EFFECT OF STANDARD AND IMPROVISED INSTRUCTIONAL MATERIALS ON UPPER BASIC STUDENTS' ACADEMIC PERFORMANCE IN COMPUTER STUDIES IN ILORIN, KWARA STATE

[1]MUHAMMED, K. J., [2]AMOSA, A. A. (PhD) & [3]TIJANI, A. A.

[1,2&3]Department of Educational Technology, Faculty of Education,
University of Ilorin, Ilorin, Nigeria.

Corresponding Author: *jimoh.km@unilorin.edu.ng*

Abstract

This study examined the effect of using standard instructional materials (real or concrete learning materials) and improvised instructional materials on upper basic students' performance in computer studies in Ilorin, Kwara State. The research employed a quasi-experimental design of the pretest-posttest non-randomized design. The experimental group was exposed to standard instructional materials while the control group was exposed to improvised instructional materials. Two research questions and two hypotheses were answered and tested respectively. Two upper basic schools from two different local government areas (Ilorin East and Ilorin South Local Government Areas) using purposive sampling technique were selected for the study. The selected schools had 30 students in each of the intact classes. Two instruments: treatment, which was considered as standard instructional materials such computer monitor, keyboard, mouse, CPU (in operation) and computer studies performance test containing 25 items with multiple responses were used to gather the relevant data for the study. The following findings were made (1) significant difference existed between the performance of upper basic students taught computer studies using standard instructional materials and those taught using improvised instructional materials in favour of standard instructional materials. i.e. {F (1, 29) = 0.003, p <0.05} (2) gender was found to have no influence on the performance of students taught computer studies using standard instructional materials. i.e. {F (1, 29) = 0.694, p > 0.05}. Based on these findings, it was recommended among others that teachers should intensify more efforts in the use of standard instructional materials and consider the use of improvised instructional materials as an alternative.

Keywords: Upper basic school, Standard instructional materials, improvised instructional materials, Computer studies.

Introduction

Education remains an instrument of change and national development. It is a social process and the medium for the acquisition of relevant knowledge, skills and attitudes for survival in a changing world. In the Nigeria education continuum, basic education is the foundation, which requires a sound knowledge through modern technologies such as information and communication technology tools. Information and Communication Technology (ICT) deals with the latest communication in teaching and learning

using computer facilities. The computer is acknowledged as a device that is electronic-based information, which teachers and learners use to achieve productive teaching-learning process. It is used and achieved through the input, process and output inform of garbage in and garbage out as designed by the programmer and/or operator (Amosa, Abdulrahman, Oladosu & Alasan, 2016). Therefore, the use of standard instructional materials to teach computer studies would enhance the effective teaching-learning process of the subject.

Computer studies as a science and practically oriented subject require the use of standard instructional materials. This implies that effective teaching-learning process of this subject cannot be achieved without the use of instructional materials. Computer technology has a deep impact on the education sector. The teaching-learning process of computer studies has become easier and much more exciting than before. Owing to memory capacities of computers, large portions of data can be stored for the benefits of teaching and learning (Yusuf, 2011). Therefore, outstanding increase in the usefulness of computers as learning and instructional materials influences an increase in the various form of computer-based instruction.

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 (Amosa, 2016). Thus, the teaching and learning of computer studies need to be actively handled, thus full integration of instructional materials should be paramount important to teachers. Instructional materials are indispensable to the teaching and learning process, it is described as a conveyance of learning experiences that the teachers need to facilitate the teaching-learning process (Amosa, 2013).

Learning materials can either be standard instructional materials or improvised instructional materials. Standard instructional materials can be referred to as realia or concrete learning materials. These are concrete objects, real materials (different from depiction or models) as they are without modification. Realia include tools, artefacts, plants, animals and others which have great educational values in teaching and learning process (Amosa, 2017). Technology has commenced influencing the use of standard instructional materials (realia objects) by integrating the virtual realia option, whereby three-dimensional learning materials can be presented through projection or computer screens (Wikipedia, 2017). They are the concrete objects such as computer monitor, CPU, mouse, keyboard, among others.

