

Short Paper

Effect of Activity-Based Instructional Strategy on Secondary School Students' Interest in Computer Studies in Anambra State, Nigeria

JohnBosco O.C. Okekeokosisi
Computer Education,
Federal College of Education (Technical) Asaba, Delta State, Nigeria
gentlejack10@yahoo.com
(corresponding author)

Ebele C. Okigbo
Science Education,
Nnamdi Azikiwe University, Awka, Anambra State, Nigeria
ec.okigbo@unizik.edu.ng

Date received: January 11, 2021

Date received in revised form: April 17, 2021; April 26, 2021

Date accepted: May 1, 2021

Recommended citation:

Okekeokosisi, J. B. O. C., & Okigbo, E. C. (2021). Effect of activity-based instructional strategy on secondary school students' interest in computer studies in Anambra State, Nigeria. *Puissant – A Multidisciplinary Journal*, 2, 133-143.

Abstract

This study investigated the effect of activity-based instructional strategy (ABIS) on secondary school students' interest in computer studies. The study adopted a descriptive survey research design. A two-stage sampling procedure was used to sample 87 computer studies students from two schools out of 18 coeducational public schools in Awka South Local Government Area of Anambra State, Nigeria. Students offering computer studies from the two schools were randomly assigned to experimental and control groups respectively. Data were collected using Computer Studies Interest Scale (CSIS). The instruments were validated by three experts. The reliability of CSIS was established by a simple administration method using Cronbach Alpha with an index value of 0.65. The experimental group was taught computer studies using ABIS while the control group was taught using the conventional lecture method (CLM). Data were collected by administering CSIS on the participants as pre and post-test. The data obtained were analyzed using mean, Standard Deviation, and two-way Analysis of



Covariance. The findings revealed a significant difference in the mean interest rating scores of students exposed to ABIS and CLM in favor of the former group. There was no significant difference in the mean interest scores of male and female students exposed to ABIS. Based on the findings, the study recommended that computer studies teachers should adopt the use of ABIS in teaching computer studies. Training and recruitment of computer studies specialist teachers are a sine qua non towards realizing the goals of teaching computer studies.

Keywords – gender, activity-based instructional strategy (ABIS), interest, computer studies

INTRODUCTION

The need to produce functional individuals is the concern of all stakeholders in education. Today, educators, researchers, and curriculum planners emphasize functional education due to the effect of globalization and the increasing complexity of technology (Okekeokosisi, Anaekwe & Okeke, 2016). Computer studies are an aspect of vocational, science, and technological education (VSTE) which gears towards introducing individuals to the global world. Computer studies can be described as a subject that deals with the ways of representing objects and processes which include algorithmic processes, their principles, hardware and software designs, applications, and their impact on society. In Nigeria today, a computer is useful in solving life problems. As a school subject, it is of great value and an indispensable tool in various human endeavors. Computer studies have been described in diverse ways. Okonkwo (2012) described computer studies as a science of using electronic devices to develop applications that help to solve diverse human problems in every field of experiences be it in banking, transport, building, agriculture, education, and communication systems.

The importance of computer studies to individual citizens and the society at large has been emphasized. The Federal Republic of Nigeria (2013) in the National Policy on Education included computer studies as one of the vocational, science, and technological education (VSTE) in secondary school. It also stated the aims of computer studies to include; life-long learning, preparation for responsible citizens, and means of preparing for occupation in the world of work. These aims are in line with the United Nations Educational Science and Cultural Organization (UNESCO & Ilo, 2002) recommendation, that all vocational and technical education in the 21st century should be geared towards life-long learning. Besides, secondary school education prepares students for meaningful living in society as well as further education. According to Ekundayo (2010), the secondary school level is the bridge between the primary and tertiary levels. The underlining principle here is that secondary schools should be able to provide quality secondary education to all students.

The need to provide quality education made the National Council on Education (NCE, 2008) direct and reform Nigerian education to meet the context of National Economic and Development Strategies (NEEDS) and the Millennium Development Goals (MDGs). In line with this, the Nigerian Educational Research and Development Council (NERDC) (2008) reviewed the curriculum to expose the learners towards achieving the MDGs and the NEEDS. The NEEDS are summarized as values reorientation, poverty eradication, job creation, wealth generation, and using education to empower the people (Anaekwe & Ezechu, 2019). This action is to update and produce science, technology, and vocational education with relevant knowledge and skills for life-long learning.

