

INSTRUCTIONAL SCAFFOLDING AS AN ENHANCER OF STUDENTS' ACHIEVEMENT IN COMPUTER STUDIES IN ABAKALIKI EDUCATION ZONE OF EBONYI STATE

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ABSTRACT

The need to enhance the teaching and learning of key subjects in the nation's curricula for sustainable development has led to the present study of using instructional scaffolding as an enhancer of students' achievement in Computer Studies in Ebonyi State. One research question and one hypothesis guided the study. The design of the study was a quasi-experiment design of pre-test, post-test, non-equivalent control group. The population of the study was 7,251 Upper Basic 2 students and with the use of Random Sampling Technique, a sample size of 120 was drawn; 70 for the treatment group and 50 for the control group. The instrument for data collection was a Computer Studies Achievement Test (CSAT) that was duly validated and its reliability determined with a co-efficient of 0.97 using Kuder Richardson Formula 20 instrument. The instrument was administered both to the experimental and control groups with initial pre-test and post-test at the end of six weeks. The data collected were analyzed using mean, standard deviation and ANCOVA. The study findings showed that those taught using instructional scaffolding had means higher than those of the control group taught with expository method - 59.97 and 46.68 respectively. Further test using ANCOVA showed a significant difference in the two means (0.094) at Alpha level of 0.05 significance, leading to the rejection of the null hypothesis. Implications of the study were drawn and recommendations made that teachers need to be retrained in the use of instructional scaffolding for better performance of students among others.

Keywords: Scaffolding, Enhancer, Students' achievement, Computer Studies, Ebonyi State.

Introduction

Education empowers its recipients with the appropriate skills, knowledge and values to adapt and contribute effectively in national development. In line with these expectations, the Federal Government of Nigeria in its National Policy on Education (FRN, 2014) reiterated that education is a veritable tool for national development; hence she has made giant strides to key in into global programmes to enhance its human and material resources.

To actualize the purpose of education according to Asim (2018), curriculum contents needs to be properly developed and delivered to the learners in a way to sustain their interest to enhance education for life. The expectation of any nation are packaged in subjects' curricula for onward transmission to the citizens at various levels of education. Curriculum then is the instrument by which schools seek to translate the hope of the society. It is a systematic tool designed to educate young persons in order to positively influence their all-round self-development and the world around them (Amechi, Akunna & Ekezie, 2020); hence the need for proper curriculum implementation.

Curriculum implementation according to Akujobi and Onyechere (2016:1) "is putting into practice of planned curriculum which takes place in the classroom involving the interaction between teachers, learners, curriculum materials and content to attain the educational goals". It then means that curriculum implementation is a cooperative efforts to see that a planned curriculum is properly delivered to the learners for their overall development. The present study focuses on appropriate way of implementing Computer Studies curriculum to enhance students' interest in science and technology education in Ebonyi State.

Computer science education is very vital in the development of any society and no nation can develop effectively without embracing computer technology as the world is experiencing quick innovations with its applications. Ifeanyi as cited in Maduagwu (2021) emphasized that computer as a component of modern information technology is considered a veritable tool in educational technology as it has the ability to process large data very fast using high speed operation and stores huge amount of data/information which is retrievable when needed. It is popularly considered as a human machine that can rescue man from exhaustive energy; hence the need to introduce this special machine to our youths early enough in the teaching-learning process for their all-round development.

Computer studies education was introduced into the Nigerian secondary education in 1988 with the aim of exposing students to computer applications so that they can use it to solve emerging problems which can make them become marketable in the acquisition of various skills for life existence (Mofa as cited in Maduagwu, 2021). Despite the loaded benefits of this subject in the education process, students in Nigerian secondary schools seem not to perform well in the subject in the past 6 years. As exciting as it is to use computer to work and play, students' performance in the subject in examination situation is poor and this is worrisome which has led to the present study on how the innovative method of scaffolding can be used to enhance their performance in Computer studies.

Scaffolding is an instructional strategy which is often used in teaching new skills by engaging students collaboratively in tasks that are difficult to achieve on their own without assistance. Its effectiveness as a teaching method has been explored in developed countries, but it is yet to be

fully utilized in the Nigerian classrooms. The method of scaffolding mimics the building pattern in civil engineering where scaffolds are constructed (wood-works) to enable the builders stand firm to lay blocks or other important construction materials at the upper level of a building (Samuel, 2016). In the learning process, it serves as a good support or framework for students to learn better and faster. According to Nwani and Oteh (2023), scaffolding provides contextual support for learners that can involve presentation of a video or the use of still pictures during class interactions which helps the students to understand what they are learning. The authors emphasized that the teachers in the process of presenting the content asks relevant questions that capture students' attention at the end. They are grouped in manageable sizes to discuss their observations and practice the involvements in the actual lesson content.

