

Effect Of Animated Videos On Preschoolers' Cognitive Development In Benue State, Nigeria

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Abstract

The growth of technology has necessitated a change in teaching and instruction especially with children. This study investigated the effect of animated videos on preschoolers' cognitive development in Gboko Local Government Area of Benue State, Nigeria. Two research questions and three null hypotheses guided the study. The study adopted a pretest posttest quasi-experimental research design. The sample for the study consisted of 54 nursery two pupils in two intact classes drawn using simple random sampling technique. The cognitive Skills rating scale was the instrument used for data collection. Mean and standard deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the null hypotheses at 0.05 level of significance. Results showed that animated videos had significant effect on preschoolers' cognitive development, there was no significant gender difference on preschoolers' cognitive development. Also, there was no significant interaction effect of animated videos and gender on preschoolers' cognitive development. It was recommended among others, that teachers should use animated videos in teaching preschoolers in order to enhance their cognitive development.

Keywords: Animated Videos, Preschoolers, Cognitive Development

Introduction

Technology is gaining access to every element of human life, and education sector is not left out. There are increasing signs that innovative teaching techniques facilitated by computer technology have the potential to improve children's learning. The premise is that using computer technology in the classroom can assist maintain children's interest in learning, resulting in improved outcomes. Mayer's (2003) multimedia learning theory, which claims that multimedia learning helps children create mental representations from words and visuals presented to them, backs up this claim. Drawings and beautiful graphics, according to the aforementioned principle, can encourage primary school pupils to share their thoughts. Example of such drawings and images that can help children especially those that are reluctant to learn and pay attention to static materials like most Nigerian children are animated videos.

Animation is a form of motion image creation that involves either hand or computer techniques. Animations, according to Musa, Ziatdinov, and Griffiths (2013), are computer-generated motion pictures that depict the movement of drawn objects. Animations, according to Sinor (2011), are "motion texts with sounds" or "graphics and visuals" that are frequently used in movies to grab children's attention and effectively contribute to their learning. Perhaps this is why Thompson (2010) saw animated films as movies with images that can capture children's attention and interest in order to improve their learning and development. To put it another way, children are thought to learn how to live a long and healthy life through the visual interaction of vibrant pictures such as animations and films. Animated videos are motion visuals intended to pique learners' interest in the current topic. Animated videos appear to be a popular program among children all over the world, probably because its material is simple enough for them to understand. According to Gamble (2007), such movies improve children's learning of alphabets, numeracy, colors, drawings, language acquisition, and cognitive development. Examples of such animated videos include Barney and friends, Teletubbies, Sesame Street, Dora the explorer, Blue's clues, Gali Gali sim sim, Wonder pets, Bob the builder, Noddy among others. These animated videos contain spoken language in which children listen to, and could aid their cognitive development.

Cognitive development can be seen as an active learning through "critical thinking and practical inquiry", which grow out of experience but also involve imagination and reflection upon what is learned. Research has shown that achievement of cognitive presence is dependent upon appropriate teaching and learning skills. Shea, Pickett, & Pelz, (2003) defined cognitive development as the extent to which pupils are able to construct and confirm meaning through sustained discourse in a community of inquiry.

Shea et al maintained that cognitive presence occurs in an environment of "effective teaching presence and satisfactory social presence". Berge (2008) argued that a pedagogical role similar to cognitive development in virtual worlds is driven by a move toward informal, collaborative, reflective learning, with user-generated content". According to Shea et al (2003) cognitive development requires that individuals encounter others who contradict their own intuitively derived ideas and notions and thereby create cognitive conflicts. The resolution of these conflicts leads to higher forms of reasoning. Thus, cognitive development is closely linked to

interaction with others in the class, whether another pupil, the instructor, or course readings. Shea et al. (2003) further explained that the concept of being assessment-centered meant that a good learning community would “provide many opportunities to make their thinking visible and to get feedback in order to create new meaning and new understanding. Therefore, children’s cognitive development for proper acquisition of literacy, numeracy and other life-long skills is the thrust of preschool education.

