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IMPACT OF COMPUTER LITERACY SKILLS OF PUPILS ON LEARNING OUTCOMES IN CRS USING DIGITAL STORYTELLING STRATEGY

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Abstract

This study examined the impact of computer literacy skills of pupils on learning outcomes in Christian Religious Studies (CRS) using Digital Storytelling Strategy (DSS) in some selected primary schools in Lagos State. A quasi experimental pre-test, post-test control group design was adopted for the study using intact class. Two research hypotheses were generated and tested at 0.05 level of significance. The population of the study comprised of 450 pupils from nine public primary schools selected from three Local Education Areas of Lagos State. The data collected were analyzed using Analysis of Covariance (ANCOVA) at 0.05 level of significance. The result obtained showed that the pupils with computer literacy skills were able to use the intervention and had better academic performance in CRS. Pupils exposed to DSS had the highest posttest value mean score of 52.55 above the control group with 35.86. Pupils in DSS had the highest posttest achievement mean score of 25.80. Based on this premise, digital storytelling strategies should be adopted by CRS teachers, particularly for the pupils with low computer literacy skills.

Keywords: Computer Literacy Skills; Digital Storytelling Strategy; Religious Education

1. Introduction

The curriculum for Christian Religious Studies (CRS) and Moral Instruction expect schools to concentrate on their cognitive, moral, character and physical formation of pupils. Religious Education as a school subject, is an important element towards effective laying of a valid and sound foundation for moral consciousness in pupils' in the course of undergoing developmental phases. This will allow for proper dispensation of knowledge acquisition in specific and sensitive areas of character development in pupils in the course of acquiring education. The Nigerian educational sector has a fundamental philosophy which is based on building moral consciousness. Building in children, the right moral behaviour remains a major factor in the achievement of national goals. This is essentially predominant especially at the primary school level, where learners' character is still at the formative stage.

Nigerian Educational Research and Development Council (NERDC, 2013) developed the National Christian Religious Curriculum and stated that CRS remains a subject that is aimed at instilling moral and righteous living in the society. The Federal Republic of Nigeria (2013) reviewed the curriculum of CRS and stated that building human values, moral and attitudes remains its priority. As a result of that review, the major objectives of CRS were highlighted to include:

- i. inculcating in the learner the respect and knowledge of God and respect for humanity and society;
- ii. developing in the learner strong personality and character formation, and deep sense of responsibility to fellow man; iii. sensitising in the learner respect for the rights and privileges of others; iv. Moulding and developing in the life of learners' good attitudes and values like humility, love, justice and forgiveness, obedience, faith, fair play that will guide human interaction and coexistence;
- v. preparing the learner for useful living by helping him/ her to improve his/ her moral values and attitudes to God and fellow man; and
- vi. inculcating in the learner the understanding of the basic teachings of Jesus and to apply them in his/ her daily life and work.

From the objectives above, CRS is meant to develop the learners by exposing them to knowledge and values, helping them to have respect for authorities whether spiritual or temporal, and equipping the learner with the appropriate attitude and moral values required for co-existence with others in any given human environment. This implies that christian attitude drawn from the teachings and life of Jesus as contained in the Bible is detailed enough to deal with the moral formation of a growing child. This is the reason why Eluu (2009) is of the belief that having less knowledge on Religious Studies would lead Nigeria to encounter incessant conflicts like social unrest, religious crisis, insurgencies, increase in criminal activities among others, because the study of religious studies helps regulate human actions and activities, thereby promoting communal co-existence.

Adedeji (2003) and Obemeata (2012) identify religious education as a means to eradicate cultism that is presently ravaging Nigerian schools. Thus, to a great extent, the panacea for moral crises, corruption and crime in Nigeria is the inclusion of CRS in the primary schools' curriculum. Therefore, the study of the subject, is the way to build pupils to have the knowledge of God and to instil in them the ideal or moral way of living as introduced by Jesus. This is in tandem with stated objectives to produce responsible citizens, with laudable values and selfless behaviour to God and to man, whose roles and attitudes are worthy of emulation. This explains why CRS is taught in the nursery and primary schools to impart acceptable moral values into pupils and thereby strengthen community capabilities and Pupils ability to live with the challenges accompanying life tasks.