The above-stated objectives notwithstanding, the interest of secondary school students in computer studies which is one of the vocational subjects is very discouraging. The evidence of this perception could be based on the frequent reports from science and vocation education researchers and examination bodies like WAEC, NECO, and NABTEB. The reports always indicate a lack of interest of learners in computer subjects and other related vocational subjects. Hence the study sought to examine how the effect of activity-based instructional strategy could stimulate students' interest in computer studies.

Activity-based instructional strategy (ABIS) can be described as hands-on, minds-on activity, or learning by doing. In the words, it means a strategy adopted by a teacher through activities employed by the teacher and the students to bring about efficient learning experiences. It is a child-centered approach and an educational term that describes how people learn through activities. According to Santosh (2012), ABIS means a teaching strategy that engages learners during instruction for amusement and achievement. According to Onwunyili and Onwunyili (2019), it provides information to be used as feedback to modify the teaching-learning process. It is a strategy that claims that learning should be based on doing some hands-on experiments and activities which could stimulate learners during instructional delivery. It equally encourages learners to integrate the information they learned into their everyday activities (Nnorom & Osuafor, 2019).

Interest is the willingness to acquire skills, knowledge, attitude, and values. It has been defined by different authors in different ways. Obodo (2002) defined interest as the attraction which forces or compels a child to respond to a particular stimulus. This points out the fact that a child develops an interest in an attractive and arousing stimulating environment. This means that the child is bound to pay attention as a lesson goes on if he is interested in that particular lesson. In other words, it shows that interest could be linked with the likes or dislikes of an individual learner which is associated with activities (Okoro, 2015). This statement refers to interest to be the positive state of mind or the standard that responds to the learning process. Interest could be seen as individual reactions, feelings, and impressions about a task or situation. Interest in a particular subject depends on the affective domain of the learners towards that subject. Gesell in Okonkwo (2012) stressed that a child is willing to learn when he/she has an interest and matured thinking in the teaching-learning process. It implies that the term interest is an

emotionally oriented behavioral trait that determines a students' urge and vigor to tackle educational programs or other activities. This underscores the need for strategies that enhance interest in science and technology lessons to both male and female students. Studies have shown that the major concern of teachers in developing countries including Nigeria, is how best to integrate facilities and various strategies in teaching and learning (Tella, Orim, Ibrahim &Memudu, 2017).

Gender has become a contemporary focus to most researchers because gender factors have a powerful effect on students' interest in teaching-learning process. Nworgu (2005) and Ukwungwu (2002) in Elejere, Omeke and Eze(2018) discovered that either gender disparity as it exists in the schools on the part of the student or the teacher has great influence on student performance. Student's performance has link with interest because when student's interest is simulated in a particular learning situation, the tendency is to be committed, and effective learning takes place. Over the years, gender phenomenon has been evaluated from different perspectives in terms of how they affect attitude of learners in teaching-learning process. Rapid sensitization and awareness creation suggested that most countries are experiencing great changes with respect to non-gender discrimination in the field of education. Hence, this study also intends to examine the effect of activity-based instructional strategy on students' interest and gender in computer studies.

STATEMENT OF THE PROBLEM

Computer studies as an aspect of VSTE subjects offered in the national curriculum are expected to be taught with a method that can spur students' interest. This will gear towards life-long learning, preparation for responsible citizens, and means of preparing for occupation in the world of work. Unfortunately, frequent reports from science and vocation education researchers and examination bodies like WAEC, NECO, and NABTEB always indicate a lack of interest of learners in computer subjects and other related vocational subjects. Researchers attributed to lack of interest to several issues, including teacher's method of teaching hence the justification for the present research.

PURPOSE OF THE STUDY

The purpose of the study was to investigate the effect of activity-based instructional strategy (ABIS) on secondary school students' interest in computer studies. Specifically, the study determined the

1. difference in the mean interest scores of students taught computer studies using ABIS and those taught with conventional lecture method (CLM),
2. difference in the mean interest rating scores of male and female students taught computer studies using ABIS, and
3. interaction effect of gender and teaching method on students' interest in computer studies.

RESEARCH QUESTIONS

The study sought to provide answers to the following questions.

1. What is the difference between the mean interest rating scores of students taught computer studies using ABIS and those taught using CLM?
2. What is the difference between the mean interest rating scores of male and female students taught computer studies using ABIS?
3. What is the interaction effect of gender and teaching method on students' interest in computer studies?

HYPOTHESES

The following null hypotheses were tested at a 0.05 level of significance.

1. There is no significant difference in the mean interest rating scores of students taught computer studies using ABIS and those taught using CLM.
2. There is no significant difference in the mean interest rating scores of male and female students who taught computer studies using ABIS.
3. There is no interaction effect of gender and teaching methods on students' interest scores in computer studies.

