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EFFECT OF COMPUTER ANIMATION INSTRUCTIONAL PACKAGE ON SECONDARY SCHOOL STUDENTS' INTEREST 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 and lack of interest by students. Teachers are faced with the need to look out for innovative instructional package that could enhance learning, in order to improve students' interest. This study investigated the effect of computer animation instructional package on secondary school students' interest 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 improved interest 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 interest 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 so as to achieve improved interest.

Keywords: Education, Computer animation instructional package, Students, and Interest

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, interest 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' performance in CRS. The WAEC Chief Examiner's Report of 2022 in CRS for Delta State revealed poor academic performance 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' interest 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. 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, 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 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 and have an enhanced interest. When students are successful in CRS examination, they will have the feeling of pride that they made success with their own effort and skills. Such feeling of pride arouses and sustains their interest in learning, with a view that greater improvement would give them greater satisfaction.

When thinking of positive changes in education, it is important to think of things like interest as a boaster to students' achievement. Interest is the ability of an individual to show positive attitude towards

an object, situation or value. Nwoye in Chikwendu and Okoli (2020) described interest as an internal state that influences individual's personal behaviour. The behaviour could be positive or negative. Okeke (2016) stated that in psychological and educational measurement, interest is seen as a motivational construct. Chikwendu and Okoli (2020) opined that interest is a response of liking or disliking of an activity. There is need therefore to foster students' interest in learning CRS using appropriate instructional strategies and materials so as to enhance the achievement of students in CRS in both internal and external examinations. Interest is a feeling of like or dislike towards an activity (Okigbo and Okeke, 2011). Interest is concerned with choice or preference for a particular type of activity to the other. According to Mbaegbu, et al (2023), interest in an activity is sustained depending on what the individual whose interest is engaged stand to gain or lose by so doing. When students develop interest in CRS, they will spend their free time studying the subject. Students' joy in studying CRS will eventually lead them to success in the subject. In this study, the researcher defined interest as the eagerness of an individual to willingly take up a task or participate in a function with ease which could lead to positive innovation in learning and improve academic achievement. To arouse and sustain students' interest in CRS, the teaching and learning methods must be such that appeals to the many senses of the learner. It must engage the students actively and make them take responsibility for their own learning. Such learning and teaching strategy should also meet the various learning needs manifested by the learner with the aid of electronic instructional delivery package.

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. Interest 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' interest 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, Godpower-Echie and Ihenko (2017) 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, Andor, Aneshie-Otakpa, Akobi, Agah, Okeke, Ube, and Iroanusi (2021), reported that gender has no significant effect in the mean scores of students taught using video-aided instruction. On the contrary, Sakiyo, Musa and Waziri (2018) reported that there was significant difference in the interest 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 interest among students. Moreover, no studies have been carried out on the effects of computer animation instructional package on students' interest 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' interest 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 interest of students in CRS in Delta State of Nigeria.

Statement of the Problem

Students achieve poorly and lack interest 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 lack of interest 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' interest in CRS in Delta State. Hence, the present study investigated the effect of computer animation instructional package on students' interest in CRS in Delta State, Nigeria.

Research Questions

The following research questions guided the study.

1. What are the mean interest 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 interest 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 interest 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 interest 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 interest 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.

Presentation of Results

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

Table 1: Interest 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	23.83	3.18	25.12	2.99	1.29
Conventional Lecture Group	91	18.48	3.14	18.93	4.55	0.45
Mean Difference		5.35		6.19		0.84

Table 1 showed the mean interest and standard deviation of students' scores in experimental group and control group. The table revealed that the posttest mean interest score of students in experimental group was 23.83 with a standard deviation of 3.18 while the students in the control group had mean interest score of 18.48 and a standard deviation of 3.14. The mean difference between the two groups was 5.35 which suggest that the groups were of different cognitive interest at the posttest since the mean difference was considered high. Table 1 equally revealed that the posttest mean interest score of students in experimental group was 25.12 and a standard deviation of 2.99 with a mean gain of 1.29 while students in the control group had mean interest score of 18.93 and a standard deviation of 4.55 with a mean interest gain of 0.45. The mean difference between the two groups was 6.19 in favour of the experimental method. The difference at the posttest was higher than that of the pretest suggesting that the students in

the experimental group had interest better than those in the control group. The result from Table 6 revealed that the students in the experimental group had higher mean interest score in CRS. The implication of this result is that the computer animation instructional package employed in the experimental group encouraged the students to assimilate and have interest in CRS concepts learnt easily.

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

Table 2: Interest 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	24.07	3.03	25.43	2.40	1.36
Female	50	23.60	3.36	24.80	3.49	1.20
Mean Difference		0.47		0.63		0.16

Table 2 showed the mean and standard deviation of male and female students' scores in experimental group. The table revealed that the posttest mean interest score of male students in experimental group was 24.07 with a standard deviation of 3.03 while female students had mean score of 23.60 and a standard deviation of 3.36. The Table 2 also revealed that the posttest mean interest score of male students was 25.43 with a standard deviation of 2.40 while female students had mean score of 24.80 with a standard deviation of 3.49. The mean difference was 0.63 in favour of male students which was considered non-significant because the use of computer animation instructional package motivated both sexes to have interest in the learnt concepts of CRS.

Hypotheses

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

Table 3: ANCOVA on the Interest 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	1320.62[a]	2	660.31	49.07	.00
Intercept	497.22	1	497.22	36.95	.00
Pretest	173.61	1	173.61	12.90	.00
Method	295.74	1	295.74	21.98	.00
Gender	733.571	1	733.571	5.325	.023
Method * Gender	**1456.846**	**1**	**1456.846**	**10.576**	**.002**
Error	15841.377	227	137.751		
Total	294304.000	186			
Corrected Total	26963.200	185			

a. R Squared = .46 (Adjusted R Squared = .45); * denotes F is significant at 0.05 alpha level.

