



EFFECTS OF DIGITAL INSTRUCTIONAL PACKAGE ON SECONDARY SCHOOL STUDENTS LEARNING OUTCOMES IN ECONOMICS IN LAGOS STATE, NIGERIA

BY

AMAO-ADELEKE, Lukmon Adesile

Institute of Education, University of Ibadan, Nigeria
amao4sure@gmail.com | (+234) 803 360 3589

Abstract

The study investigated the effects of Economics Instructional Package (EcolPac) on secondary school students' learning outcomes in Economics. The moderating effects of gender and students perception to Economics topics were taken into consideration. The study adopted quasi experimental, Pretest-posttest control research design. A multi-stage sampling procedure was used for the study. The research instruments for data collection were Treatment Package, Gender, Economics Achievement Test and Student Perception to Economics Topics Questionnaire, with reliability coefficients of 0.77 and 0.87 respectively. Sampled population comprised 398 public senior school respondents from six (6) schools randomly selected from the three (3) Educational Districts, Lagos State. Data were analysed using Analysis of Covariance at 0.05 level of significance. Results revealed a remarkable treatment effect on students learning achievement in Economics over control group ($F_{(2,386)} = 27.88, p < 0.05$). The finding also showed that treatment and gender interaction did not significantly affect students achievements $F_{(1,386)} = 0.006, p > 0.05$. And no interaction effect between treatment therapy and students perception to Economics topics ($F_{(2,386)} = 0.96, p < 0.05$). It was concluded that Economics Instructional Package (EcolPac) is effective in improving students learning outcome in Economics. It is therefore recommended that, students should be encouraged to learn difficult topics with digital Instructional Package.

Keywords: Gender, Learning Package, Learning Outcomes, Students Perception

Introduction

Economics is a practical subject man perform on daily basis. It is a subject that deals with production, distribution, consumption, allocation of scarce resource to satisfy human desires and to make profit through rational decision making. It is a subject design for senior school students but not compulsory for all departments at senior school level.

Adeyemi-Adewoyin (2021) was of the view that, Economics is of great importance. It helps students to understand basic skills required to attain self-reliance and nation building. It equip students on how to proffer

solution to economics challenges. At senior secondary school level, Economics is categorized as business subject in the senior secondary curriculum Federal Republic of Nigeria (FRN, 2014). Economics was widely offered and registered at West African Examination Council and National Examination Council. As a social science subject, it enables science students especially, to switch to other discipline of learning at tertiary institution. In recent times, academic achievement of Economics students has been inconsistent at the senior secondary school certificate examination (Mohammed and Jimoh

2022, Amao-Adeleke and Akorede, 2024).

Ede and Oleabhiere (2016) identified some reasons behind the inconsistent performance. These reasons are numerous in literature reviews over causes of poor performance. Arsaythamby and Julinamary (2015) reported that Economics involves use of some mathematical operations, tables and graphs interpretations using Economic theories and this makes some topics in Economics to be described to be difficult. Quite a lot of students demonstrated great deficiencies on Economics questions that has data response questions using graphs and tables to solve economic problems (WAEC, Chief Examiners Report 2021, 2022 and 2023). The cause of the inconsistent performance was attributed to some difficult topics in Economics (Mohammed and Jimoh, 2022). This makes students to find it challenging to expatiate their points to earn good marks.

Olamigoke and Ibode (2018) reported that learning has gone beyond classroom. It was suggested that schools should imbibe technological-based instruction for teaching and learning. This would make learning student centred. The use of technology for education has become part of human development. This has been proven in various sector of the economy and education is not left out. The introduction of technology to education is a global adventure. Today technology for education exist in Google meet, Zoom, Whatsapps, PowerPoint, Microsoft team, Youtube, among others.