METHOD

The study adopted a descriptive survey research design specifically, the pretest-posttest non-equivalent control group was used. The study was carried out in Awka South Local Government Area (LGA) of Anambra State, Nigeria. The population of the study is made up of 2250 senior secondary two (SS2) students in public co-educational secondary schools in the study area (PPSSC, Awka, 2019). The co-educational secondary schools were used because among 18 public secondary schools in Awka South, only three secondary schools are single-sex schools (one boys' school and two girls' schools) while 15 secondary schools are co-educational.

The total sample size of the study is 87 computer studies students were used. A purposive sampling technique was employed to select only five public co-educational secondary schools in Awka South LGA. This is because only five schools offer computer studies in external examination in the area. A simple random sampling technique (balloting with replacement) was used to sample two out of the five public co-educational secondary schools. The researchers chose SS2 computer studies students from the two schools. The choice of SS2 computer studies students was based on the fact that they have been exposed to the subject for almost two years and have chosen to offer computer studies in WASSCE. Besides, they were not involved in any external examination as is it was the case with the SS3 students. Students offering computer studies from the two schools were randomly assigned to experimental and control groups respectively using a flip of a coin.

Data relevant for the study were collated using the Computer Studies Interest Scale (CSIS) which was made up of 15 items. The instrument was constructed by the researchers and rated on a 4-point scale as strongly agree (4points), agree (3points), disagree (2points), strongly disagree (1 point). The instrument was subjected to validation by experts in science education and educational psychology. The instrument was validated in terms of clarity of instruction, proper wordings of the items, appropriateness, and adequacy of the items in addressing the purposes. The validated instrument can be seen as attached in Appendix A. The reliability of CSIS was calculated using Cronbach's alpha for internal consistency and their reliability was established as 0.65.

Before the teaching commenced, the researchers trained their regular computer studies teachers from experimental and control schools with their lesson plans for one week on how to use ABIS as research assistant using the following features respectively; simulation, scaffolding, problem-solving, adaptation, collaboration, and evaluation (experimental lesson plan), telling, recitation, memorization and narrating (control lesson plan).

After the research assistant training, a pretest was administered to learners in the sampled schools by the research assistants. Only the experimental group was taught computer hardware using ABIS. The question papers were retrieved from the research subjects since the items in the pretest were re-organized and used as post-test.

The treatment lasted for four weeks, the post-test was administered to both the control and experimental groups. The research questions were answered using mean and standard deviation while the hypotheses were tested at 0.05 level of significance using analysis of covariance. In taking a decision, reject the null hypothesis if the probability value (P-value) is less than or equal to the significant value of 0.05 ($P \leq 0.05$); otherwise, do not reject the hypothesis.

RESULTS

Results were presented in tables according to research questions and hypotheses.

Research Question 1: What is the difference between the mean interest rating scores of students taught computer studies using ABIS and those taught using CLM?

Table 1. The difference in the Mean Interest Rating Scores of Students taught Computer Studies using Activity-based Instructional Strategy (ABIS) and Conventional Method (CM)

Groups	N	Pretest		Posttest		Mean gain
		Mean	SD	Mean	SD	
Experimental	35	28.60	7.99	56.4	5.78	27.86
Control	52	23.58	11.23	43.38	10.55	19.80
Mean Differences		5.02		13.08		8.06

From Table 1, the difference in the mean interest rating scores of SS2 students' taught computer studies with ABIS and CLM is 8.06. However, the standard deviation scores in both pretest and post-test of the students' scores in the experimental group are less in each case and therefore more homogeneous than that those in the control group. The SD posttest also shows that the treatment with ABIS was able to bring the participant scores closer than before the treatment.

Research Question 2: What is the difference between the mean interest rating scores of male and female students taught computer studies using ABIS?

Table 2. The difference in the Mean Interest Scores of Male and Female students taught Computer Studies using ABIS

Groups	N	Pretest		Posttest		Mean gain
		Mean	SD	Mean	SD	
Male	14	26.79	5.95	57.50	6.45	30.71
Female	21	29.81	9.03	55.76	5.33	25.95
Mean Differences		-3.02		1.74		4.76

Table 2, the difference in the mean interest rating scores of male and female students who taught computer studies using ABIS is 4.76. The standard deviation in both pretest and post-test of the students' scores in the experimental group is less in each case and therefore more homogeneous than that of those in the control group. The SD posttest also shows that the treatment with ABIS was able to bring the participant scores closer than before the treatment.

H₀: There is no significant difference in the mean interest scores of students taught computer studies using ABIS and the conventional method.

