EFFECT OF 3D COMPUTER ANIMATION ON LOWER PRIMARY PUPILS MOTIVATION TO LEARN CULTURE

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Abstract

Yoruba culture is fast losing its holds as younger generation seems to less concern about Yoruba cultural activities. There is urgent need to salvage the situation right from primary school. Thus there is need for teachers to use instruction that can further motivate pupils towards learning about the culture. One of the instruction capable of motivating pupils at primary school level is 3D computer animation instruction. The study investigated the effect of 3D animation on lower primary school pupils motivation to learn culture.

The study adopted the pre-test,post-test control group quasi experimental design. Sample comprised of 57 pupils selected from two intact classes. The Pupils Motivation Questionnaire was used for data collection. The two groups were randomized into experimental and control group The questionnaire was used as pre-test and post-test while data was analysed using Analysis of covariance (ANCOVA)

The result showed that 3D computer animation has significantly improved motivation of lower primary school pupils ($F_{(1,56)}$ =18.319, $p < 0.05$). It also showed that gender has no significant effect on lower primary school pupils to motivation to study Yoruba culture ($F_{(1,56)} = 1.450$, $p > 0.05$). It was also found that there is no interaction effect of 3D computer animation instruction and treatment on lower primary school pupils to motivation to study Yoruba culture ($F_{(1,56)} = .072$, $p > 0.05$)

The study concluded that 3D computer animation instruction has effect on improving pupils motivation towards learning cultural aspect of Yoruba while it is recommended that primary school teachers Yoruba teachers should adopt the 3D computer animation instruction to motivate pupils to learn Yoruba culture

Keywords: 3D animation, Motivation, Pupils, Yoruba

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Introduction

Primary education is the foundation of any education. It serve as the bases on which other levels of education is built, if well laid, there is every chances that all other levels of education will be successful. To build a solid foundation in education at any level, the adoption of technology in education has become eminent. The adoption of technology supporting role in education has the ability to change how students learn. It adoption has a lot of benefits in terms of instructional methodology or delivery method in providing an effective learning environment for young children (Husain, 2010). Adoption of technology in education brings about effectiveness and effective learning utilizes teaching tools that help students eliminate distractions, boost focus, help concentration and increase productivity levels in their learning process. This is supported by Gilakjani (2012), who reported that effective learning is motivated by the importance and value of the information presented in the learning environment.

In Nigeria, there are various ethnic groups, each having its own peculiar language and dialects being spoken in different communities (Akinkurolere and Adewumi, 2013). The Yoruba ethnic group makes up about 30% of the population of Nigeria, making them the second biggest ethnic group, among the three major groups while other ethnic groups have minority status. The National Policy on Education recommended that teaching and learning of Yoruba language in schools must start right from primary school level and continues to secondary school level. As a result of this, Yoruba language have for a long time been a subject in secondary school curriculum both in public and private schools especially in the South West of Nigeria. (Olatunji, 2017).

Despite the international recognition of Yoruba language and its culture **i**t is disappointing that Yoruba culture (beliefs, ideologies, customs and norms) is deteriorating in recent times (Balogun, 2013). Cultures such as greetings (kneeling down and prostrating for elders), chastity (virginity), dressing (traditional attires such as Aso Oke, Dansiki and others), moonlight folktales and traditional hairstyles for females are now considered outdated (Akinkurolere & Akinfenwa 2018). However, there are reasons for the decline and endangerment of Yoruba language, which are both remote and immediate causes responsible for the threat of serious endangerment staring the Yorùbá language in the face (Fabunmi and Salawu 2005). Udoji (1974) white paper report recommended that one of the three main native languages in Nigeria should be used as a medium of instruction in all academic environments in Nigeria to enhance learning (Olaopa, 2013).It is common knowledge that younger generation now finds it difficult to speak Yoruba fluently while other are simply ashamed to do so. This is as a result of their poor attitude which extends to the reading of Yoruba literary text which would have improved their level of proficiency in Yoruba language.