Christian Religious Studies (CRS) inculcates values and virtues in learners to modify their behaviour and reshape their minds. It was categorised in the Nigerian National Policy on Education as a programme of study in religion and national values, and that was expressed in the primary school curriculum (FRN, 2013). Furthermore, the curriculum listed the goals for teaching CRS in primary schools to include making the children to develop acceptable social and moral norms and values (FRN, 2013). The National Policy on Education further intensified that the moral and value development in Nigerian children would include:

- a. Developing the morality and patriotisms of children; and
- b. Inculcating national consciousness, values and national unity into children (FRN, 2013)

The learning of CRS is an aspect in school programme, which inculcates, the elements of education, intellectual theories and practices of the holiness in Christianity as contained in the Holy Bible. CRS aimed at moulding and developing christian values and attitudes in learners. These attributes inculcated obedience to constituted authority, respect for life, responsible individual, selfless services to God and humanity, which would provide the learner with moral and spiritual transformation (Ali & Akubue in John (2009). Effective teaching and learning techniques would provide opportunities for achieving CRS values.

CRS inculcates values and virtues in learners to modify their behaviour and reshape their minds. The impact of the subject on Nigerian schools to achieve the goal of inculcating positive societal values in pupils seems not to have been achieved. This can be seen from the various reports of crime and corruption in Nigerian newspapers. Oyeleye and Lawal (2012) report cases of indecent dressing among teenagers and youths which lead to sexual harassment. Also, Zakka-Bako (2014) while tracing the development of incidence of youth violence, reports cases of rape, fighting, vandalism and cultism in primary schools. Likewise, Ebong (2015) believes that morality and discipline have been thrown overboard as examination malpractices, gambling, looting and other vices are said to be found among youths. Ebong (2015) explained that hard work, honesty, respect for law and order, truthfulness, integrity, obedience, trustworthiness and faithfulness, love for one another, were positive and right values embedded in CRS. He further reiterated that these values were fast becoming elusive, archaic and unpopular in the school. These suggest that Nigerian youth lack proper moral education right from infancy.

Furthermore, according to Omede and Odiba (2010), issues of moral decadence are being incessantly recorded by schools and authorities. They explained that this is due to the fact that good moral values are not exhibited by majority of the learners at all levels of learning in Nigerian schools. However, with the current CRS teaching and learning in Lagos State schools, those desired outcomes did not manifest in pupils' behaviours judging from the state of observable immorality in schools and the society. This implies that many pupils do not manifest the positive values that depict the knowledge which CRS is meant to inculcate. (Njoku & Njoku, 2014).

As claimed by Lawal (2010), the methodologies in the CRS classroom influence students' ability and development. A study on CRS teaching methodologies shows that interactive methods in Religious Studies help in developing both the academic understanding and moral values in children (Okunade, 2003). Cheben (2002) and Lawal (2010) discover that pupils do not perform well in CRS when teaching approaches were not interactive. In interactive learning, students' participation was activity based; thus, students were encouraged to be responsible for their learning (Deo, 2016). Likewise, Adeyeye (2008) attributed the recurring poor achievements in CRS to ineffective teaching and learning techniques adopted by the teachers of CRS. There were new ways into effective teaching and learning, which were evolved through digital tools that were derived from Information Technologies (ITs) and e-learning. These new ways were interactive in nature and provided opportunities for teachers and students to participate effectively in the teaching and learning process (Kumar & Lightner, 2007). One of the proposed strategies to inculcating the values enumerated above is the digital storytelling strategy. Such values cannot be effectively taught with verbal or lecture method.