Table 3. Summary of Two-way Analysis of Covariance Test for Significant Difference in the MeanInterestRating Scores of Students taught Computer Studies with ABIS and CM

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	4183.097 ^a	4	1045.774	13.825	.000
Intercept	20662.956	1	20662.956	273.158	.000
Pretest	561.152	1	561.152	7.418	.008
Method	2667.078	1	2667.078	35.258	.000
Gender	79.130	1	79.130	1.046	.309
Method *gender	5.300	1	5.300	.070	.792
Error	6202.857	82	75.645		
Total	216246.000	87			
Corrected Total	10385.954	86			

R Square = .403 (Adjusted R Squared = .374)

Table 3 showed that there is a significant main effect of ABIS on students' interest in computer studies, $F(1,86) = 35.258, p < .0001$. The null hypothesis, therefore, is rejected pointing that there is a significant difference between the mean interest scores of students exposed to ABIS and those exposed to CLM. The difference was in favor of the students who were exposed to ABIS.

Ho₂: There is no significant difference in the mean interest scores of male and female students taught computer studies using ABIS.

Table 4. Summary of Two-way Analysis of Covariance Test for Significant Difference in the Mean Interest Scores of Male and Female Students taught Computer Studies using ABIS

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	54.175 ^a	2	27.088	.802	.457
Intercept	6894.462	1	6894.462	204.184	.000
Pretest	28.799	1	28.799	.853	.363
Gender	35.487	1	35.487	1.051	.313
Error	1080.510	32	33.766		
Total	112694.000	35			
Corrected Total	1134.686	34			

a. R Squared = .048 (*Adjusted R Squared* = .012)

Data in Table 4 indicated non main effect of gender on students' interest in computer studies, $F(1,34) = 1.051, p = .313$. The null hypothesis is therefore not rejected, showing that there is no significant differences in students' mean interest scores in computer studies by gender.

Ho₃: There is no interaction effect of gender and teaching methods on students' interest scores in computer studies.

The data in Table 3 indicated non-interaction of gender and teaching methods on students' interest scores in computer studies, $F(1,86) = 0.070, p < .792$. The null hypothesis is therefore not rejected. Hence, there is no interaction effect of gender and teaching methods on students' interest rating scores in computer studies.

DISCUSSION

The findings of this study concerning the mean interest rating scores of students in computer studies are shown in Table 1. The result revealed that the mean gain of the experimental group is 27.86 and their SD in the pretest and post-test is 7.99 and 5.78 respectively. Hence, the difference between the mean interest scores of students taught

computer studies using activity-based instructional strategy (ABIS) and those taught with the conventional method (CLM) is 8.06. To if the difference in the mean interest scores between the groups was significant or not, a Two-way analysis of covariance was used which showed a significant mean effect of ABIS on students' interest in computer studies. The students' interest might have been aroused by diverse learning activities that challenged the students. This is supported by several researchers; Okoro (2015) investigated the effect of ABIS on students' achievement and interest in biology. The findings of the study revealed that experimental group expressed higher level of interest in learning biology than the control group. The reason for higher mean interest of students could be that the learners were more committed and therefore were carried along during instructional process. It could also be as a result of excitement over the new strategy that appealed to their various senses of learning. The bridging of gap from abstract knowledge to more concrete and actual participation provided the students in experimental group to have high mean interest scores than the students in the control group. The aforementioned findings gave credence to the finding of Oluwatosin & Ogbeba (2018). Oluwatosin's study showed that students taught organic chemistry using hands-on activity-based had higher mean interest scores than those students taught organic chemistry with discussion method. Thus, the higher interest scores obtained by the students' taught organic chemistry as portrayed by Oluwatosin's study could be attributed to hands-on activity-based employed by the teachers during the teaching-learning process.

Another finding from this study is that there was no significant difference in the mean interest scores of male and female students who taught computer studies using ABIS. The result x-rayed that the mean gain is 4.76 with an SD of 5.95 male, 9.03 for female in their pretest scores. SD posttest scores for both male and female students are 6.45 and 5.33 respectively. To find out if the difference in the mean gender interest scores is significant or not, a two-way analysis of covariance was used. The findings of the study revealed that there was no significant difference in students' means interest scores in computer studies by gender. Furthermore, the result of this study revealed non-significant interaction effect of method and gender on students' interest scores in computer studies.

CONCLUSION

Based on the findings and discussions, it was concluded that teachers should provide an activity-oriented instructional strategy in the instructional process since it spurs learners' interest. This implies that activity-based instruction is a gender-friendly strategy that can be used to teach and stimulate male and female computer studies students.

