttest was observed to be higher than that of the pretest suggesting the groups were no longer of the same cognitive abilities. Nevertheless, the students in the control group increased their achievement from13.85 to18.48 with a mean gain of 4.63.

Research Question 2: What are the mean achievement scores of secondary school male and female students taught CRS using computer animation instructional package?

Table 2: Achievement Mean Scores of Secondary School Male and Female Students taught Christian Religious Studies using Computer Animation Instructional Package

Sources of Variation	N	Pretest		Posttest		Mean Gain
		Mean	SD	Mean	SD	
Male	45	13.70	2.85	24.07	3.03	10.37
Female	50	13.60	2.94	23.60	3.36	10.00
Mean Difference		0.10		0.46		0.37

Table 2 showed the mean and standard deviation of the academic achievement of male and female students' scores in the experimental group. The table revealed that the pretest mean achievement score of male students in experimental group was 13.70 and a standard deviation of 2.85 while their female counterparts had mean achievement score of 13.60 and a standard deviation of 2.94. The mean difference between the two groups was 0.10 in favour of male students. Table 2 also revealed that the posttest mean score of male students exposed to computer animation instructional package was 24.07 and a standard deviation of 3.03 while the female students in the experimental group had a mean achievement score of 23.60 and a standard deviation of 3.36. The mean difference between male and female scores was 0.47 in favour of male students which was considered small. This showed that the male students had almost the same achievement level like their female counterparts in CRS academic achievement test.

Hypotheses

Hypothesis 1: There is no significant difference in the mean achievement scores of secondary school students taught CRS using computer animation instructional package and those taught using conventional lecture method.

Table 5: ANCOVA on the Achievement Mean Scores of Secondary School Students Taught CRS using Computer Animation Instructional Package and Those Taught with Conventional Lecture Method

Source	SS	df	Mean Square	F	Sig.
Corrected Model	866.16[a]	4	433.08	43.31	.00
Intercept	2182.76	1	2182.76	218.37	.00
Pretest	7.48	1	7.48	.75	.39
Method	863.07	1	863.07	86.32	.00
Gender	46.481	1	46.481	.249	.620
Method * Gender	**111.647**	**1**	**111.647**	**.597**	**.442**
Error	1169.84	181	9.99		
Total	55757.00	186			
Corrected Total	2035.99	186			

a. R Squared = .43 (Adjusted R Squared = .42)
* denotes F is significant at 0.05 alpha level.

Table 3 showed one-way ANCOVA test of CRS students' achievement scores in computer animation instructional strategy and lecture method. Pretest scores were used as covariate to control the initial difference in the two methods. The result from the Table 3 revealed that F 1,185 = 86.32, and p = 0.00 for the main treatment. The significant value p-value (0.00) was less than the set significant value of the study ($p < 0.05$). Therefore, the null hypothesis that stated that there is no significant difference in the mean achievement scores of students taught CRS using computer animation instructional strategy and those taught by conventional method was rejected. The conclusion drawn was that there exists a significant difference in the achievement of CRS students exposed to computer animation instructional strategy and lecture method. This indicates that there is statistically significant difference between the mean achievement scores of the experimental and the control methods of teaching. The experimental group exposed to computer animation instructional strategy achieved better than the control group taught using modified lecture method since the estimated effect size of ANCOVA test was considered significant. This suggests the need to deviate from conventional method to computer animation instructional strategy in order to adjust in line with the paradigm shift in education pedagogy.

Hypothesis 2: There is no significant difference in the mean achievement scores of male and female secondary school students taught CRS computer animation instructional package.

Table 4: ANCOVA Test of Male and Female Students' Achievement Scores in Computer Animation Instructional Package

Source	SS	df	Mean Square	F	Sig.
Corrected Model	4.85[a]	2	2.43	.23	.79
Intercept	1332.60	1	1332.60	.42	.00
Pretest	1.59	1	1.59	.15	.69
Gender	**3.186**	**1**	**3.19**	**.31**	**.58**
Error	591.48	92	10.38		
Total	34678.00	95			
Corrected Total	596.33	94			

a. R Squared = .01 (Adjusted R Squared = -.027)

* denotes F is significant at 0.05 alpha level.