In a digital world of today, the activities of humans are relatively more defined and complex. Stories are presented in visuals, images, while some are carved in woods, others in ivory and stones, presented in canvass and most times now stored electronically as digital images. Our curriculum concepts are gradually being transformed into fictions, stories and supported with high level technologies through the use of multimedia tools with built-in learning medium of auditory, visuals and platforms. Through the use of such tools, it makes a story more real, comprehensive and internalised thereby, adding value and content to the teaching. In other words, this act of delivering the content to a heterogeneous group is called digital storytelling. The National Policy on Education (FRN, 2013) sets guidelines for specifications, procedures and activities in the usage of ICT at different levels of learning in school curricular, and these influence the use of Digital Storytelling Strategy (DSS) as necessarily a problem solving specialized ICT-based methodology for learning in schools which is pertinent to encouraging, coordinating and supporting pupils' classroom learning. The DSS is a scientifically systematic methodology for reflective learning among school children, as it helps pupils to use ICT-based technology for interaction and reasoning, and to evaluate information and distinguish facts from fictions.

The modern expression of the ancient art of storytelling is called Digital Storytelling (Hofer & Swan, 2006). The term digital stories as derived from computer technologies, uses both voice and narrative capacities and needs together, as a result giving a deeper dimension and vivid coloration to characters, experiences, insights and situations. This digital storytelling is used in virtually all disciplines ranging from education to entertainment and the definitions and descriptions vary widely. Some researchers (Meadows, 2003 & Robin, 2009) define the term as an act of creating short stories and piece which enhances both learner's information gathering and problem-solving skills, and also facilitate their ability to work as a collaborative team. Lowenthal and Dunlap (2010) and University of Houston (2012) described digital storytelling as a narrative often told in digital format, and that which shares point of view after the tellers' viewpoints, a personalized multimedia tale told from the heart and the act of using computer-based gadgets to present stories.

Digital Storytelling Strategies (DSS) are in various modes: The Instructor or Teacher-led and Student or Learner digital storytelling modes. Instructor or Teacher-led digital storytelling mode is currently the most well-known type of educating learners. It is a style of guidance that is formal, controlled and despotic in nature, where the teacher coordinates how, what and when students learn through digital storytelling. It allows teachers to guide, support and gradually prompt learners as they compile and build knowledge through digital storytelling. Learners are also assigned responsibility to as much as each learner can effectively take. On the other hand, in a Learner-led digital storytelling classroom, learners are actively learning, and they have greater input into what they learn, how they learn it and when they learn it. Learners take responsibility of their own learning and are directly involved in the learning process. Learner-centered mode of digital storytelling is the perspective which focuses on the learners' experiences, perspectives, backgrounds, talents, interests, capacities and needs. Learners take ownership of their own learning, contribute to the design of curriculum, and take responsibility for some levels of instruction.

The open doors in the utilization of computerized narrating innovations in improving learning results illuminate the requirement for an exploration regarding this nature which examines the utilization of advanced narrating advances and how it will improve learning results in CRS in Nigerian elementary schools. The current trend in use of computer-based technology is continuously on an overwhelming increase. The application of technology in education has subdued many pedagogical challenges confronting teachers in teaching and learning processes (Greenhow, Robelia & Hughes, 2009). The paradigm shift in classroom

practices is about gradually disengaging teachers from their traditional beliefs and roles as instructional authorities, and as conveyors of knowledge, information, ideas and skills. The emphasis in this study reflects on the use of technology in CRS teaching and learning, and concentrates on the digital storytelling strategies. These are efforts in the search for learning strategies that will potentially encourage interactive learning, which will make children to become independent in decision-making. Basically, the use of technology would promote primary school pupils' use of societal acceptable values and morals as well as improving the knowledge and learning of CRS.

However, computer literacy influences students' performance positively. It makes it possible for students to accommodate information, increase motivation and enable learners to make corrections. Studies have shown that learners' engagement is paramount to learning success (Herrington, 2003). Meaningful integration of technology is achieved when students are able to use computer tools to obtain information in a timely manner, analyse and synthesize the information and present them properly (Harris, 2005). This forms the basis for the inclusion of digital storytelling approaches in CRS teaching and learning. Technology Integration enhances student's learning and educational learning and educational institutions desire this expectation but, the teachers need to be trained to understand both technical and pedagogical issues in the use of technologies. Teachers are not to be limited to the use of computer technology or understanding a computer tool. It requires knowledge of the learner, the content to be learned, as well as an understanding of how computer tools can be used to help the learners accomplish learning goals. Human beings use tools to make lives better. In education, technologies are used in teaching and learning process. In the use of these technologies in classroom, many teachers are not effective enough. This according to Hsu (2010) may be due to teachers not receiving sufficient instruction or practice in the integration of learning technologies into their lessons. Leu (2000) sum up the situations by stating that teacher familiarity, confidence and skill in choosing software and integrating technology are dependent on teacher training and time for self-directed exploration and learning. Due to relative newness of computer technology, many teachers have not received adequate training to select appropriate technology and lack support to use them.

