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Research Paper

Effects Of E-Learning Instructional Strategy on National Teachers' Institute Integrated Science Students' Achievement in North Central Nigeria

APOCHI, Maria Aladi; ORJI, Nwokedirioha Oyemaechi and SULEIMAN, Muhammed Baba
Department of Science and Environmental Education, Faculty of Education, University of Abuja, Abuja Nigeria
Corresponding Author: SULEIMAN, Muhammed Baba

ABSTRACT
In the paper the effects of e-learning instructional strategy on National Teachers' Institute integrated science students' achievement in north central Nigeria. The study used Quasi-experimental control group design. A total of 78 students formed the sample size of the study from population of 179 students. Purposive sampling technique was used for choosing the centres used for the study. The findings include that there was significant difference in achievement, mean rank score students taught with e-learning instructional strategy and those taught with conventional method, a positive change in achievement towards integrated science was also observed amongst the experimental group. It was then recommended that NTI lecturers should adapt e-learning instructional strategy for the teaching of integrated science; lecturers should be trained on how to use e-Learning Instructional Strategy. Based on these findings of the study, it was concluded that students exposed to e-Learning instructional strategy achieved higher academically, retained concepts taught better and exhibited a more positive achievement towards integrated science than their counter parts exposed to the lecture method.

KEYWORDS: *e-learning instructional strategy, Integrated Science Students, Achievement, National Teachers' Institute, Bachelor Degree Programme, North Central Nigeria.*

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I. INTRODUCTION

E-learning is bridging gaps in access, modernizing teaching and learning, and equipping students with the digital competencies required for competitiveness. Beyond the classroom, the impact of e-learning extends into the nation's economic and societal ambitions. It supports workforce development, reduces educational inequality, encourages creativity and entrepreneurship, and strengthens Nigeria's capacity to compete in a knowledge-driven economy. According to Wilson (2020), e-learning Instructional strategy are categorized into six models, which include live session; where the lecturer drives the instruction augments it with digital tools and it encourages educators to include technology into the classroom under certain conditions. Rotation model; requires that students switch between a traditional classroom and e-learning as determined by pre-arranged meetings.

It has been observed that most Integrated Science Lecturers in Nigerian institutions predominately use the conventional method in teaching science due to poor knowledge and none exposure to other learner-centered methods of teaching and this led to poor achievement and retention (Ayuba, 2020). In addition, experience by the researcher shows that the status of Integrated science classroom activities in North Central Nigeria are still dominated by teacher – centered methods of teaching, such as the lecture method, which is found to be in effective in promoting meaningful learning.

Numerous activity-based teaching methodologies always to improve the teaching and learning of integrated science because of the drawbacks of the conventional teaching approach. To overcome the problem of teaching and learning Integrated Science, some scholars advocated the use of multimedia inform of both learning using face-face and e-learning resources in teaching and learning (Thomas & Israel, 2017). Thus, this

study used conventional interaction and e-learning instructional strategy such as (LMS) Learning Management System in teaching Integrated Science concepts. However, e-learning has a variety of drawbacks, including poor technical accessibility that could waste resources. Poor internet connectivity and expensive maintenance costs are examples of technical issues. Lecturers may find e-learning difficult since it necessitates planning time and evaluation time. Using e-learning strategy (LMS) in the classrooms has various advantages for lecturers, including more convenient teaching resource storage, greater communication, and freedom to roam around the classroom with the resource materials (Tuma, 2021).

Achievement is an important academic factor that has been identified as being influence by teaching methods. As defined by Chavarría et al., (2019), achievement is the quality of activities or their outcomes as evaluated by some standard of excellence. Achievement is measure by how consistently a student performs on tests or evaluations when compared to students in the same class. The grade or test that a student receives reflects how consistently they achieved in a given test (Ginga et al., 2019). Achievement is the attainment of academic objectives, the educational results of pupils, or more specifically, the degree to which a student, a teacher, or an instructor has attained the stated educational objectives. Consequently, different situations and teaching methods influence students in an array of ways such as level of achievement and academic retention.

The fact that e-learning instructional strategy could influence learning outcomes achievement in Integrated Science concepts, this work, therefore, sets out to investigate the effects of e-learning instructional strategy on NTI integrated science students' attitude, achievement and retention in north central Nigeria.

II. PURPOSE OF RESEARCH

i. find out the effects of e-Learning instructional strategy and conventional method in NTI Integrated Science students' retention in North Central Nigeria;
ii. determine the effects of e-Learning instructional strategy and conventional method on the NTI Integrated Science students' achievement in North Central Nigeria.

III. RESEARCH QUESTIONS

1. What is the difference between the mean achievement scores of NTI students' taught Integrated Science concepts using e-learning instructional strategy and those taught with conventional method?
2. What is the difference between the mean achievement scores of male and female NTI students' taught Integrated Science concepts using e-learning instructional strategy?

IV. HYPOTHESIS

Ho_1: There is no significant difference the mean achievement scores of NTI students taught Integrated Science concepts using e-learning instructional strategy and those taught Integrated Science concepts with conventional method.

Ho_2: There is no significant difference the mean achievement scores between male and female NTI students taught Integrated Science concepts using e-learning instructional strategy.

V. BACKGROUND OF LITERATURE

The reviewed related literature on the research gave direction to the study. Zare, et al., (2016) carried out study on impact of e-learning on university students' academic achievement and creativity at the Payame Noor University of Hamedan, Iran. The research design is descriptive survey. The population of the study was 100 biology students and sample size of 40 students. Two instruments were used for data collection; they are: developed test on the Introduction to biology course and the Abedi Inventory for assessing creativity. The differences between the reviewed work and current research are the reviewed work took place at Payame Noor University of Hamedan, Iran while the current work is taking place at NTI in North Central, Nigeria the reviewed work on achievement, the reviewed work has the population of 100 while the current work has population of 179 students, the reviewed work is in biology while the current work is in integrated science and the reviewed did not have moderating variable of gender while the current work has gender as moderating variable.

