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Enhancing Active-Learning Through Interactive-Video for Teaching Pottery in Selected Upper-Basic Schools, Nigeria

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Abstract

The use of interactive-video for teaching is a possible solution to the inadequacy of instructional materials because it enhances acquisition of practical skills in basic technology. The objective of this study was to determine the difference between performance of students taught using interactive-video and their counterparts taught using expository method. Thus, one research question was raised and one hypothesis was tested. The population for the study comprised all upper-basic students in Kwara State, Nigeria. Thus, the sample comprised of 32 students each from the two-sampled upper-basic schools. The sampled schools were randomly assigned to experimental and control groups. The quasi-experimental design was adopted. One research question raised was answered through its corresponding hypothesis one, which was tested through the Analysis of Covariance. Thus, the finding of study revealed that significant difference was established between the students taught using the interactive-video and their counterparts taught using expository method in favour of those who used the interactive-video. Therefore, the study concluded that interactive-video affords greater interaction between the teacher and students. In addition, it greatly enhanced the academic achievement of students. The study recommended that interactive-video should be permanently involved in the teaching of basic technology.

Keywords: *Basic Technology; Information and Communication Technology; Interactive-Video; Pottery*

1. Introduction

Information and Communication Technology (ICT) augments teachers' emphasis on individualized instruction. Hence, individualized instruction can simply be achieved through the utilization interactive-video-based instruction. ICTs assist teachers to use more time with individual student, with less time for lecturing the whole class, thereby involving students to carry out more self-regulating work. ICTs are transformational outfit, which when used appropriately, can encourage the transformation of instruction from teacher-centred to a learner-cantered. ICT deals with the latest communication using computer facilities. Hence, ICT is used to complement the conventional teaching method of basic technology. Utilization of instructional materials in teaching and learning process would assist the learners to have the necessary and quality learning experiences that can bring about meaningful and productive learning. The use of instructional materials in teaching guarantees greatest value and effectiveness in teaching and learning process. However, teachers should ensure the careful use of instructional materials based on how to achieve the stated instructional goals and objectives (Amosa, 2013).

Instructional materials offer learning experiences that facilitate positive reactions from students. Amosa (2013) noted that learning and instructional materials are channels through which subject matter or learning contents are dispersed. At the same time, one has to understand that materials are used not only to arouse the interest of the learner but to also explain something more concrete and clearer. Thus, some printed materials such as books, newspapers journals, magazines, pamphlets, and handout are equipped with visual illustrations to bring about the learners' understanding (Abolade, 2009).

The National Policy on Education (FRN, 2009) noted that basic technology should be taught at the upper-basic classes. This is based on the integration of

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an individual into a sound and effective citizen. Basic technology is a compulsory subject in the 9-year Basic Education programme. Its purpose is to contribute to the achievement of the national education goals through; inculcation of technological literacy, that is basic understanding of and capacity in technology, exposure of students to the world of work to march their talents and interest for wise vocational choice, and inculcation of positive attitude towards work as a source of human identity, livelihood and power (NERDC, 2007).

Basic technology is a subject taught at the upper-basic class, which at the onset of the 6-3-3-4 system of education in Nigeria referred to as Introductory Technology. As indicated by the Nigerian Educational Research and Development Council (NERDC, 2007) the nomenclature was changed to Basic Technology with emphasis on the incorporation of information and communication Technology in its teaching and learning. If basic technology is well taught with both practical and theoretical teaching strategies, should promote development of valuable skills in the repair and maintenance of equipment needed for everyday living.

In appreciation of the junior secondary school programme, and with the compound subject basic technology, it is obvious that basic technology which is a core subject in the upper-basic education system, involve the academic and practical study in materials and source of energy with sole aim of providing a broad based skills development approach to practical knowledge and skills acquired are used in the services of man in providing his daily needs as well as making his environment more conducive for his continual survival. The Federal Republic of Nigeria, National Policy on Education (FRN, 2009) regarded Basic Technology as a way of life and the gateway to industrialization; it is accepted as a vehicle of productivity. The resources for teaching traditional pottery in basic technology make students to be involved in practical tasks.