Preschool education is defined by the Federal Republic of Nigeria's National Policy on Education (FRN, 2014:8) as the first formal education provided to children aged 3 to 5 prior to their entry into primary school. It serves as the foundation for the entire educational system. Preschool's main purpose is to help children move smoothly from home to school. Preschoolers are children who have completed this level of education. Preschoolers, according to Klenk (2001), are children aged three to five. They are energetic, inventive, inquisitive, and eager to learn (Obidike & Enemu, 2016). Preschoolers in this study are children aged three to six years old who are enrolled in a preschool program. These preschoolers generally learn through the use of their sense organs of feeling, touching, seeing and hearing, hence they could be described as concrete or audio-visual learners who could learn better using technologies like animated videos.

Animated videos have been shown in previous research to have a good impact on children's learning. Verhallen, Bus, and de Jong (2006), for example, found that children are more involved in visual pictures, and that when they are in motion, they receive even more visual attention than static illustrations. Ghilzai, Alam, Ahmad, Shaukat, and Noor (2017) investigated the impact of cartoon programs on children's language and behavioral development in Pakistan and discovered that children who watched cartoon videos had a higher level of language acquisition and development than those who were not exposed to cartoons. Lodhi, Ibrar, Shamim, and Naz's (2018), observed that children improved their cognitive competencies after watching animated videos. The study also found that cartoon programs enhanced both intra and interpersonal behaviours of male and female children.

However, it is clear in most Nigerian schools that the lecture approach is the predominate style of instruction, which does not appear to encourage cognitive development in preschoolers as many parents expect. Though learner-centered methods such as video tapes and animated cartoons have the potential to benefit preschoolers' cognitive development, little or no emphasis is generally made on the use of animation presentations for the purposes of teaching and how animation should be developed to promote learning (Musa, Ziatdinov, & Griffiths, 2013). This could account for the paucity of its use in Nigerian preschools and the delayed cognitive development of preschoolers in many of them.

Despite the potential impact on children's cognitive development and learning, there appears to be a paucity of empirical literature on the effect of animated videos on children's learning in Nigeria. Gboko Local Government Area of Benue State is not exempted from the trend based on the literature available to the present researchers. It is therefore needful to explore the effect of animated videos on preschoolers’ cognitive development in Nigeria. Hence, the problem

of this study posed as a question is: What is the effect of animated videos on preschoolers' cognitive development in Gboko Local Government Area, Benue State, Nigeria?

Purpose of the Study

The purpose of the study was to investigate the effect of animated videos on preschoolers' cognitive development in Gboko Local Government Area, Benue State. Specifically, the study sought to determine:

1. the cognitive development of preschoolers exposed to animated videos and those not exposed to it;
2. the influence of gender on cognitive development of preschoolers;
3. the interaction effect of methods and gender on preschoolers' cognitive development.

Research Questions

The study was guided by the following research questions

1. What are the mean cognitive development rating scores of preschoolers exposed to animated videos and those not exposed to it?
2. What are the mean cognitive development rating scores of male and female preschoolers?

Hypotheses

The following hypotheses were formulated in the study and were tested at 0.05 level of significance.

H₀₁: There is no significant effect in the mean cognitive development scores of preschoolers exposed to animated videos and those not exposed to it.

H₀₂: There is no significant effect in the mean cognitive development scores of male and female preschoolers.

H₀₃: There is no significant interaction effect of method and gender on mean cognitive development rating scores of preschoolers.

Method

The study adopted a pretest posttest non-equivalent control group quasi-experimental design. Two nursery and primary schools were selected purposefully from the population of 41 nursery and primary schools located within Gboko urban. The sample for the study was 54 (26 males and 28 female) preschoolers in two nursery three (3) intact classes. The children were between the ages of 4 and 5 years. The criteria for selecting a school was that the school must have a television set, video machine and source of power supply. The school whose class has the aforementioned facilities was assigned to the treatment group and the other without these facilities assigned to control group. The experimental group had 24 (10 males and 14 female) preschoolers while the control group had 30 (16 males and 14 female) preschoolers.