Hence, the study recommended that Computer studies teachers should adopt the use of ABIS in teaching computer studies in secondary schools. Government should train and recruit computer studies specialist teachers which is a *sin qua non* towards realizing the goals of teaching computer studies and VSTE related courses. Scholarships should be

awarded by Government and philanthropists to teacher-trainees who are pursuing programs in computer studies and VSTE related courses. Curriculum planners should emphasize more on the use of ABIS in teaching and learning computer studies to popularize its' use among teachers.

ACKNOWLEDGEMENT

The authors appreciate all those whose materials are used as resource materials in this write-up.

REFERENCES

- Anaekwe, M.C &Ezeuchu, M.C. (2019). Challenges of teaching basic science and technology (BST)in Nigerian public schools: a case of Anambra State. *South Eastern Journal of Research and Sustainable Development (SEJRSD)*, 2(1), 1-15
- Ekundayo, J. (2010). Achievement goals in the classroom: Students' learning strategies and motivation process. *Journal of Educational Psychology*, 80 (2), 260-267.
- Elejere, U.C, Omeke, N.E &Eze, C.C. (2018).Analysis of gender disparity in students' performance in mathematics and physics in West African senior school certificate examination.*African Journal of Science, Technology and Mathematics Education (AJSTME)*, 4(1), 25-29.
- Federal Republic of Nigeria. (2013).*National policy on education*. (6th Ed.).Yaba: NERDC Press.
- NCE. (2008).*Minimum standard for national colleges of education teachers*. Abuja: National Commission for Colleges of Education.
- Nigerian Educational Research and Development Council (NERDC). (2008).*The 9-year basic education curriculum at glance*.Lagos: NERDC Press.
- Nworgu, B. G. (2005). *Educational Research: Basic Issues and Methodology (2nd edition)*. Ibadan: Wisdom Publishers Limited Nigeria.
- Okekeokosisi, J.O.C, Anaekwe, M.C ., &Okeke, C.N.A (2016).Challenges of implementing ICT national curriculum in secondary schools in Anambra State.*Unizik Journal of Education Graduates*, 3(1), 89-103.
- Okonkwo, A. (2012). *Effect of computer-assisted instruction on students' acquisition of science process skills and interest in biology*. A research project presented to the Faculty of Education, University of Nigeria, Nsukka.
- Okoro, E.C. (2015). *Effect of Activity-based instructional strategy on students' achievement and interest in biology*.A research project.Faculty of Education, University of Nigeria, Nsukka.
- Oluwatosin, V.A & Ogbeba, J. (2018). Effects of hands-on activity-based and demonstration methods on secondary students achievement in physical chemistry. *Journal of Educational Studies*, 16, 521-533.
- Onwunyili, F.C &Onwunyili, M.C. (2019).Assessment of classroom teachers' feedback in formative tests. *South Eastern Journal of Research and Sustainable Development (SEJRSD)*, 2(1), 166-181.

Santosh, N.R. (2012). Activity-based learning an effective model for business schools. *Journal of Commerce*, 4 (91), 17-22.

Ukwungwu, J. O. (2002) Gender Differences Study of Performance in Integrated Science. A Summary of Studies Conducted in Nigeria. *Journal of Science Teachers Association of Nigeria*, 37 (1-2), 55-59

UNESCO & ILO, C. (2002). *Technical and vocational education and training for the twenty-first century*. Francis: UNESCO printing press.

Appendix A

Computer Studies Interest Scale (CSIS)

SCHOOL: -----

STUDENT'S NAME: -----

CLASS: -----

GENDER: -----

INSTRUCTIONS: Indicate your degree of agreement by ticking (v) only.

Please do not tick in more than one column each time.

S/N	ITEMS	SA	A	D	SD
1	Engaging with a computer during instruction makes me angry				
2	I hate social interaction when computer studies teaching-learning is going on				
3	It is enjoyable for me to learn new things in computer studies when taught in a passionate environment				
4	My interest in computer studies will increase if the lesson is activity-oriented				
5	Computer studies lesson are more exciting when the students do not ask questions during the teaching/learning process				
6	I think critically when given problems to solve in computer studies				
7	It is a very hard task to participate in any kind of instruction that includes activity-based				
8	I can learn computer studies effectively when motivated				
9	I do not want to stop learning computer studies when I am motivated by the engagement process				
10	Computer studies taught with learning activities are boring				
11	It is not interesting to solve problems on computer studies using a collaborative learning technique				
12	A collaborative learning classroom makes me acquire more skills in computer studies				
13	I am happy whenever I feel and touch computer hardware components				
14	It is stressful to learn computer studies when interactive play is going on in the classroom				
15	When taught with interactive play, it increases my mental capacity				