



**NIGERIAN ONLINE JOURNAL OF
EDUCATIONAL SCIENCES AND
TECHNOLOGY**

nojest.unilag.edu.ng

nojest@unilag.edu.ng

**IMPACT OF INDIVIDUALIZED LEARNING STRATEGY ON STUDENTS' INTEREST
IN DATA PROCESSING IN NNEWI EDUCATION ZONE OF ANAMBRA STATE**

**OKEKEOKOSISI JOHNBOSCO O. C.
ANAEKWE MARCELLINUS, C.**

Computer Education Department, School of Science, ¹Federal College of Education (Technical),
Asaba, Delta State, Nigeria.

Department of Science Education, Faculty of Education, National Open University of Nigeria

To cite this article:

Okekeokosisi, J. O. C & Anaeke, M. C. (2024). Impact of individualized learning strategy on students' interest in data processing in Nnewi education zone of Anambra State, Nigeria. *Nigerian Online Journal of Educational Sciences and Technology (NOJEST)*, 6 (2), 15-25

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

Authors alone are responsible for the contents of their articles. The journal owns the copyright of the articles. The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of the research material.



**IMPACT OF INDIVIDUALIZED LEARNING STRATEGY ON STUDENTS' INTEREST
IN DATA PROCESSING IN NNEWI EDUCATION ZONE OF ANAMBRA STATE**

**OKEKEKOSISI JOHNBOSCO O. C.
ANA EKWE MARCELLINUS, C.**

Article Infor

Article History

Received:
20 June 2024

Accepted:
10 October 2024

Keywords

Data Processing, students' interest, individualized learning strategy, gender

Abstract

The study examined how data processing students' interest could be improved through the use of individualized learning strategy in Nnewi Education Zone of Anambra State, Nigeria. The study adopted a quasi-experimental design, specifically the pretest posttest non-equivalent control group research design. Two research questions and two null hypotheses guided the study. A two-stage sampling procedure were used to sample 38 public co-educational secondary schools out of 50 public schools in Nnewi education zone of Anambra State. A simple random sampling technique (balloting without replacement) were used to select 6 public co-educational secondary schools. Intact classes from the 6 schools were used for the study. The instrument used for data collection were an adapted interest scale questionnaire. The reliability of the interest scale tagged computer maintenance ethics and human issues questionnaire (CMEQAHI) were determined using Cronbach Alpha method with an index value of 0.71. The two groups were taught six lessons on the theme computer maintenance ethics using individualized learning strategy (ILS) and lecture method (LM) respectively. Data were collected by administering CMEQAHI on the participants as pre-test and post-test. Data obtained were analyzed using mean, standard deviation and two-way Analysis of Covariance. The findings revealed among others that there is a significant difference in the mean interest rating scores of students exposed to ILS and LM in favour of the former group. Based on the findings, the study recommended that individualized learning strategy should be incorporated in the curriculum as a teaching strategy in teaching data processing in the classroom since it encourages self-development.

Introduction

Data processing deals with collection and manipulation of digital data to produce meaningful information. Hiller (2023) defined data processing as the collection and transformation of raw data into meaningful information. It is the conversion of raw data to machine-readable form. Flow of data through the central processing unit (CPU) and memory to output devices and formatting. Data

processing as described by Okekeokosisi, Anaeke, Akachukwu & Atiu (2023) as any use of computers to perform defined operations on a set of data. It plays a vital role in scientific, technological, socio-economic, political, election process and towards national development. Thus, the Federal Republic of Nigeria (2013) saw the need to introduce data processing as a subject in Nigerian secondary schools. The objectives of data processing as stipulated by FRN (2013) are; to enable learners acquire basic skills for database management, use the computer to facilitate business transactions and develop reasonable level of competence in ICT applications that will engender entrepreneurial skills and sustain students' interest in the subject.

The theory of Individualized instruction was developed in the middle sixties by Fred Keller and Gilmour Sherman. The theory states that learners learn materials in small units. This theory tailored to fit the educational needs and skills of an individual learner. This involves changing the pace the information is delivered, the methods through which the content is offered and the materials distributed. According to theory learners are provided within depth and effective educational materials such as interaction media or textbooks. Lecture time and presentations are usually kept to a minimum and learners are encouraged to review, research and learn the materials on their own. This allows each learner to acquire knowledge at his / her own pace and is particularly useful in classrooms that have a high learner to teacher ratio.

The application of this theory in the educational environment is that it offers learners of various skill levels, the opportunity to acquire knowledge at their own pace through different learning styles and different learning materials. Thus, the need for the present study is to ascertain students' interest in learning computer maintenance ethics and human issues which is presented as a theme in data processing curriculum, which houses computer ethics, safety measures, maintenance of computer I, maintenance of computer II, computer virus, career options in IT data processing taught as a topic in data processing class.