Table 4 showed ANCOVA test of male and female students' achievement scores in experimental method. The table revealed that F 1, 94 = .31 and p = 0.58 for gender. The significant p-value was greater than the set significant value for the study (p > 0.05). Therefore, the null hypothesis that there is no significant difference in the mean achievement scores of male and female students exposed to computer animation instructional package was accepted. The conclusion drawn was that there was no statistical significant difference in the achievement of male and female students taught CRS using computer animation instructional package.

Data for Hypothesis 3 is contained in Table 3

Hypothesis 3: There is no interaction effect of teaching method and gender on academic achievement of students in CRS.

The focus of Hypothesis 3 was to determine if there was significant interaction effect of teaching method and gender on the mean achievement scores of secondary school students in CRS. From Table 3, it can be seen that at 0.05 level of significance, 1df numerator and 185 df denominator, the calculated F is .597 with P-value of 0.442 which is greater than 0.05. Therefore, the null hypothesis three is not rejected. Thus, there is no significant interaction between teaching method and gender on the academic achievement of secondary school students in CRS.

Discussion of Findings

The finding from Table 1 showed that students in the experimental group (computer animation instructional package) had a higher mean achievement score of (23.83) in CRSAT than their counterparts (18.48) in the control group. This result is further confirmed by the finding from Table 3 which indicates that the computer animation instructional package is a significant factor in the achievement of CRS students. This indicates that students taught using computer animation instructional package achieved better than those taught by lecture method. The result of this study is in

agreement with the findings of Athanassios and Vasilis (2011); Chang, Quintana and Krajcik (2010); Akpinar and Ergin (2018); Falode, et al (2016); Akinbaewa and Sofowara (2020) who found and reported that there was significant difference in the performance of students taught by computer animation instructional package and conventional lecture method. Contrary to the above finding, the result is in contrast to the previous finding of Bulut, Ercan and Bilen (2013) who could not find any significant difference between the students exposed to computer animation instructional package and those exposed to lecture method. Findings from research question 2 in Table 2 shows that the computer animation instructional package was not bias in gender difference as both male and female students had almost the same academic achievement in CRS. The reason for the enhanced achievement of the computer animation instructional package could be that the students were stimulated to learn by the use of computer-aided instruction which spawns interest, excitement, total involvement in teaching and learning process, and encourage students to work at their own pace.

The result of this study supported the earlier finding of Bamidele and Yoade (2017) who found that the performance of students exposed to computer animation instructional package either individually or cooperatively were better than their counterparts exposed to the conventional classroom instruction. However, the researchers found no significant difference in the performance of male and female students exposed to computer animation package. This is also in consonance with the findings of Amal and Sakar (2018); and Akinbadewa and Sofowora (2020) who found no significance difference in the performance of male and female exposed to computer animation instructional package. This was buttressed with the finding from Table 4 which showed that there is no significant difference in the mean achievement scores of male and female students exposed to the computer animation instructional package.

The finding from table 4 showed that, at 0.05 significant level, F 1, 94 = .307 and p = 0.58 for gender. The significant p-value was greater than the set significant alpha for the study (p> 0.05). Therefore, the null hypothesis that there is no significant difference in the mean achievement scores of male and female students exposed to computer animation instructional package was accepted. It was therefore, concluded that there is no gender imbalance in students' achievement when using computer animation instructional package in lesson delivery.

Conclusion

Based on the findings of this research, it was concluded that computer animated instructional package in CRS enhances achievement of the secondary school students. Computer animated instructional package did not favour one gender more than the other in terms of achievement in CRS. The male and female students in the

experimental group had no significant difference in their achievement tests. This means that the achievement of CRS students did not depend on gender but on teaching strategy used by the teacher. From the foregoing, computer animated instructional package may be a valuable tool for enhancing individualized instruction, achievement and learning motivation.

Recommendations

On the basis of findings from this study, it was recommended that:

1. Christian Religious Studies teachers should be encouraged to adopt the use of computer animation instructional package (CAIP) in teaching of students so as to make them achieve better in the subject.
2. Government, Non-Governmental Organizations and Parents Teachers Associations should fund development of computer animation instructional package in the schools, equip the schools with necessary ICT facilities and train manpower to produce software for CRS teaching in Nigerian schools.

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