2. Statement of the problem

Christian Religious Studies (CRS) is included in primary school curriculum to expose pupils to moral instructions capable of developing positive values and attitudes. However, there is still the prevalence of social vices, immoral and anti-social behaviors that call to question the effectiveness of the methods of teaching and learning of CRS. Previous studies focus largely on strategies of teaching CRS in schools, such as conventional teacher-centered methodologies as they affect pupils' attitude, interest, participation and learning outcomes. Therefore, this study was carried out to determine the impact of computer literacy skills of pupils on learning outcomes in CRS using Digital Storytelling Strategies (DSS) in Lagos State. The moderating effect of computer literacy skill and gender were also examined.

2.1 Hypotheses

H01: There is no significant main effect of treatment on pupils' achievement in Christian Religious Studies.

H02: There is no significant interaction effect of treatment and computer literacy skills on pupils' achievement in CRS.

3. Methodology

This study adopted a pretest-posttest control group quasi experimental research design. The study involved an intervention into the teaching of CRS with the use of digital storytelling strategy and skills. There were experimental groups (teacher-led and pupils-led groups) and the control-group, such that both (experimental and control) groups were statistically comparable. The target population of the study consisted of all primary six (6) pupils that offered CRS in the selected nine public primary schools from three Local Government Area of Lagos State. The distribution of participating pupils in the selected schools into control and experimental groups were made using simple random sampling through ballot. The total number of primary six pupils that participated in the research was 450 and nine CRS teachers. The instruments used for data collection were Teachers' instructional guides, Pupils Achievement Test (PAT) on CRS/Moral Instruction and Pupils Computer Literacy Questionnaire which were developed for the study on a 3-point scale Likert type. The reliability value of Pupils achievement test in CRS was 0.82 and Pupils' Computer Literacy level questionnaire was 0.74. The researcher visited the selected schools to request for approval and cooperation of headmasters and CRS teachers. The researcher as well visited designated government computer centers (in the three Local Education District of Educational District VI and request for the cooperation and support of the facilitators. The following time schedule were used for the study:

- a. The first two weeks was used for the training of research assistants
- b. One week for pre-test administration
- c. Six weeks for the treatment of the two experimental groups with the use of digital storytelling strategy while control group was not subjected to any treatment at all
- d. One week for post-test administration; and
- e. A total of eleven (11) weeks was used to collect data as explained above

The data collected were analyzed using Analysis of Covariance (ANCOVA) of the pretest scores as covariates. The Estimated Marginal Means (EMM) was used to determine the magnitude of performances at the posttest level. The Bonferroni Post-hoc Analysis was carried out to explain the sources and contributory variables responsible for the significant main effect in the study. At the same time, line graph was used to disentangle the significant interaction effects. All the hypotheses were tested at 0.05 level of significance.

4.0 Results

H01: There is no significant main effect of treatment on pupils' achievement in Christian Religious Studies
Table 1: Summary of Analysis of Covariance (ANCOVA) on Achievement

Source	Type iii sum of squares	Df	Mean square	Sig.	F	Partial eta squared
Corrected model	343.949 ^a	18	19.108	2.940	0.000	0.109
Intercept	35458.466	1	35458.466	5456.236	0.000	0.927
Pre-achievement	9.026	1	9.026	1.389	0.239	0.003
Treatment	197.083	2	98.541	15.163	0.000*	0.066