Two basic functions of scaffolding according to Samuel (2016) is to help groom the learners in their area of weakness which they cannot manage themselves and to enable them to try to learn on their own without the aid of an instructor. In line with this, Collins, Brown, and Holun cited in Nwani and Oteh (2023) outlined the basic steps of scaffolding for learners thus: (i) Start by building on what the learners already know (ii) Add more details and information over a period of time (iii) Allow the learners to perform on their own (iv) Afterwards in the fading process, begin by slowly removing the support in order to give the learners more responsibility. This is a laudable approach in the teaching-learning process as emphasis is on consolidation on what the learners know and building gradually on it. Therefore, the present study examined how instructional scaffolding enhances students' achievement in Computer studies in Abakaliki Education Zone of Ebonyi State.

One research question and one hypothesis guided the study thus:

1. What is the difference in the mean scores of students taught computer studies using instructional scaffolding strategy and those taught using expository method?

H01: There is no significant difference in the mean achievement scores of students taught using instructional scaffolding strategy and those taught using expository method.

Method

The study employed quasi-experimental design; specifically, it was pre-test, post-test, non-equivalent control group design involving treatment and control groups for the study. The area of the study is Abakaliki Education Zone of Ebonyi State with four Local Government Areas namely: Abakaliki, Izzi, Ohaukwu and Ebonyi. The choice of the area is based on the fact that it is hosting the State Capital Territory with dominant public secondary schools, some of which have been mapped out as model schools that have been specially equipped with modern facilities.

The population of the study was 7,251 Upper Basic (UBS II) students. With the use of Random Sampling Technique, a sample size of 120 was drawn; 70 students from intact class were involved in the treatment group and 50 students for the control group.

The instrument for data collection was 30-item Computer Students' Achievement Test (CSAT) that covered a large content area that was duly validated by three experts and its reliability determined by using Kuder Richardson Formula 20 procedure. It yielded a reliability coefficient of 0.97, indicating that it was reliable for the study.

The computer teachers in the selected schools were briefed on the study procedure and those in the treatment group were further trained on the use of instructional scaffolding strategy. The CSAT test was administered to both groups before the commencement of teaching for the treatment group. The initial score obtained before treatment was the pre-test, while the score obtained after treatment for six months was the post-test for that group to determine their performance. The data collected were analyzed using mean, standard deviation to answer the research question and Analysis of Co-Variance (ANCOVA) to test the null hypothesis at 0.05 level of significance.

Result

Table 1: Mean achievement scores of students taught using expository and scaffolding methods with differences in their pre and post tests

Method	No.	Pretest of CSAT	Posttest of CSAT	Mean(X) gain of CSAT scores
Instructional scaffolding method	70	19.37	72.34	52.97
Expository method	50	22.37	69.64	46.68

The result in Table 1 is the pre-test and post-test of scaffolding and expository methods of instruction. Instructional scaffolding pre-test was 19.37 and its post-test recorded 72.34 with a mean gain of 52.97. On the other hand, students taught using the expository method had an initial pre-test of 22.37 and 69.64 post-test with a mean gain score of 46.68. So there is a mean difference in the students' scores based on the two methods with instructional scaffolding recording higher score.

Table 2: Analysis of Covariance-test on the mean achievement scores of students taught using expository and scaffolding methods

Source of variation	Sum of square	df	Mean (X) sum of square	f-cal	Sig.
Corrected model	432.801	4	108.200	1.982	0.102
Intercept	57672.213	1	57672.213	1056.680	0.000
Pretest	66.853	1	66.853	1.225	0.271
Method	155.691	1	155.691	2.853	0.094

Table 2 presents the test of significance difference using ANCOVA test at 0.05 level of significance. The result showed that the f value of 0.094 was greater than 0.05 alpha level. Based on the decision rule, the null hypothesis is rejected as there is a significant difference in the mean achievement scores of students taught Computer studies using instructional scaffolding and those taught using the conventional method.

Discussion

Table 1 presents the mean gains scores of 52.97 and 46.68 for scaffolding instructional strategy and conventional method respectively after treatment. It is obvious that the students exposed to scaffolding strategies had enhanced achievement scores showing the efficacy of the method: This is in line with the view of Larkin as cited in Maduagwu (2021) that scaffolding instructional strategy is one of the method that is effective for teachers' use that can accommodate individual students' needs. The finding also confirmed the stand point of Nwani and Oteh (2023) that scaffolding method exposes learners to step by step procedure of learning a given content in an exciting way for better performance.