Interest could be defined as the focusing of the sense organs on or giving attention to some person, activity, situation or object (Nwosu & Ndanwu, 2020). It could be regarded as the feeling one has in the cause of wanting to know or learn more about somebody or something. It is useful in predicting the success and the satisfaction which an individual is likely to obtain from engaging in certain activities now and in future. Anyanwumelu and Okigbo (2022) viewed interest as the

persistent tendency by the student to engage in the teaching and learning process which lasts all through the duration of the instruction. It is on this note that adequate teaching strategies and learning should be used to increase male and female students' interest in computer studies.

Male and female are attributes of gender. Gender has been the focus of educational research in recent years since some courses have been ascribed to be mainly for the male students or female students. Anaekwe, Nnaka and Anaekwe (2018) described gender as economic, social, cultural attributes and opportunities associated with being male or female. It is a psychological term that describes behaviours, attitudes and personality traits that are designated as either masculine or feminine in a given culture (Brown & Jewell, 2019). This behaviour and attributes could be seen as cultural constructs that distinguishes the roles, mental and emotional characteristics and behaviours of male and female in a society. In spite of this, the study seeks to determine if individualized learning strategy could promote students' interest in data processing in respective of students' gender.

Statement of the Problem

Experts, researchers and examination body in data processing have established that teaching-learning in Nigeria is centered on traditional method of teaching. This could be seen from data processing Chief examiners' reports of WASSCE May /June 2021-2022 which reveals inconsistency in students' achievement in the subject. The reports attributed the cause of the students' inconsistency in achievement to students' poor practical knowledge, poor presentation of answers, wrong spelling of technical terms and illegible handwriting. The listed general comments and candidates' weakness are attributed to inappropriate method of teaching used by their teachers since learners are not stimulated during the learning process. Thus, the problem of the study therefore, is to determine the extent ILS could stimulate and sustain learners' interest when taught data processing.

Purpose of the Study

The purpose of the study was to determine if individualized learning strategy can promote students' interest in data processing in Nnewi Education Zone of Anambra State. Specifically, the study sought to determine the:

1. Interest of students taught data processing using ILS and those taught using LM.
2. Interest of male and female students taught data processing using ILS and those taught using LM.

Research Questions

The following research questions guide the study:

1. What are the interest of students taught computer studies using ILS and those taught using lecture method?
2. What are the interest of male and female students taught Computer studies using ILS and those taught using lecture method?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

1. There is no significant difference in the mean interest rating of students taught data processing with ILS and those taught with lecture method.
2. There is no significant difference in the mean interest rating of male and female students taught data processing using ILS, and those taught with lecture method.

Method

The study adopted quasi-experimental design specifically, the pre-test, post-test, non-equivalent control group was used. The study was carried out in Nnewi Education Zone of Anambra State, Nigeria. The population consist of 1,994 Senior Secondary School year two (SS2) students offering data processing in the 50 public secondary schools in Nnewi Education Zone. A sample size of 111 SS2 data processing students, made up of 51 males and 60 females were involved in the study obtained using multi-stage sampling procedure. The Purposive sampling technique were used to select 38 public co-educational secondary schools out of 50 public schools in Nnewi education zone of Anambra State. A simple random sampling technique (balloting without replacement) were used to select 6 public co-educational secondary schools from 38 public co-educational secondary schools. Intact classes from the 6 schools were used in this study. The choice of SS2 data processing students was because they have been exposed to the subject for almost two years. The instrument used for data collection was an adapted interest scale questionnaire of Okekeokosisi and Okeke (2015). The adapted instrument was a 15 item, 4-point rating scale of Strongly Agree (4points), Agree (3points), Disagree (2points) and Strongly Disagree (1point).

These items contained both positive and negative statements of feelings and interest from the students' point of view. The instrument was validated by three experts. The reliability of the interest scale tagged Computer Maintenance Ethics Questionnaire and Human Issues (CMEQAH) was determined using Cronbach Alpha method. Its reliability co-efficient was found to be 0.71 indicating that the instrument is reliable. The researchers trained regular data processing teachers from experimental and control group schools with their lesson plans for three days on how to use ILS as research assistant. The two groups were taught and allowed for five minutes to feel the impact on the concept taught using individualized learning strategy (ILS) and lecture method (LM) respectively. The teaching was done by their regular class teachers using their regular lesson periods and applying the model specified (ILS and LM).