Table 3 showed ANCOVA test of students' interest scores in experimental and lecture methods. Pretest scores were used as covariate to control initial difference in the two groups. Results from the Table 3 revealed that F 1,185 = 21.98 and p = 0.00. Since p < 0.05, the observed difference in students' mean interest score in experimental and lecture methods was judged to be significant. Thus, the null hypothesis that there is no significant difference in the mean interest scores of students taught using computer animation instructional strategy and those taught with lecture method was rejected. Students in the experimental group had better interest than their control group counterparts because the use of computer animation package motivated them to assimilate and have interest in the learnt concepts of CRS.

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

Table 4: ANCOVA Test of Male and Female Students' Interest Scores Exposed to Computer Animation Instructional Package

Source	SS	df	Mean Square	F	Sig.
Corrected Model	12.65[a]	2	6.32	.69	.50
Intercept	523.95	1	523.95	57.93	.00
Pretest	6.64	1	6.67	.73	.39
Gender	**5.09**	**1**	**5.09**	**.56**	**.46**
Error	515.53	92	.04		
Total	38379.00	95			
Corrected Total	528.18	94			

a. R Squared = .02 (Adjusted R Squared = -.01); * denotes F is significant at 0.05 alpha level.

Table 4 is an ANCOVA test of male and female students' scores exposed to computer animation instructional package. Table 4 revealed that F 1, = 0.56 for gender with p = 0.46. Thus, p > 0.05. This showed that gender has no significant effect on mean interest scores of CRS students exposed to computer animation instructional package since p–value was greater than 0.05 level of significance. Since p > 0.05, the null hypothesis that there is no significant difference between the mean interest scores of male and female students in CRS exposed to computer animation instructional package was therefore accepted.

Hypothesis 6: There is no significant difference in the mean interaction effect of teaching method and gender on interest of students in CRS.

The focus of Hypothesis 3 was to determine if there was significant interaction of teaching method and gender on the mean interest 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 10.576 with P-value of .002 which is less than 0.05. Therefore, the null hypothesis three is rejected. Thus, there is a significant interaction between teaching method and gender on the interest of secondary school students in CRS.

Discussion of Findings

Result from Table 1 revealed that the students exposed to computer animation instructional package, had better interest in CRS concepts than those in control group. This was shown by mean interest score of 25.12 for experimental group which was higher than that of 18.93 for control group. Table 2 also revealed that mean interest scores of the male students in experimental group (25.43) was almost the same with the female counterparts (24.80) exposed to computer animation instructional package. Thus, it was concluded that there was no significant statistical difference in the mean interest scores of male and female students exposed to computer animation instructional package in CRS. Computer animation instructional package did not favour one gender more than the other. The result of this study is in agreement with that of Adedeji, Adeyinka and Olufemi (2015) which showed that the performance of students in Biology did not depend on gender. It was therefore concluded that the students' interest of the learnt concepts does not depend on gender but on the interest of the students and teaching method adopted by the teachers.

The results from table 2 and 3 showed that students performed extremely well in interest test. This indicates that the use of computer animation instructional package enabled the students to really understand the concept and thus, rote learning is discouraged. Hence, use of computer animation instructional package which enhanced students' better interest of the

concepts. The ANCOVA test in Table 3 also indicated that the computer animation instructional package is a significant factor in students' interest in CRS. This was shown by the rejection of the null hypothesis that there is no significant difference between the mean interest scores of students exposed to computer animation instructional package and conventional lecture method. It seems that computer animation instructional package is one of the valuable packages for impacting CRS concepts to the students in Nigerian secondary schools. This was shown by the comparison of mean interest score of the experimental group with control group. There was significant difference between the interest scores of student taught CRS by computer animation instructional package and those taught by convention method. The result is in agreement with the findings of Giginna (2013); Chikwendu (2018) and Akpinar and Ergin (2017) who found significant difference in the interest scores of students taught with computer animation instructional package and conventional lecture method. The results are in compliance with that of Falode, et al. (2016) which earlier showed that computer animation instructional package can sustain students' interest, encourage them to participate actively in the lesson and help them retain the learnt concepts for a long time. Computer animation instructional package that utilizes the principles of explanation and seeing on the screen to encourage and elicit good responses from the students may promote meaningful learning, achievement and interest in CRS.

The result of the analysis from table 4 also showed that there was no significant difference in the interest scores of male and female students. At 0.05 significant level, the table revealed that F 1, 94 = 0.56 for gender with p = 0.46. This showed that gender has no significant effect on mean interest scores of CRS students exposed to computer animation instructional package since p – value is greater than the set alpha of 0.05.

Conclusion

Based on the findings of this research, it was concluded that computer animated instructional package in CRS enhances interest of the secondary school students. Computer animated instructional package did not favour one gender more than the other in terms of interest in CRS. The male and female students in the experimental group had no significant difference in their interest in CRS. This means that the interest 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, interest and learning motivation.

Recommendations

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

1. Schools should train CRS teachers on the use of ICT resources for teaching and learning particularly, the use of different software package, DVDs, CD ROMs, videotapes, overhead projectors on CRS concepts and processes to encourage the potentials of ICT in Nigerian schools.

2. Computer literacy programme should be provided by the government and education stakeholders for both students and teachers for full integration of ICT resources in education programme.

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