Computer literacy	8.594	2	4.297	0.661	0.517	0.003
Gender	.577	1	0.577	0.089	0.766	0.000
Treatment x Computer literacy	14.096	4	3.524	0.542	0.705	0.005
Treatment x Gender	1.156	2	0.578	0.089	0.915	0.000
Computer literacy x Gender	8.549	2	4.274	0.658	0.519	0.003
Treatment x Computer literacy x Gender	18.425	4	4.606	0.709	0.586	0.007
Error	2800.942	431	6.499			
Total	284745.000	450				
Corrected total	3144.891	449				
R squared = .109 (adjusted r squared = .072)						

Table 1 revealed that there was a significant main effect of treatment on pupils' achievement in Christian Religious Studies ($F(2,431) = 15.16$; $p < 0.05$, partial $\eta^2 = 0.07$). The effect is 7.0%. This indicated 7.0% variation in pupils' achievement in Christian Religious Studies was account for by the treatment. Thus, hypothesis one was rejected. In order to determine the magnitude of the significant main effect across treatment groups, the estimated marginal means of the treatment groups were carried out and the result is presented in table 2

Table 2: Estimated Marginal Means for Post-achievement by treatment and control group

Treatment	Mean	Std. Error
Teacher-led Digital Storytelling Strategy (TDSS)	25.22	0.226
Pupil-led Digital Storytelling Strategy (PDSS)	25.80	0.248
Conventional Strategy (CS)	23.84	0.258

Table 2 revealed that pupils exposed to Pupil-led Digital Storytelling Strategy (PDSS) had the highest adjusted post-achievement mean score in Christian Religious Studies (25.80), followed by pupils exposed to Teacher-led Digital Storytelling Strategy (TDSS) (25.22), while those exposed to the conventional strategy (cs) had the lowest adjusted post-achievement mean score in Christian Religious Studies (23.84). This order can be represented as PDSS > TDSS > CS.

Table 3: Bonferroni Post-hoc Analysis of Post-achievement by Treatment and Control group

Treatment	Mean	TLDSS	PLDSS	CS
Teacher Led Digital Storytelling Strategy (TLDSS)	25.22			*

Pupil Led Digital Storytelling Strategy (PLDSS)	25.80		*
Conventional Strategy (CS)	23.84	*	*

Table 3 revealed that pupils exposed to Pupil-led Digital Storytelling Strategy (PDSS) were not significantly different from their counterparts taught using Teacher-led Digital Storytelling Strategy (TDSS) but significantly different from those exposed to the Conventional Strategy (CS) in their Post-achievement mean scores in Christian Religious Studies. Furthermore, pupils taught using Teacher-led Digital Storytelling Strategy were significantly different from those exposed to Conventional Strategy. This implies that the significant difference reveals by the ANCOVA was a result of difference between the treatment (Teacherled and Pupil-led Digital Storytelling Strategies) and the control group but not between the two treatment groups as far as achievement in Christian Religious Studies is concerned.

Ho2: There is no significant interaction effect of treatment and computer literacy skills on pupils' achievement in CRS.

Table 1: Summary of Analysis of Covariance (ANCOVA) on Treatment and Computer Literacy

Source	Type iii sum of squares	Df	Mean square	F	Partial eta squared
Corrected model	343.949 ^a	18	19.108	2.940	0.109
Intercept	35458.466	1	35458.466	5456.236	0.927
Pre-achievement	9.026	1	9.026	1.389	0.239
Treatment	197.083	2	98.541	15.163	0.000
Computer literacy	8.594	2	4.297	0.661	0.517
Gender	.577	1	0.577	0.089	0.766
Treatment x Computer literacy	14.096	4	3.524	0.542	0.705*
Treatment x Gender	1.156	2	0.578	0.089	0.915
Computer literacy x Gender	8.549	2	4.274	0.658	0.519
Treatment x Computer literacy x Gender	18.425	4	4.606	0.709	0.586
Error	2800.942	431	6.499		
Total	284745.000	450			
Corrected total	3144.891	449			
R squared = .109 (adjusted r squared = .072)					