Before the teaching commenced, pre-test questionnaire were administered to learners in the sampled schools. After the pre-test was administered to sampled schools, only experimental group were taught computer maintenance ethics using ILS. Computer Maintenance Ethics Questionnaire and Human Issues (CMEQAH) were retrieved from the research subjects since the items in the pre-test were re-organized and used as post-test. After the treatment which lasted for 4 weeks, the post-test questionnaire (CMEQAH) was administered to both groups. CMEQAH were collated accordingly and posttest scores, noted. The research questions were answered using descriptive statistics while the hypotheses were tested at 0.05 level of significance using analysis of covariance. In taking decision, reject the null hypotheses if the probability value (P-value) is less than or equal to significant value of 0.05 ($P \leq 0.05$); otherwise, do not reject the hypotheses.

Results

Research Question 1: What are the interest mean scores of secondary school students taught data processing using individualized learning strategy (ILS) and those taught using lecture method?

Table 1: Mean interest scores of secondary school students taught data processing using ILS and lecture method

Source of Variation	N	Pretest Mean	Posttest Mean	Gained Mean	SD Pretest	SD Posttest
ILA.	60	27.82	53.87	26.05	8.50	8.29
LECTURE	51	23.41	43.45	20.24	11.27	10.64

Table 1, it was observed that secondary students taught data processing using individualized learning strategy had pretest mean score of 27.82, SD of 8.50 and posttest mean score of 53.87, SD of 8.29 with gained mean 26.05 in their interest. While those taught using lecture method had pretest mean score of 23.41, SD of 11.27 and posttest mean score of 43.45, SD of 10.64 with gained mean 20.24. With posttest mean scores above the norm of 37.5, the two instructional methods are effective in enhancing secondary school students' interest scores in computer studies. However, ILS is more effective than the other method with gained mean of 26.05.

H₀₁: There is no significant difference in the mean interest rating scores of students taught data processing with ILS and those taught with lecture method.

Table 2: ANCOVA on the interest mean scores of secondary school students taught Computer studies using individualized learning strategy (ILS) and those taught using lecture method

Source of variation	SS	df	MS	Cal. F	Pvalue	P < 0.05
Corrected Model	3970.152	2	1985.076	24.529		
Intercept	23586.995	1	23586.995	291.460		
Interest1	979.443	1	979.443	12.103		
Instructional Method	2162.866	1	2162.866	26.726	0.000	S
Error	8740.118	108	80.927			
Total	280104.000	111				
Corrected Total	12710.270	110				

Table 2 indicates that at 0.05 level of significance, 1df numerator and 108df denominator, the calculated F is 26.73 with Pvalue of 0.000 which is less than 0.05. Therefore, the first null

hypothesis is not accepted. So, the difference in the mean interest scores of students taught individualized learning strategy and those taught with lecture method is significant.

Research Question 2: What are the mean interest rating scores of male and female students taught data processing using ILS and those taught using lecture method?

Table 3: Pretest and Posttest mean interest scores of male and female secondary school students taught data processing using ILS and lecture method.

Source of Variation	Gender	N	Pretest Mean	Posttest Mean	SD Pretest	SD Posttest	Gained Mean
ILA.	Male	31	28.06	52.00	9.51	9.72	23.94
	Female	29	27.55	55.86	7.42	5.96	28.31
LECTURE	Male	20	23.50	42.80	11.99	10.78	19.30
	Female	31	23.35	43.87	10.98	10.70	20.52

Table 3 reveals that the male secondary students taught data processing using individualized learning strategy had pretest mean score of 28.06, SD of 9.51 and posttest mean score of 52.00, SD of 9.72 with gained mean 23.94 in their interest, while their female counterparts had pretest mean score of 27.55, SD of 7.42 and posttest mean score of 55.86, SD of 5.96 with gained mean 28.31. With gained mean scores of 28.31 for the female students and 23.94 for the male students, individualized learning strategy is more effective in enhancing female secondary school students' interest scores in data processing.

Also, male secondary students taught data processing using lecture method had pretest mean score of 23.50, SD of 11.99 and posttest mean score of 42.80, SD of 10.78 with gained mean 19.30 in their interest while their female counterparts had pretest mean score of 23.35, SD of 10.98 and posttest mean score of 43.87, SD of 10.70 with gained mean 20.52. With gained mean scores of 20.52 for the female students and 19.30 for the male students, lecture method is more effective in enhancing female secondary school students' interest scores in data processing.

H0: There is no significant difference in the mean interest scores of male and female students taught data processing using ILS, and those taught with lecture method.

Table 4: ANCOVA on the interest mean scores of male and female secondary school students taught Data Processing using individualized learning strategy (ILS)

Source of variation	SS	df	MS	Cal. F	Pvalue	$P \leq 0.05$
Corrected Model	617.182	2	308.591			
Intercept	10437.182	1	10437.182			
Interest1	393.697	1	393.697			
Gender	241.665	1	241.665	4.007	0.050	S
Error	3437.751	57	60.311			
Total	178152.000	60				
Corrected Total	4054.933	59				

Table 4 indicates that at 0.05 level of significance, 1df numerator and 59df denominator, the calculated F is 4.01 with Pvalue of 0.050 which is equal to 0.05. Therefore, the second null hypothesis is not accepted. So, the difference in the mean interest scores of male and female students taught individualized learning strategy is significant.