Pretest was first administered before the treatments, then a posttest after the treatments. The illustrations for both the experimental group and the control group lasted for 21 days (three weeks) of 30 minutes per session for each lesson. The difference between the two groups was the watching of animated video containing some poems, rhymes and songs by preschoolers in experimental group and the verbal reciting of the same poems, rhymes and songs by preschoolers in control group as taught by the teacher. The treatments were randomly assigned to the two groups of participants in their intact classes.

The cognitive skill rating scale developed by the researchers was used for data collection. The scale had 15 items which were rated by the classroom teachers that serve as research assistants. The items were rated; Never, Seldom, Often and Always with numerical values of 1, 2, 3 and 4 respectively.

The cognitive skill rating scale and the animated videos (Barney and Friends, 2018 by The Barney company) contained in a DVD were validated by three experts, one in educational technology, one in early childhood education and one in measurement and evaluation unit, all from the University of Nigeria, Nsukka. The reliability estimate of the cognitive skill rating scale after trial testing was established using Cronbach's Alpha and the reliability coefficient obtained was 0.87.

The researchers visited the sample schools and introduced themselves to the school authorities and sought permission to conduct the study using the schools. Parents of the children gave informed consent for the participation of their children in the study through the school authorities. Upon granting of the permission, the researchers recruited two of the teachers that teach the classes as research assistants. The researchers coached the research assistants in the experimental group on the method of using animated videos in teaching for one day while that of the control group was told to use the conventional method of teaching. The researchers then played one of the videos and they watched the videos with the research assistants. After that, two different DVDs of Barney and friend 2018 "let's play school" were given to the research assistant for the experimental group and none was given to the research assistant for the control group. The research assistant for the experimental group was asked to watch the video at home and adapt the content for teaching the children. The research assistant for the control group was taught how to verbally recite the poems, sing the songs and say the alphabets. The researchers also gave the research assistants the pretest instruments to rate the preschoolers before the commencement of treatment.

The sessions for both groups were held in their classrooms. In all the 21 sessions, preschoolers in the experimental group watched the videos while the control group were expected to recite the poems, sing the songs and say alphabets, colours and others as taught by the teacher without the video. One session of 30 minutes took place each day for 21 days for both groups. Post-testing was conducted for both groups (experimental and control) a day after the last session. Data collected were analyzed using mean and standard deviation in answering the research questions while Analysis of Covariance (ANCOVA) was used to test the hypotheses at 0.05 level of significance.

Results

This section deals with the presentation of results. The results are presented in Tables in line with the research questions and the null hypotheses formulated for the study.

Research Question One:

What are the mean cognitive development rating scores of preschoolers exposed to animated videos and those not exposed to it?

Table 1: Pretest and Post-test Mean Cognitive Development Rating Scores of Preschoolers exposed to Animated Videos and those not exposed to it

Groups	N	Pretest		Posttest		Mean Difference
		\bar{x}	SD	\bar{x}	SD	
Experimental (with animated video)	24	1.52	0.15	2.63	0.17	1.11
Control (No animated video)	30	1.48	0.18	2.32	0.25	0.84

Result in Table 1 shows that the preschoolers who were exposed to animated video had cognitive development score of ($\bar{x} = 1.52$, $SD = 0.15$) at the pretest and cognitive development score of ($\bar{x} = 2.63$, $SD = 0.17$) at the posttest, while those who were taught without animated video had cognitive development score of ($\bar{x} = 1.48$, $SD = 0.18$) at pretest and cognitive development score of ($\bar{x} = 2.32$, $SD = 0.25$) at posttest. Mean difference of 1.11 and 0.84 for the experimental and control groups respectively imply that animated video had positive effect on the mean cognitive development scores of preschoolers than the conventional method.

Hypothesis One

H₀₁: There is no significant difference in the mean cognitive development scores of preschoolers exposed to animated videos and those not exposed to it.