Also, Akinkotun et al, (2022) confirmed that the Yoruba language is not being used as a mode of teaching and learning in most primary schools in Yoruba speaking states. Thus pupils are not motivated to learn Yoruba culture. Meanwhile, highly motivated students appear to put in more learning work, perseverance, and success in classroom practices and assignments than low motivated students (Wolters & Rosenthal, 2000; Yustina et al., 2020). Hence, there is need for more captivating strategy that will boost students motivation to learn Yoruba culture primary level. It is therefore imperative that students are sufficiently motivated to study which means increasing students' interest in the topics taught, along with overcoming challenging concept (Milada et al. 2022). Hendajauni et al. (2018) observed that it is difficult for elementary school

students to comprehend what is taught to them in school and suggested they need method that will keep them engaged. To this extent, Ahmed (2021) encouraged educators at all levels to use active learning strategies so that the students are more interested in classroom learning.

The need for means of improving students motivation to learn led to the introduction of the use of IT in education. Popular nowadays is multimedia technology that incorporates various media such as text, graphics, animation, video and computer-controlled audio. Various elements of multimedia can be developed to improve the quality of education (Ismail et al, 2017). When the teaching content focuses more on the theory, this can create low motivation and low achievement in students' learning (Widodo, 2017).

Animation is one of the elements of multimedia that is also applied in the teaching and learning process as it can bring a human fantasy to the real world. Animation refers to computerized simulation by processes using image to form a synthetic motional picture. It is a process of putting still images together in a sequence or manner they will appear one after the other creating an illusion movement. (Zahra, 2016). Animation helps learners to visualize a dynamic process which otherwise may be difficult to visualize. Computer animation is created through 3D computer graphics, although 2D computer graphics are still widely used for low bandwidth and faster real-time rendering requirements. Animation, which is essentially a visual presentation, has become the most prominent feature of the technology-based learning environment. It refers to a simulated motion picture that shows the movement of a drawn object (Noor, 2020). To date, computer animation in education has become one of the most powerful tools for presenting multimedia materials for students, and its importance in helping to understand and remember information has increased since the advent of compelling graph-oriented computers (2013). Besides, the animation plays a vital role as an exciting learning medium. This is because the visual form of the mobile is accompanied by audio that can be used to explain the content of the lesson that is difficult to convey. Efforts to facilitate the introduction of alphabets in interest then designed an interactive alphabetical introduction for students (Supriyono, 2018). 3D animation technique are employed to attain a level of sophistication through which a strong message and lesson on education can be portrayed. Cakiroshu and Yihnaz (2017) state that 3D animation can facilitate learning with 3D objects and allow students to investigate animation videos in event object or concepts more accurately. Visual aids can help students understand particularly difficult and abstract topics (Bunce & Gabel, 2002; Harrison & Treagust, 2006) by stimulating their imagination and enhancing their ability to understand the subject matter, thereby improving the memorization of these concepts. Visualization can also enable students to adequately understand preconcepts (Tarmizi, 2010) while preventing the formation of misconcepts.

Animation-based teaching is effective in describing processes that change over time and space (Ainsworth & VanLabeke, 2004; Schnotz & Lowe, 2003). Dynamic visualization is especially suitable for dynamically visualizing abstract objects which students cannot easily imagine. Therefore, teaching through dynamic visualization is significantly more effective, especially in difcult scientifc disciplines in which dynamic visualization can support the students' cognitive processes (Bilbokaite, 2015; McElhaney et al., 2015). Authors like Sarboch et al., (2019) claim concluded that using the animations during educational process have positive effect of while others are not clear in their conclusions (Boucheix & Schneider, 2009; Bulman & Fairlie, 2016). In the meta-analysis by Castro-Alonso et al. (2019), the influence of the subject on the effectiveness of dynamic visualization (animation) in teaching was also investigated. The authors

focused on STEM and found that the dynamic type of visualization is more effective in geology and other sciences (g=0.38; 11 comparisons) and subsequently in biology and medical sciences (g=0.27; 11 comparisons) than in technical or mathematical subjects (g=0.15; 15 comparisons) or even physics and chemistry (g=0.19; 23 comparisons). Nevertheless, the number of overall comparisons was relatively low, which reduces the statistical power of the results.