Discussion

The study investigated on the impact of individualized learning strategy on students' interest in data processing in Nnewi education zone of Anambra State. Evidence from this study has shown that individualized learning strategy is more effective in enhancing secondary school students' interest scores in computer studies. This can be seen in the findings of Onwubumpe and Okigbo (2021), Rini, Mujiyati, Sukamto and Hariri (2022) who in their separate studies found that individualized instructional strategy generates' students interest in learning. In line with this, data in Table 4 on significant effect of gender on male and female students taught individualized learning strategy in data processing is significant. This contradicts the findings of Okekeokosisi and Okigbo (2021) which reveals no significant difference in the mean interest scores of male and female students' exposed to activity-based instructional strategy when exposed to computer studies lessons. Dawal (2021) which reveals that female students achieve higher than the male students when taught with individualized learning strategy than with lecture method.

Conclusion

The frustrating learners' interest in data processing as portrayed in internal and external examinations in senior secondary school in Nigeria calls for improvement in the mode and methods of teaching and learning of the subject. This was one of the major factors that necessitated this study, to identify other strategies of teaching-learning data processing in the secondary schools in Nigeria.

Recommendations

Based on the findings of the study, the following recommendations were made;

1. Individualized learning strategy should be incorporated in the curriculum as a teaching strategy in teaching data processing in the classroom since it encourages self-development.
2. Teacher training institutions should review the instructional strategies use in educating will be teachers and in-service teachers for appropriate application of instructional strategies in teaching
3. Professional Associations like STAN should popularize the use of innovative teaching strategies among science teachers for improved learning outcomes among students.

References

- Anaekwe, M.C., Nnaka, C.V. and Anaekwe, G.U.(2018). Gender differences in candidates' experiences with computer-based test (CBT) at Unified Tertiary Matriculation Examination (UTME). In Z.C., Njoku, U.M. Nzewi & C.V. Nnaka (Eds). *Perspectives on science and technology education in Nigeria*. Nsukka: Great AP Express publishers Ltd.
- Anyanwumelu, O. & Okigbo, E.C. (2022). Effect of scaffolding instructional strategy on secondary school students' interest in Geometry in Otucha Education zone of Anambra State. *SEJRSD*, 10 (1); 69-88.
- Brown, C.S. and Jewell, J.A. (2019). *Gender-introduction to psychology*. Retrieved on 7th June, 2022 from <https://openpress.usask.ca>
- Dawal, B.S. (2021). Effects of individualized instructional strategy (IIS) on the achievement of students in Basic science and technology in a COVID-19 preventive classroom management in Plateau State. *Sapientia Foundation Journal of Education, Sciences and Gender Studies*, 3(2); 109-120.
- Federal Republic of Nigeria (2013). *National policy on education*. 6th Edition. Yaba: NERDC press.

- Hillier, W. (2023). What is Data processing? A beginner's guide. Retrieved from <https://careerfoundry.com/en/blog/data-analytics/what-is-data-processing/>
- Nwosu, O. & Ndanwu, A.I. (2020). Effect of computer aided instruction on students' interest in selected topics in electronic libraries course in federal tertiary institutions in Anambra State, Nigeria. *Library and Information Perspectives and Research*, 2(1); 71-81.
- Obiora Nwosu, O. & Ndanwu, A.I. (2020). Effect of computer aided instruction on students' interest in selected topics in electronic libraries course in federal tertiary institutions in Anambra State, Nigeria. *Library and Information Perspectives and Research*, 2(1); 71-81.
- Okekeokosisi, J.O.C. & Okeke, C.N.A. (2015). The effect of constructivist teaching approach on students' academic achievement, gender and interest in junior secondary school agricultural science. *Contemporary Journal of Empirical Research*, 1(1); 105-125.
- Okekeokosisi, J.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.
- Okekeokosisi, J.O.C. Anaekwe, M.C, Akachukwu, E.E. & Atiu, K.Y.(2023). Effect of computer games instructional strategy on secondary school students' achievement and gender in data processing in Ogidi education zone. *Social science and education research review*, 10, Issue 1, 218-224.
- Onwubumpe, B.N. and Okigbo, E.C. (2021). Effect of self-regulated learning cycle on secondary school students' interest in mathematics in Onitsha education zone. *SEJRSD*, 4(1); 157-169.
- Rini, R., Mujiyati., Sukamto, I., & Hariri, H. (2022). The effect of self-directed learning on students' digital literacy levels in online learning. *International Journal of Instruction*, 15(3); 329-344.