Clay is a major raw material used in the production of pottery, it is a fine-grained material consisting mainly of hydrated aluminum silicates that occurs naturally in soil and sedimentary rock (Bartel, 2011). Traditional pottery making is still a living craft in Nigeria. Traditional poetry making is done with the hands and a few ancient tools. Potters carry out the work by avoiding pottery wheels, using minimal tools and firing in earthen pits. Some potters actually desire traditional pottery making on a wheel (Daniels, 2013). According to Bartel (2011), clays may be classified in various ways, depending on what properties are of interest to the classifier. One might classify clays according to their colour as they exist in nature. Hence, the classification might centre on the idea of use, or of geologic origin.

There are basic stages in traditional pottery making. These are:

a. Collection of Clays: Traditional pottery production commenced with the collection of the clays from natural deposits in the earth. Natural clay is found in shades of red, gray, yellow and white. Before the potter could begin forming the clay, he had to remove any unwanted particle. This process required kneading the clay to eliminate the entire irregularities. Kneading means to fold, press, and stretch ball clay mixed with kaolin clay until a smooth uniform mass is achieved (Jennigs, 2014).
b. Drying and Firing: Two stages are considered in firing, first stage or biscuit firing; the porter will place the dried grasses on the surface and place the pots where the dried grasses are spread. After setting the pots on the dried grasses, the dry grasses will equally be spread on the surface of the pots, then, the fire will be set on the pot.
c. Final stage of firing or intensive firing is done on the surface. This is by placing logs and sawdust side by side to form the surface for the firing. The pots are then placed on the surface and supported with logs, iron roofing sheets, sawdust and dry grasses until all the pots are covered. Then, the pots are set on fire. The firing will cover duration of 14 hours. After firing, the clay pots are capable of holding liquids and cooking food. However, the content, traditional pottery will be packaged using interactive-video-based instruction and to be evaluated by means of Kirkpatrick evaluation model.

Interactive-video instructional package illustrates any form of video technology that offers opportunity to learners to have several levels of interaction between the package and learners. The benefits of interactive-video instructional package are the ability for the learner to play, replay, pause and rewind to any precise segment of the tape. In addition, it assists the students to deliver technical training concerning the process of carrying out the experiment and testing their skills through simulations (Clothier, 2013). Interactive-video instructional package provides a high-quality vehicle for active-learning because they can be used to arrest and stimulate the interest of the learners (Lehman, 2006).

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The interactive-video instructional package may guarantee productive learning experiences and encourage self-assessment by students irrespective of gender. Irrespective of gender, instructional system design models classically spell out a method that if pursued, will aid the transfer of knowledge, skills and attitude to the learner, trainee or receiver of the instruction. Interactive-learning materials in teaching and learning are the materials, which assist learners' interactions with learning materials in which learners are allowed to move at their own pace (Marsh, Mitchell & Adamczyk, 2010). When interactive-learning materials are well designed, the teaching and learning becomes interesting and productive.

In addition, interactive-video instruct tional package allows teachers to provide learners with recurrence of crucial stages in the production of traditional pottery by playing and replaying the interactive-video. This allows for effective teaching because of its ability to cater for the individual differences of learners (Clothier, 2013). Using Interactive-video instructional package to teach the production of traditional pot can inspire students who want to try the pottery production. Also, the package can encourage self-discovery of learning when students are supplied with materials. Interactive-video instructional package is an interactive-learning material where the learners are active participants rather than being passive. If it is well designed, an interactive-video is active because it makes learning to be productive and it allows individualized learning instruction (Yuh-Tyng & Lin-Fan, 2012). Interactive-video instruct tional package is a means of interacting with multimedia learning materials to facilitate the teaching and learning process. It is the involvement of video as a hardware and video disk or video tape as software to deliver the instruction.

The study sought to examine the influence of interactive-video package for teaching pottery in basic technology on upper-basic students' performance in Kwara State, Nigeria. Specifically, the study was to determine the difference between performance of students taught using interactive-video instructional package and their counterparts taught using expository method

The following research question was answered in the study. What is the difference between the performance of students taught using interactive-video instructional package and their counterparts taught with expository method? The following null hypothesis was tested at 0.05 level of significance: **Ho1**: There is no significant difference between the performance of students taught using interactive-video instructional package and their counterparts taught using expository.