Utilization of instructional materials is to enable the pre-service and in-service teachers to develop the necessary skills for the effective teaching-learning process. In situations where any of the standard instructional materials are not readily available or too expensive, they can be improvised (Amosa, 2017). Franzer, Okebukola and Jegede, (1992) opined that the skills acquired by the professionally qualified science teachers cannot be practicalized if required learning materials for instruction are not available to. Pre-service and in-service teachers should be aware that if properly produced and utilized, improvisation of instructional materials has the same value with original or standard instructional materials. So, there should be synergy between the policy makers and teachers in the areas of provision of fund accessible for the improvisation of instructional materials (Onasanya & Omosewo, 2011).

Onasanya, Adegbija, Olumorin and Daramola (2008) remarked that improvisation of instructional materials calls for inspiration, creativity, inquisitiveness and perseverance among the teachers and students. The researchers stressed further that such skills could only be achieved with effective training on the improvisation of instructional materials.

Improvisation is described as using alternative learning materials through the available local materials to facilitate teaching efficiency and improve students' academic performance on the account of non-availability of standard learning and instructional materials. In other words, improvisation is used to substitute already made materials and assists in the realization of construction of knowledge and allows the utilization of resources available in our community. Learning and instructional materials guarantee productive learning experiences and encourage self-assessment by students without gender biased. Irrespective of gender, instructional materials, if appropriately used, would aid the transfer of knowledge, skills and positive attitude towards teaching and learning.

Research Questions

The following research questions were answered in the study.

1. What is the difference between the performance of upper basic students taught computer studies using standard instructional materials and their counterparts taught computer studies using improvised instructional materials?

2. What is the difference between the performance of male and female upper basic students taught computer studies using standard instructional materials and their counterparts

taught using improvised instructional materials?

Research Hypotheses

Based on the research questions, the following hypotheses were tested.

Ho₁: There is no significant difference between the academic performance of upper basic students taught using standard instructional materials and their counterparts taught computer studies using improvised instructional materials.

Ho₂: There is no significant difference in the performance of male and female upper basic students taught computer studies using standard and improvised instructional materials.

Methodology

All upper basic school students in Kwara State constituted the population of this study.. The two schools were randomly selected and randomly assigned to the experimental and control groups. In each selected school, an intact class upper basic was randomly selected. Each class had a population of 45 to 50 students. Thus, from each of the two selected classes, 30 students were randomly selected to ensure effective classroom management. The two-sampled upper basic schools were: Taoheed upper basic School, Basin Ilorin (Experimental Group) and Burhanudeen upper basic school, Isale-Koko Ilorin (Control Group). The researchers-designed questionnaire used to gather data for this study was: (i) Computer studies performance test of 0.86 reliability index – this is the test instrument used for pretest and posttest to test the effectiveness of standard instructional materials. While the second instrument was standard instructional materials (real objects) - (ii) practical skills (treatment) using standard instructional materials such as real objects like computer set, CPU, keyboard and mouse (real objects). The research design was a quasi-experimental design, the pretest-posttest non-randomized control group design, carried out in two selected upper basic schools in Kwara State, Nigeria.

Results

This section presents the analysis and interpretation of data collected for this study. Data obtained with respect to research questions were analysed using mean and ANCOVA was used to test the hypotheses.

Demographic Information of Respondents

Table 1: Demographic Distribution of Respondents based on Gender

Respondents	Frequency	Percentage
Male	32	53.3%
Female	28	46.7%

Table 1 revealed that 32 (53.3%) of the respondents were male students while 28 (46.7%) of the respondents were female students.

Research Question 1: What is the difference between the performance of upper basic students taught computer studies using standard instructional materials and their counterparts taught using improvised instructional materials

Table 2: Mean performance scores of students taught computer studies with standard instructional materials and improvised instructional materials

Groups	N	Pretest Mean	Posttest Mean	Mean Gain Score
Experimental Group	30	12.03	17.40	5.37
Control Group	30	12.50	16.70	4.20

Table 2 revealed that there was an improvement in the post-test scores of two groups, thus the group who were taught with standard instructional materials had a higher mean gain score. For instance, students taught with improvised instructional materials had a mean gain score of 4.20 while students taught using standard instructional materials had a mean gain score of 5.37.