Table 2: Analysis of Covariance (ANCOVA) of the Effect of Animated Video on cognitive Development of Preschoolers.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1.445 ^a	4	.361	6.943	0.00	0.362
Intercept	2.627	1	2.627	50.497	0.00	0.508
Pretest	.039	1	.039	.755	0.38	0.015
Group	1.421	1	1.421	27.317	0.00	0.358

Gender	.091	1	.091	1.743	0.19	0.034
Group *	.001	1	.001	.016	0.90	0.000
Error	2.549	49	.052			
Total	330.911	54				
Corrected Total	3.993	53				

Note: S = Significant, NS = Not Significant, η^2_p = partial eta squared

The result on Table 2 shows that the effect of animated video on cognitive development of preschoolers was significant ($F(1, 49) = 27.317, p < .05, \eta^2_p = .358$). Since the exact probability value of 0.00 is less than 0.05 set as level of significance, the null hypothesis which states that there is no significant difference in the mean cognitive development scores of preschoolers exposed to animated videos and those not exposed to it is rejected. Thus, inference drawn is that there is a significant difference in the mean cognitive development scores of preschoolers exposed to animated videos and those not exposed to it. The result further showed the effect size of ($\eta^2_p = .358$), which indicate that 35.8 percent variance in cognitive development of preschoolers is explained by the use of animated video.

Research Question Two:

What are the mean cognitive development rating scores of male and female preschoolers?

Table 3: Pretest and Post-test Mean Cognitive Development Scores of Male and Female Preschoolers

Gender	N	Pretest		Posttest		Mean Difference
		\bar{x}	SD	\bar{x}	SD	
Male	26	1.52	0.13	2.47	0.26	0.95
Female	28	1.48	0.11	2.44	0.28	0.96

Result on Table 3 shows that the male preschoolers had cognitive development score of ($\bar{x} = 1.52, SD = 0.13$) at the pretest and cognitive development score of ($\bar{x} = 2.47, SD = 0.26$) at the posttest, while female preschoolers had cognitive development score of ($\bar{x} = 1.48, SD = 0.11$) at pretest and cognitive development score of ($\bar{x} = 2.44, SD = 0.28$) at posttest. Mean difference of 0.95 and 0.96 for male and female preschoolers respectively shows that the female preschoolers had cognitive development scores slightly more the male preschoolers. To test for gender difference on cognitive development, see hypothesis two.

Hypothesis Two

H₀₂: There is no significant difference between the mean cognitive development scores of male and female preschoolers.

The result on Table 2 result shows that the difference between the cognitive development scores of male and female preschoolers was not significant ($F(1, 49) = 1.743, p > .05, \eta^2_p = 0.03$). Since the probability value of 0.19 is greater than 0.05 set as level of significance, the null hypothesis which states that there is no significant difference between the mean cognitive development scores of male and female preschoolers is not rejected. Thus, inference drawn is that the difference in the mean cognitive development score of male and female preschoolers is not statistically significant.

Hypothesis Three

H₀₃: There is no significant interaction effect of methods and gender on mean cognitive development scores of preschoolers.

The result on Table 2 shows that the interaction effect of methods and gender on mean cognitive development scores of preschoolers was not significant ($F(1, 49) = 0.016, p > .05, \eta^2_p = 0.00$). Since the associated probability value of 0.90 was greater than 0.05 set as level of significance, the null hypothesis which stated that there is no significant interaction effect of methods and gender on mean cognitive development scores of preschoolers was not rejected. Inference drawn is that the interaction effect of methods and gender on mean cognitive development scores of preschoolers is not statistically significant. Figure one also revealed that there was no significant interaction effect of methods and gender on mean cognitive development scores of preschoolers. This is evident when the gender (male and female) lines drawn against the methods do not intercept at a point. The graph is shown below.