2. Method

The population for the study was all upper-basic school students in Kwara State, Nigeria while the students from two upper-basic schools in the two different local government areas of the state constituted the target population of the study. The sample comprised students of upper-basic nine (JSS 3) from two purposively selected schools. Thus, the sample comprised of 32 students each from the two-sampled upper-basic schools. The two sampled schools were randomly assigned to experimental (32 students) and control groups (32 students). Two instruments were used to gather the relevant data for this study: interactive-video instructional package (treatment) and basic technology achievement test: These instruments were designed by the researchers to determine the effectiveness of the developed interactive-video instructional package on pottery in basic technology. The questionnaire 'Basic Technology Achieveme nt Test' (BTAT) contained 30 items with multiple choice responses. It was in line with the contents in the treatment (interactive-video instructional package for basic technology pottery), which was used to measure the performance of students in both pre-test and post-test.

The quasi-experimental, non-equiv alent, non-randomized, pre-test, post-test control group design was adopted for the study. The experimental group received the treatment using the interactive-video-based instruction (treatment) alongside expository method while the control group was taught using expository method only. One research question raised in the course of the study was answered through its corresponding hypothesis one which was tested through the Analysis of Covariance (ANCOVA) to ascertain whether any significant difference exists at 0.05 significant levels.

3. Results and Discussion

Hypothesis One: There is no significant difference in the performance of students when taught using interactive-video instructional package and their counterparts taught using expository. To establish whether there was significant difference in the performance of the experimental group and control group, the Analysis of Covariance using pre-test as covariate was used as shown in Table 1.

Table 1. ANCOVA of the Achievement Scores of the Experimental and Control Groups

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Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	349.369[a]	2	174.685	18.465	0.000
Intercept	2674.613	1	2674.613	282.725	0.000
Pre-Test	43.119	1	43.119	4.558	0.037
Groups	318.969	1	318.969	33.717	0.000
Error	577.068	61	9.460		
Total	28732.000	64			
Corrected Total	926.438	63			

a. R Squared = 0.377 (Adjusted R Squared = 0.357).

Table 1 indicated that F (df 2, 63) = 33.717, P = 0.000 (P < 0.05), thus main effect was significant at 0.05 alpha level. The result reveals that the instructional package produced a significant effect on the post-test achievement scores of the students when covariate effect (pre-test) was controlled. This implies that there was a significant difference between the students taught using interactive-video instructional package and their counterparts taught using expository method. The analysis established that the students taught using interactive-video instructional package performed better than those students taught using expository. Therefore, null hypothesis one is rejected.

The finding of this study on the basis of the research question and tested research hypothesis was summarized that there was a significant difference in the academic performance of students (experimental group) taught using interactive-video instructional package and their counterparts (control group) taught using expository method in favour of those who used the instructional package. The difference between performance of students taught using interactive-video instructional package and their counterparts taught using expository method:

Research hypothesis one sought the difference among the performance of students taught using interactive-video instructional package and their counterparts taught with expository method. The finding of the null hypothesis one (Ho1) as discussed in table 1 was thereby rejected. Thus, the result reveals that there was a significant difference in the academic achievement of students (experimental group) taught using interactive-video instructional package and their counterparts (control group) taught using expository method in favour of experimental group.

Therefore, the finding agreed with the finding of Isiaka (2007) which revealed that students taught using video-based instruction performed better than their counterparts taught using conventional method. In the opinion of Hammond, et al. (2014), interactive-video tools had the potential to develop procedural skills while offering an engaging road safety educational experiencing, which could positively impact on road crossing behaviour.

The basis for the agreement of findings by Isiaka (2007), Hammond, et al. (2014), Russell and Newton (2008), Fadde (2006) and Frazoni, et al. (2014) with the present study was the use of interactive-video in teaching and learning process, which calls for greater interaction between the learners and the instructional package. However, the outcome of this study contradicts those of Schare, Dunn, Clark, Sled and Gilman (1991) who found that students' achievement under interactive-video was not significantly different under traditional lecture situation. Based on the findings of this study, it was recommended that basic technology teachers should incorporate the use of interactive-video-based instruction to teach basic technology in Nigerian upper-basic schools.

4. Conclusion

From the existing research data and the results of the analysis, it can be concluded that the use of interactive video can improve student academic achievement. In addition, there was a significant difference between students who were taught using video-interactive and their colleagues who were taught using expository methods that supported those using interactive videos. Thus this study concludes that interactive video provides greater interaction between teachers and students.

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