Chiou et al. (2015) conducted an experimental study and found that instructional material enriched with animation together with multi-dimensional concept maps was better than multi-dimensional concept maps alone with respect to students' achievement, satisfaction, and retention. In the study of Luzón and Letón (2015), they suggest that the use of animation in instructional materials facilitates the cognitive processes, such as in selecting information, thus it promotes the students' learning ability. In another study, Daşdemir and Doymuş (2016) examined the effect of animation-based teaching materials on academic achievement, retention in achievement, and the scientific process skills development of students in science and technology lessons; it was found that these materials had a positive effect on these constructs. In a study in which student views on the use of animation in science lessons were examined, a positive and moderate relationship was found between students' use of animation and their attitude towards technology (Önal & Söndür, 2017). Also, in the study conducted by Rosen (2009), it was reported that animation-based content significantly and positively affects students' knowledge transfer and motivation towards science and technology lessons.

Hamzat et al. (2017) in his study also shows that animation can increase student achievement in practical work. Students were exposed to computer-based learning using animation methods for Biology. Students can learn skills through the exciting animated display. The results also showed no differences in gender outcomes. The use of said animation tools is gender-friendly. The success of learning occurs when students can use the senses in interaction and provide a response to the submission of a teacher.

The meta-analysis conducted by Berney and Bétrancourt (2016) also examined the influence of moderating variables that affect the effectiveness of animations in the teaching process. Tis meta-analysis among other things showed the subject in which the analysis is performed is a determinant of effect size as well. The highest effect was measured in "natural sciences" (g=1.26; 8 comparisons), with a relatively large effect in chemistry as well (g=0.77; 8 comparisons), but with a low effect size in biology (g=0.20; 33 comparisons). However, even in these results, only a few subjects were compared, which reduced the statistical power of the results.

The effect of gender on students motivation and academic remains contestable. Most of the previous researchers found that female students are more motivated towards the achievement of desirable learning goals as compared to male students (Naz et al 2020). Also Narayanan et al (2007) found that in learning English, girls have greater intrinsic motivation compared to boys. These findings also get support from the findings of Nadia (2010) and Mubeen et al, (2013) who found females as more intrinsically motivated and males as more extrinsically motivated.

The objective of this study was to investigate the effect of 3D animation on lower primary school pupils motivation to learn culture.

Research Question

1. Which gender will return higher motivation after exposure to 3D animation

Statement of Hypotheses

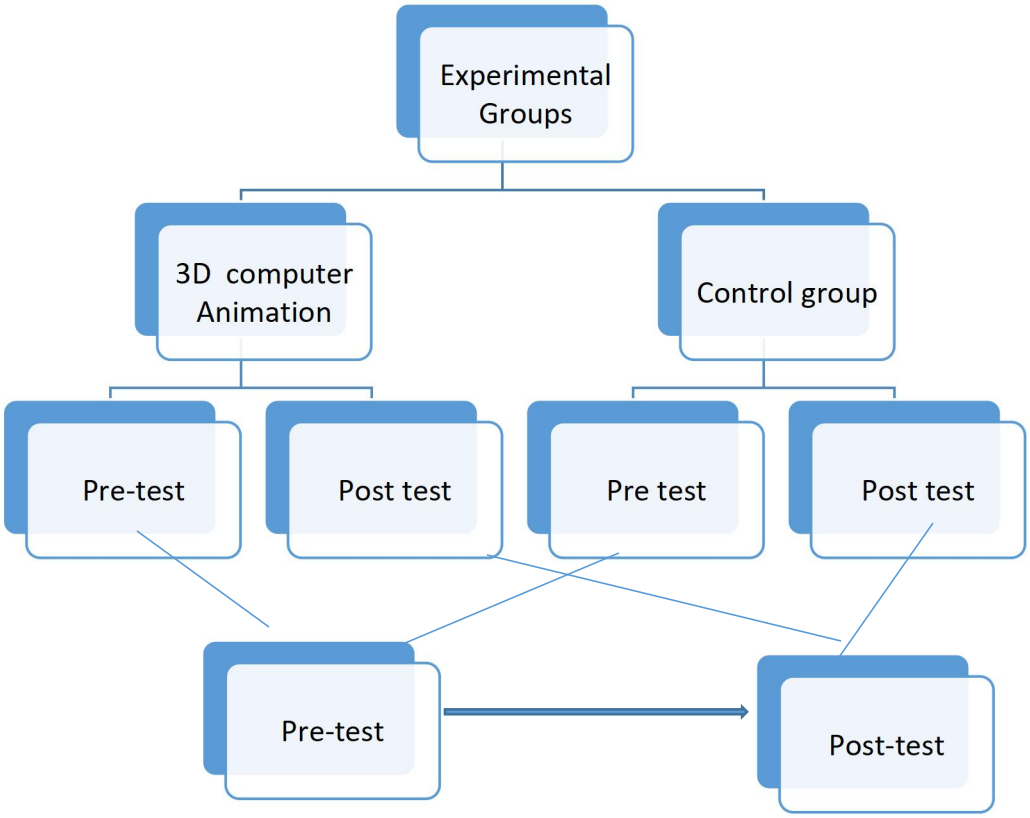
1. There is no significant effect of 3D animation on lower primary school pupils to motivation to study Yoruba culture
2. There is no significant effect of Gender on lower primary school pupils to motivation to study Yoruba culture
3. There is no significant interaction effect of 3D animation instruction and gender on lower primary school pupils to motivation to study Yoruba culture