Adebayo et al., (2016) carried out a study on effects of e-learning simulation instructional strategy on biology students' academic achievement in DNA replication and transcription in Michael Otedola College of Primary Education, Epe affiliated to Ekiti State University. Quasi-experimental control group design was used for the study. The differences between the reviewed work and current are the reviewed work took place at Ekiti State University while the current work is taking place at NTI in North Central, the reviewed work had achievement, the reviewed work is in biology while the current work is in integrated science and the reviewed did not have moderating variable of gender while the current work has gender as moderating variable.

Nisreen, (2016) Carried out a research on effectiveness of e-learning learning in improving students' achievement in the third grade's science in the traditional method. The study sample consisted of (108) male and

female students, who were divided into two groups: experimental and control. The differences between the reviewed work and current are the reviewed work had achievement, the reviewed work has the population of 108 while the current work has population of 179 students, the reviewed work is in third grade's while the current work is in integrated science and the reviewed did not have moderating variable of gender while the current work has gender as moderating variable.

VI. METHODOLOGY

This study adopted a quasi-experimental research design, as proposed by Kerlinger (1973). Specifically, the non-randomized pretest–posttest control group design was used. As an experimental design, the sampled population was divided into experimental and control groups. The target population of this study was composed of all the National Teacher's Institute Bachelor Degree Programme (BDPs) Study Centres in North central Nigeria. The target population of this study constitutes one hundred and seventy nine (179) students, in which seventy two were males (72) and one hundred and seven are females (107) in the thirty three (33) study centres in North Central Nigeria (National Teacher's Institute, 2024). The choice of 78 students as a sample size of this study are in line with central limit theorem, which recommended minimum of thirty (30) sample size as noted by Tucman (1975). Integrated Science Achievement Test (ISAT). ISAQ was adapted from Students' in order to ensure the content and face validation, the draft copies of the instruments were submitted to the two supervisors for proper scrutiny, to ascertain the validity of the instruments. The data collected were analyzed using Statistical Package for Social Sciences (SPSS) 2.0 package. Both descriptive and inferential statistic was used to analyze the data. The research was answered using mean rank while research questions 1 and 2 using mean and standard deviation. The hypotheses were tested using t-test and ANCOVA, with the aid of SPSS package at $P \leq 0.05$ significant level.

VII. RESULTS

Results of Achievement Scores of NTI Students Taught Integrated Science Concepts Using E-Learning Instructional Strategy and Those Taught with Conventional Method

Source	Type III Sum of Squares	df	Mean Square	F	Sig.@0.05
Corrected Model	8027.241[a]	4	2006.810	31.086	0.000
Intercept	12825.450	1	12825.450	198.670	0.000
Achieve Pretest	24.167	1	24.167	0.374	0.543
Group	7774.670	1	7774.670	120.432	0.000
Gender	0.742	1	0.742	0.011	0.915
Group * Gender	119.292	1	119.292	1.848	0.178
Error	4712.625	73	64.557		
Total	360045.494	78			
Corrected Total	12739.867	77			

Sig. at $p \leq 0.05$ Dependent Variable: ACHIEVEMENT

Table shows the ANCOVA result of achievement scores of NTI students taught Integrated Science concepts using e-learning instructional strategy and those taught with conventional method. From the table 11, there is significant difference in achievement in Integrated Science concepts among the groups based on methods; F (1, 73) = 120.432, and p= 0.000, which is less than 0.05 level of significance. Therefore, hypothesis three is rejected as it can be concluded that methods of teaching the groups have significant impacts on the achievement scores of NTI students in learning Integrated Science concepts in favour of the group taught with e-leaning instructional strategy.

Results of Achievement Scores of Male and Female NTI Students Taught Integrated Science Concepts Using E-Learning

	Source	Type III Sum of Squares	df	Mean Square	F	Sig.@0.05
Model	Corrected	231.614[a]	2	115.807	1.246	0.299
	Intercept	8235.967	1	8235.967	88.596	0.000
Pretest	Achieve	152.110	1	152.110	1.636	0.208

	Gender	65.915	1	65.915	0.709	0.405
	Error	3625.475	39	92.961		
	Total	246672.580	42			
Total	Corrected	3857.089	41			

Sig. at $p \leq 0.05$ Dependent Variable: ACHIEVEMENT

Table shows the ANCOVA result of achievement scores of male and female NTI students taught Integrated Science concepts using e-learning. From the table, there is no significant difference in achievement between the male and female NTI students taught Integrated Science concepts using e-learning, $F(1, 39) = 0.709$, and $p = 0.405$ which is greater than 0.05 level of significance. Therefore, hypothesis four is accepted/retained as it can be concluded that gender of NTI students taught Integrated Science concepts using e-learning instructional strategy does not have significant impact on the achievement of students in Integrated Science concepts.

VIII. DISCUSSION

The paper however, concluded based on the analysis of the result in this study that the use of e-learning instructional strategy approach enhances achievement of students in concept of integrated science as well as increased their retention than the conventional method. With e-learning instructional strategy approach students learn better about concept of integrated science, carried out their responsibilities and make effort to achieve a stated objective. Therefore, unlike the conventional method, e-learning instructional strategy approach help students to be responsible in self-learning and it is an appropriate method for teaching Concept of integrated science concepts since students are actively involved in teaching-learning process.

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