Research Question 2: What is the difference between the performance of male and female upper basic students taught using standard instructional materials and their counterparts taught computer studies using improvised instructional materials?

Table 3: Mean performance scores of male and female students exposed to standard instructional materials

Gender	N	Pretest Mean	Posttest Mean	Mean Gain Score
Male	22	17.50	12.27	5.23
Female	8	17.13	11.38	5.75

Table 3, revealed that both male and female upper basic students taught computer studies using standard instructional materials had close margin mean gain scores of 5.23 and 5.75 respectively. This implies that the treatment improved the performance of the students exposed to standard instructional media irrespective of gender.

Hypotheses Testing

Hypothesis One: There is no significant relationship between the academic performance of upper basic student' taught using standard instructional materials and improvisation of instructional materials for teaching

Based on the raised research question one, the following hypothesis was formulated and tested to determine whether there was a significant difference in the post-test mean scores of students in the first and second groups, which were taught using standard instructional materials and improvised instructional materials respectively.

Table 4: ANCOVA result of the mean performance scores of experimental and control groups

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	.840[a]	2	.420	.077	.926	.006
Intercept	268.475	1	268.475	49.527	.000	.647
Pretest	.015	1	.015	.003	.959	.000
Gender	.837	1	.837	.154	.697	.006
Error	146.360	27	5.421			
Total	9230.000	30				
Corrected Total	147.200	29				
a. R Squared = .006 (Adjusted R Squared = -.068)						

Table 4 showed that $F (1, 29) = 0.003$, $p < 0.05$ was significant. The results revealed that the standard instructional materials produced a significant effect on the post-test achievement scores of students when covariate effect (pre-test) was controlled. Hence, hypothesis one was rejected. Therefore, there was a significant difference between the performance of upper basic students taught computer studies using standard instructional materials and those taught using improvised instructional materials in favour of standard instructional materials.

Hypothesis Two: There is no significant difference in the performance of male and female upper basic students taught using standard and improvised instructional materials.

Table 5: ANCOVA result of the mean performance scores of males and female upper basic students exposed to standard instructional materials

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	.825[a]	1	.825	.158	.694	.006
Intercept	1041.384	1	1041.384	199.206	.000	.877
Gender	.825	1	.825	.158	.694	.006
Error	146.375	28	5.228			
Total	9230.000	30				
Corrected Total	147.200	29				

a. R Squared = .006 (Adjusted R Squared = -.030)

Table 5 showed that an $F_{(1, 29)} = 0.694$, $p > 0.05$ was not significant. The results revealed that there was no significant difference in the performance of upper basic students exposed to standard instructional materials based on gender. Hence, hypothesis two was not rejected.

Summary of Major Findings

Based on the analysis of responses from the study, it was revealed that:

1. The use of standard instructional materials improved the learning outcomes of upper basic school students in learning computer studies.

2. There was a significant difference between the performance of upper basic students taught computer studies using standard instructional materials and those taught using improvised instructional materials in favour of standard instructional materials.

3. Gender was found to have no influence on the performance of students taught using standard instructional materials for the teaching and learning computer studies. Hence, hypothesis two was not rejected.

Discussion

The findings from this study indicated that the use of standard instructional materials improves students' academic performance and enhances teaching-learning effectiveness. This could be due to the fact

that the standard instructional materials are real and concrete learning materials that are the to deal with the subject like computer studies. It can be deduced now that significant difference existed between students taught with standard instructional materials and those taught with improvised instructional materials during students' exposure to the treatment conditions in favour of the group taught with standard instructional materials. This finding disagrees with the finding of Onasanya and Omosewo (2011), which opines that the use of standard instructional materials has similar importance in the teaching and learning.

In addition, the result of the analysis revealed that gender was found to have no influence on the performance of students taught using standard instructional materials for the teaching and learning computer studies. This finding agreed with the submission of Amosa (2013) who reported that female students are as brilliant as male students. Also, Demirkol and Kazu (2014) carried out a comparative study on the academic performance, rating distributions and differences in gender academic achievement, it was found out that no significant difference existed among the groups. Conclusively, it should be noted that real or concrete learning materials is the best to facilitate the effective teaching-learning process. Thus, if standard

instructional materials are not provided by the government or school management for instruction, improvised instructional materials can be considered as alternatives to facilitate the teaching-learning process.