Table 2 is the ANCOVA test of no significant difference in the mean achievement scores of students exposed to the two methods. It revealed that the f value of 0.094 was greater than 0.05 alpha level of significance. This implies that there was a significant difference between the mean scores of students exposed to both methods in favour of scaffolding strategy; so the null hypothesis was rejected because of the significant difference. The benefit of scaffolding method on students' achievement in Computer studies in this study further buttressed the observation of Samuel (2016) that the strategy helps to groom the learners in their areas of weakness and helps them to learn on their own; hence the higher achievement means recorded. The finding is re-echoed by the position of Obiekwe (2016) when he emphasized that scaffolding helps learners to collect and organize available information with focused attention that leads to better achievement.

There are obvious implications of the study thus:

That scaffolding instructional strategy is effective in the teaching and learning of Computer studies.

The performance of students exposed to the expository method points to the need of de-emphasizing teacher centred methods in schools.

Majority of teachers in Ebonyi State school system are yet to update their knowledge in the use of effective methods like scaffolding in the teaching-learning process.

Conclusion

The study examined how instructional scaffolding enhances students' achievement in Computer studies in Abakaliki Education Zone of Ebonyi State. The findings revealed that there was an enhanced mean achievement scores for students exposed to scaffolding method compared to those exposed to the normal lecture method. Again, the ANOVA test based on the mean scores of students exposed to both methods showed a significant difference in favour of mean scores of those exposed to instructional scaffolding as seen in Table 2. The null hypothesis for the study was then rejected because there was a significant difference in the mean scores of the two methods. It now implies that instructional scaffolding can be used to enhance the achievement scores of students in Computer studies.

Recommendations

Based on the findings of the study and the implications drawn, the following recommendations were made:

- (1) The Ebonyi State Government should implement the use of instructional scaffolding as a major teaching method in the school system.
- (2) The state government should organize workshops and seminars to re-train teachers on the use of innovative methods like scaffolding strategy.
- (3) Ebonyi State government should re-equip schools in the state with state of the art facilities that will enhance the use of instructional scaffolding effectively.
- (4) At the Federal level, teacher training packages should include among others, instructional scaffolding method in the training of teachers in Nigeria to equip them better for good delivery of their course contents.

References

- Akujobi, C.N. and Onyechere U.D. (2016). Effective curriculum implementation: A tool for achieving sustainable secondary education. A paper presented at the 11th Biennial Conference of WCCI, Nigeria Chapter held at Imo State University, Owerri from 19th to 22nd October.
- Amechi, A.N; Akunna, C.O. and Ekezie, M.S. (2020). Curriculum an effective tool for corruption-free society. *Interdisciplinary Journal of Gender and Women Development Studies*, 3(5), 182-193.
- Asim, A.E. (2018). Beyond gender fairness in curriculum development: What and what should be. A paper presented at the 12th Biennial Seminar of WCCI-Nigeria Chapter held at the University of Calabar on 19/10/2017.
- Federal Republic of Nigeria (2014). National Policy on Education. Lagos: NERDC Press.
- Maduagwu, U.M. (2021). Effects of instructional scaffolding on students' achievement in Computer studies in upper basic schools in Abakaliki Education Zone. Unpublished Ph.D Thesis, Ebonyi State University, Abakaliki.
- Nwani, N. and Oteh, J.E. (2023). Curriculum and instruction for colleges and universities. Abakaliki: Ebonyi State College of Education Press Ltd.
- Samuel, O.C. (2016). Effects of scaffolding on students' performance in secondary school students' achievement in Business Education in Anambra State. Unpublished Ph.D. Thesis, Anambra State University, Uli.
- Obiekwe, U.G. (2016). Effects of scaffolding and literature circle instructional strategies in students' achievement in Business education in Junior Secondary Schools in Orumba North LGA. Unpublished Ph.D. Thesis, Anambra State University, Uli.

Appendix: Bank Deposit Slip Document

Bank: FirstBank (Since 1894)

Tran Date: 05/06/2024

Value Date: 05-06-2024

Tran Id: M158975 | **Teller ID:** IN043518

Branch Name: ABAKALIKI BRANCH

Account No: 2023543515

Account Name: WORLD COUNCIL FOR CURRICULUM AND INSTRUCTION

Depositor Name / Description: PROF. NNENNA O. EMESINI

Amount: 25,000.00 NGN (Twenty Five Thousand Naira Only)

Depositor's Signature: Okemesini