Methodology

This study used a quasi-experimental design involving pre-test, post-test and control group to examine the effects of 3D computer animation on lower primary school pupils to motivation to study Yoruba culture. A total of fifty seven (57) pupils from two different primary schools formed the study sample. The experiment was carried out during the normal classroom setting to avoid halo effect, thus two intact classes were used. The classes selected from each school were randomized into treatment and control group however, the two schools selected has similar characteristics in terms of pupils age range. The study used Pupils Motivation Questionnaire for data collection. The questionnaire was adapted from Lucy and Mohd (2020). In essence some items were reworked to align with motivation to study Yoruba culture. The questionnaire is a five-point Likert's scale and has twelve items with 0.87 reliability coefficient. The study lasted for five weeks. The data collection processs is described in figure i

Figure i

Flow chart of the data collection process.



The study was carried out under three main stages, at the first stage, pre-test was conducted on the two groups. This involves the administration of the motivation questionnaire. The second stage was where the students were taught for five weeks. The experimental group was taught with the use of 3D computer animation instruction while the control group were not taught with the 3D computer animation instruction. At the third stage, post test was administered on the pupils in the two groups after reshuffling the items in the test. Data collected was analysed using paired sample test and Analysis of Co-variance.

Results

1. **Which gender will return higher motivation mean score after exposure to 3D animation instruction**

Table 1: Pupils motivation mean gain score according to Gender

Gender	N	Mean	S.D.	Mean Gain
Male				
Pre-test	33	6.45	4.23	1.79
Post-test		8.24	2.30	
Female				
Pre-test	24	7.29	3.49	1.08
Post-test		8.37	1.63	
Total				
Pre-test	57	6.80	3.92	1.43
Post-test		8.29	2.03	

The results of motivation before and after exposure to 3D animation instruction base on two levels of gender is shown in Table 1. The outcome showed that males (N = 33) recorded pre-test mean scores of 6.45 with SD of 4.23 and post test mean score of 8.24 (SD = 2.30), this shows average gain of 1.79 Female students (N = 24) showed pre-test mean score was 7.29, SD = 3.49, and post-test mean score was 8.37, SD = 1.63, thus showing mean gain 1.08. The result thus indicates that although male and female showed positive mean gains but male students recorded higher post test mean motivation gains

Test of Hypotheses

1. There is no significant effect of 3D animation on lower primary school pupils to motivation to study Yoruba culture

Table 2: ANCOVA Result Showing the Effect of Treatment, Gender and its interaction on Pupils motivation

Tests of Between-Subjects Effects

Dependent Variable: Post-test (motivation)

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	62.866[a]	4	15.716	4.834	.002
Intercept	770.502	1	770.502	236.988	.000
Pretest	2.400	1	2.400	.738	.394
Treatment	59.560	1	59.560	18.319	.000
Gender	4.713	1	4.713	1.450	.234
Group * Gender	.235	1	.235	.072	.789
Error	169.064	52	3.251		
Total	4157.000	57			
Corrected Total	231.930	56			

a. R Squared = .271 (Adjusted R Squared = .215)

The result of analysis in Table shows a computed F-value of 18.319 and p-value of 0.00 ($p < 0.05$) for treatment group. Since the p-value (computed significance value) is less than the 0.05 alpha level of significance ($p < 0.05$), the null hypothesis is hereby rejected. The result thus

indicates that there is a significant main effect of the treatments on lower primary school pupils to motivation to study Yoruba culture. The result further shows R-square .271. The result of significant main effect of treatment on lower primary school pupils to motivation to study Yoruba culture requires further analysis , this was analysed in table 3

Estimates

Dependent Variable: posttest

Group	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Control	7.286[a]	.337	6.611	7.962
Experimental	9.491[a]	.382	8.723	10.258

a. Covariates appearing in the model are evaluated at the following values: pretest = 6.8070.