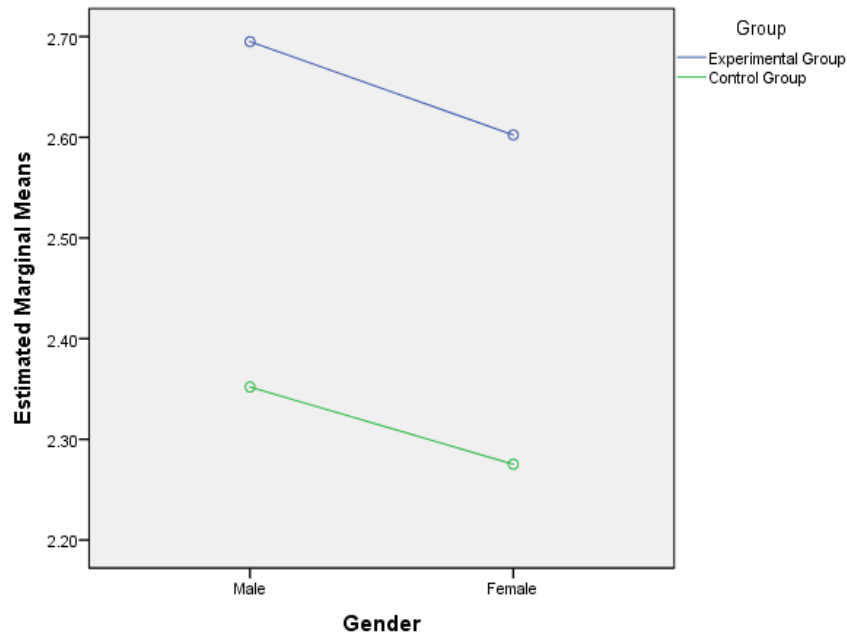


Fig. 1: Graph showing the interaction effect of methods and gender on preschoolers' cognitive development

Figure 1 indicated that there was no interaction effect of methods and gender on mean cognitive development scores of preschoolers. The lines on the graph are parallel to each other indicating that there is no interaction effect of methods and gender on preschoolers' cognitive development.

Discussions

The main purpose of this study was to investigate the effect of animated videos on preschoolers' cognitive development in Gboko Local Government Area of Benue State, Nigeria. The findings of the study shows that animated video had positive effect on the cognitive development scores of preschoolers. It was further revealed that there is a significant difference in the mean cognitive development scores of preschoolers exposed to animated videos and those not exposed to it. This implies that animated video is more effective in enhancing cognitive development of preschoolers than the conventional method of teaching preschoolers. The result is in line with the findings of Ghilzai, Alam, Ahmad, Shaukat, and Noor (2017) who found that children who watch cartoons videos showed high level of language acquisition and cognitive development. The findings also lend support to the reports of Takacs and Bus (2016) who revealed that animated books resulted in better comprehension than static books. The findings could be so because the animated video catches children attention and they are motivated in learning and acting the characters in the video.

The findings of the study also revealed that female preschoolers had slightly cognitive development scores more than the male preschoolers. However, result further revealed that the difference in the mean cognitive development score of male and female preschoolers was not statistically significant. This shows that gender is not a significant factor in determining preschoolers' cognitive development. The findings is in line with that of Lodhi, Ibrar, Shamim,

and Naz (2018) who disclosed that cartoon programs enhanced both intra and interpersonal behaviours of both male and female children. Moreover, the interaction effect of method and gender on mean cognitive development scores of preschoolers was not statistically significant. The findings was also in agreement with that of Takacs and Bus (2016) who revealed that there was no significant interaction effect of method and gender. The implication is that both male and female preschoolers benefitted from the method alike. This could be so because the animated video used had both male and female characters, hence, preschoolers will not differ in the way they watch cartoon videos and as such they could also enjoy cartoon videos in similar ways.

Conclusion

Based on the findings, the researchers conclude that animated videos have significant positive effect on preschoolers' cognitive development. It was also concluded that gender is not a significant factor in preschoolers' cognitive development. Thus, there was no significant interaction effect of method and gender on preschoolers' cognitive development.

Recommendations

Based on the findings, the researchers recommended that:

1. Animated videos should be employed by teachers in teaching preschoolers to enhance their cognitive development.
2. School administrators should provide necessary facility that will enable the use of animated videos in teaching preschoolers.

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Data availability

The data that support the findings of this study are available from the authors upon reasonable request.

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