Table 2 revealed that there was no significant interaction effect of treatment and computer literacy on pupils' achievement in Christian Religious Studies ($F(2,431) = 0.54$; $p > 0.05$, partial $\eta^2 = 0.00$). The effect is 0.0%. This indicated no variation in pupils' achievement in Christian Religious Studies was account for by the treatment and computer literacy. Thus, hypothesis two was not rejected which signifies that there is no significant interaction effect of treatment and computer literacy skills on pupils' achievement in CRS 4.1

Discussion of findings

The result revealed there was a significant main effect of treatment on pupils' achievement in Christian Religious Studies. It shows that participants taught with the pupil-led digital storytelling strategy had highest achievement scores, followed by the teacher-led digital storytelling and conventional strategies respectively. The effectiveness of the experimental strategies (pupil and teacher led digital storytelling strategies) may be due to the fact that they allow pupils to enhance their information gathering and problem-solving skills, and to facilitate their ability to work in a collaborative team (Meadows, 2003 & Robin, 2009). It may also due to the fact that it creates a learning environment conducive to learning and promotes the highest levels of motivation, learning and achievement for all learners (Mccombs & Whisler, 1997).

The efficacy of Pupil-led digital storytelling strategy over both the Teacher-led digital storytelling and Conventional strategies may be unconnected with the fact that the strategy allowed active learning whereby pupils have greater input into what they learn, how they learn it, and when they learn it. The efficacy of Pupil-led digital storytelling gives credence to the Piagetian cognitive theory that the developing child builds cognitive structures (mental maps) for understanding and responding to physical experiences within their environment and this may result in pupils' improved achievement. The result supported the findings of Smeda, Dakich and Sharda (2014) that digital storytelling strategy increases students' communication abilities, which results from cooperation and collaboration between groups, different groups, and in helping each other with technical or grammar issues.

The findings also showed that teacher led digital storytelling strategy were more effective than conventional strategy. This may be due to the fact that it allows teachers to guide, support and gradually prompt learners as they compile and build knowledge through digital storytelling. Learners are also assigned responsibility to as much as each learner can effectively take. The result of the effectiveness of Teacher-led digital storytelling strategy over the conventional strategy supported the findings of Kaplan and Owings (2001) that teachers who learn and practice sound pedagogical practice techniques can affect students' measured achievements and that students whose teachers have strong content knowledge and have learned to work with students who come from different cultures or have special needs perform better than their peers while learning with digital storytelling.

Moreover, computer literacy and treatment were found to have no significant interactive effect on pupils' achievement in Christian Religious Studies. Low computer literacy pupils had better achievement gain than their high and medium counterparts, but this difference was not statistically significant. Medium computer literacy pupils had better achievement gain than their low and high counterparts, but this difference was not statistically significant. The findings disagreed with Roschelle, et al (2000) that computer technology in the classroom, supports learning and helps develop critical thinking, analysis, and scientific inquiry.

5. Conclusion

This study examined the effects of Teacher-led and Pupil-led digital storytelling strategies and primary school pupils learning outcomes in Christian Religious Studies in Lagos State, Nigeria. The moderating effects of computer literacy was also examined. The findings of the study revealed that pupils from Pupilled digital storytelling strategy had the better post-achievement score in Christian Religious Studies. There were no significant interaction effects of treatment and computer literacy on pupils' achievement in Christian Religious Studies.

6. Recommendations

In view of the findings of this study, the following recommendations were made

- i. Teachers should adopt Teacher-led and Pupil-led digital storytelling strategies in the teaching of Christian Religious Studies concepts in order to enhance pupils' achievement.
- ii. Teachers should facilitate the use of Teacher-led and Pupil-led digital storytelling strategies in schools to improve pupils' acquisition of important values in the subject that are germane for peaceful coexistence.
- iii. Teacher led digital storytelling strategy is recommended for the teaching of Christian Religious Studies for the achievement gains in Christian Religious Studies since it favours low computer literacy pupils
- iv. Government should organize a form of re-training programme for the in-service and pre-service teachers in the effective use of Teacher-led and Pupil-led digital storytelling strategies through organization of seminars, workshops, and conferences for CRS teacher at primary school level.

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