The result in table 3 implies that after controlling for pretest effect, the post result shows hat control group recorded 7.286 mean (SD=.337) while experimental group recorded 9.491 mean (SD=.382). Thus experimental group recorded higher post test means score.

H02: There is no significant effect of Gender on lower primary school pupils to motivation to study Yoruba culture.

The result of analysis in Table 2 reveals a computed F-value of 1.450 and p-value of .234 ($p > 0.05$) for gender. Since the p-value (computed significance value) is greater than the 0.05 Alpha level of significance ($p > 0.05$), the null hypothesis is hereby accepted. The result indicates that there is no significant effect of gender on lower primary school pupils to motivation to study Yoruba culture.

H03: There is no significant interaction effect of 3D animation instruction and gender on lower primary school pupils to motivation to study Yoruba culture.

The result of analysis in Table 2 reveals a computed F-value of .072 and p-value of .789 for interaction effect of treatment and gender. Since the p-value (computed significance value) is higher than the 0.05 Alpha level of significance ($p > 0.05$); the null hypothesis is hereby retained. Hence there is not significant interaction effect of treatment and gender on lower primary school pupils to motivation to study Yoruba culture. This outcome implies that the pupils post-test mean scores in motivation across the levels of treatment did not vary significantly across the two levels of gender. The result indicates that there is no significant interaction effect of treatment and gender on lower primary school pupils to motivation to study Yoruba culture.

Discussion of findings

The result shows that 3D animation instruction has significant effect on lower primary school pupils to motivation to study Yoruba culture. This implies that pupils' motivation to learn about Yoruba culture increased as a result of the use of 3D animation instruction. One of the major problem of teaching cultural aspect of Yoruba is teachers inability to sustain pupils attention, it is though understood that pupils at this stage have short span of attention. Through the result it can be claimed that the use of 3D animation was able to sustain pupils' attention. The animation plays a vital role as an exciting learning medium. This is because the visual form of the mobile is accompanied by audio that can be used to explain the content of the lesson that is difficult to convey (Noor et al., 2020). According to Keller (2008), student motivation improves when

knowledge of the lessons learned is significant as their curiosity has stimulated their motivation. Thus, interest and motivation could bring an individual to success and lead them to achieve good results in their studies. This finding confirms that report of Daşdemir and Doymuş (2016) who also found that animation based teaching had a positive effect on students learning. It is also similar to the finding of Onal and Sondur (2017) that found positive and moderate relationship between students' use of animation and their attitude towards technology. The study also finds that gender does not have effect on lower primary school pupils to motivation to study Yoruba culture. This implies that the effect of the 3D animation was relevant to male and female is similar direction as regard their motivation. This is different from the finding of Mubeen et al, (2013) who found females as more intrinsically motivated and males as more extrinsically motivated. It also does not support the submission of Naz (2020) that most of the previous researchers found that female students are more motivated towards the achievement of desirable learning goals as compared to male students.

Conclusion and Recommendations

The use of technology in education have long been proved encouraging at improving students educational outcomes. Hence the adoption of 3D computer animation according to report has helped students to learn in different ways. After experimentation, the study come to conclusion that 3D computer animation instruction has effect on improving pupils' motivation towards learning cultural aspect of Yoruba. It was also deduced from the study that gender is no barrier to the use of the instruction in improving pupils' motivation because no difference was found on male and female pupils' motivation on lower primary school pupils to motivation to study Yoruba culture. The study recommends primary school teachers Yoruba teachers should adopt the 3D computer animation instruction to motivate pupils to learn Yoruba culture. Also Yoruba teachers should be trained on how to make 3D computer animation in order to use it in teaching pupils.

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