Conclusion

This research investigated the effect of standard and improvised instructional materials on upper basic students' performance in computer studies in Ilorin, Kwara State. Results obtained and analysis carried out in the study established that standard instructional materials, which are hardware (real objects) and software such as computer, CPU, software programmes among others facilitate teaching-learning process. In addition, it assists the students to deliver technical training in the acquisition of practical skills. Also, there was a significant difference in the academic performance of students taught using standard instructional materials (experimental group) and their counterparts (control group) taught using the conventional method in favour of the experimental group. This implies that the students' performance, when exposed to standard instructional materials, was impressive. Finally, there was no significant difference between the post-test scores of male and female students taught using standard instructional materials. This is due to the fact that both (male and

female) standard instructional material is gender biased.

Recommendations

The following recommendations were made based on the findings of this study:

1. Teachers should intensify more efforts in the use of standard instructional materials and consider the use of improvised instructional materials as an alternative to the teaching-learning process.

2. Irrespective of gender, computer teachers and students are encouraged to teach and learn with standard instructional materials respectively because is the best for any practically oriented subject.

3. Since the findings of this study showed that students who taught using standard instructional materials performed better than those taught with improvised instructional materials, teachers, textbook writers and curriculum planners should emphasize the use of standard instructional materials for effective teaching and learning at all levels of education.

4. Standard instructional materials should be constantly used to complement the conventional method of teaching and ease teaching-learning process among teachers and students.

References

Amosa, A. A. (2013). Effect of Community Resources on Junior Secondary Schools' Performance in Basic Technology in Ilorin. 21(1), 214-221. *Online http://Jeda-uniport.com/pdf/jeda. Vol 21 march 2013.pdf*.

Amosa, A. A. (2016). Evaluation of A Developed Interactive Video Instructional Package for Basic Technology Concept in Nigerian Schools Using Kirkpatrick Model. Unpublished (Doctoral dissertation) Department of Educational Technology, University of Ilorin, Ilorin, Nigeria.

Amosa, A. A. (2017). Utilization of instructional materials for the effective teaching-learning process. Paper presented at the workshop organized by Ilorin Emirate Descendant Progressive Union for teachers across Kwara Central Senatorial District on 19th July 2017.

Amosa, A. A., Abdulrahman, M. R, Oladosu, K. K. & Alasan, J. N. (2016). Problems and prospects of computer science education. In N. A. Adedokun-Shittu (Ed.), Method of Teaching Science, Basic Technology and Computer Studies, (Pp. 319-323). Faculty of Education, University of Ilorin, Ilorin, Nigeria.

Demirkol, M., & Kazu, I. Y. (2014). Effect of blended environment model on high school students' academic achievement. *The Turkish Online Journal of Educational Technology,* 13(1), 78–87.

Franzer, B.J., Okebukola, P. A. O. & Jegede, O. J. (1992). Assessment of the learning environment of Nigerian science laboratory classes. *Journal of Science Teacher Association, Nigeria.* Vol.27.

Onasanya, S. A., Adegbija, M. V., Olumorin, C. O. & Daramola, F. O. (2008). Education Reforms and Assessment of Teachers Competence in Instructional Media Technology use in Junior Secondary Schools in Kwara State. In R. A. Lawal (Eds.), Education Reforms in Nigeria- Past, Present and Future, (Pp. 259-272). Stirling-Horden Publishers Ltd., Lagos.

Onasanya, S. A. & Omosewo, E. O. (2011). Effect of Improvised and Standard Instructional Materials on Secondary School Students' Academic Performance in Physics in Ilorin, Nigeria. *Singapore Journal of Scientific Research, 1: 68-76.*

Wikipedia (2017). Realia objects (Education). Retrieved from, https://en.m.wikipedia.org>wiki> Realia.

Yusuf, M. O. (2011). Improved teacher education programme in Nigeria through information and communication technology. *Journal of Science, Technology, Mathematics Education, 8(1), 190-204.*