Egbo et al; (2011) and Eiadat (2014) described instructional software as the use of computer to provide sequence of learning objectives to the students, it is organized and presented in images, sound and text and gives students the opportunity to interact positively with the software package. Olamigoke and Ibode (2018) defined

software application as the use of ICT for teaching and learning in achieving students learning outcomes. Okorie and Agah (2014) reported that some teachers rely more on use of textbook for learning and develop negative disposition to the use of instructional materials. (Taiwo, 2009, Ohakamike, 2020 and Olamigoke, 2021) were of the view that, some teachers use technological based instructions for teaching and learning. It motivates and provides learning experiences to students through the use of different means of presentation. Ogunyomi (2021) developed Circle Geometry Software Package (CiGoSPac) for teaching and learning. It investigated the effect of CiGoSPac on students learning outcomes in Mathematics. The result revealed that, the therapy intervention significantly affect students learning outcome in Geometry. In another study, Ogunrinde (2023) developed and investigated the effect of learning package-Technology Enabled Assessment for Learning Package with Feedback (TEALPF) and Technology Enabled Assessment for Learning Package with Feedback and Remediation (TEALPFR) in Basic Science junior secondary school learning outcomes. The result showed that, the learning package (TEALPFR, TEALPF) significantly affect students learning outcome in Basic science.

The adoption of media or technology in education today can be seen as complimentary to teachers' activities during lesson delivery. Therefore, educational media are tools for teaching and learning either with the presence of the teachers or not. Babiker (2015) asserted that teachers should develop their instructional objectives (lesson) along technological-based instructions. Literature revealed that, software packages have been developed for teaching and learning Ogunyomi (2021). Quite a few had been developed for Economics while

some are on Google play store for learning of Economics.

The study of Amao-Adeleke (2025) developed a digital Instructional package for the learning of difficult topics in Economics and was adopted for the study. It was designed with ADDIE model. The learning package was developed into two modes, Economics Instructional Package (EcolPac) was developed using text and diagrams on a web browser (goggle chrome) for learning Economics. It has no sound and animation. While Economics Instructional Package Sound and Animation (EcolPacSA) was also built using text, diagrams, sound and animations, it was built on a web browser (goggle chrome) for learning Economics. The package was built with interactive learning feature such as loudness, text size, text colour, navigation of each slides (backward and forward pointers), topics in each lessons, quiz items for each lesson, feedback responses on wrong or correct option selected by the student. As well as percentage score of student. It has feature to retake the lesson or to select new lesson. The learning package contained eight (8) Economics topics identified as difficult to learn by the students.

Abubakar and Oguguo (2011) defined gender as the features that makes organisms to be identified with, on the basis of reproductive function as males or females. Adigun, Onihunwa, Irunokhai, Sada and Adesina (2015) referred gender as the biological and behavioural characteristics regarding being male or female. Differences in gender usually manifest, regardless of age, it was reported that boys tends to spend ample time on physical activities while girls demonstrate their skills on self-care activities (Hands et al., 2016). Osisanwo, Mabekoje, Shoaga and Iheanyichukwu (2024) regarded gender as a social trait attributed to being male or female a

d relationship between them. Gender as a moderating variable is used to raise a question if digital package have same effect on students' academic performance in Economics irrespective of their gender. Gender differences in academic achievement have been examined in literature Abubakar and Oguguo (2011, Hand et al., (2016), and Afianty, Manogu and Marthaulina (2018).

Literature revealed that, there is significant differences in gender when it involves academic achievement in various disciplines, either males or females perform better while other researchers found no significant difference to academic achievement. For instance, the study of Baser (2013) revealed that, male students display good academic achievement than the females' students in computer programming. Ali, Goni, Yagana and Bularafa (2015) study revealed that no significant difference exist in gender and academic performance in college of education Bornu State. Ironically, the study of Osisanwo et al., (2024) result showed that there is significant effect of game-based treatment and gender on the executive functioning of children at pre-school on two way manner. This showed that game-based therapy performed better on the executive functioning of male in pre-school children than females. Thus, the females in pre-school can be encourage to adapt to it gradually.

Perception involves habitual tendencies that influences people's way of doing things Egbo et al., (2011). Rahmania (2020) defined perception as the use of sense organs in interpreting or presenting ideas and things. Arsaythamby and Julinamary (2015) posited that, due to students' disposition to learning, teachers usually adopt diverse teaching methodology to guide knowledge. This helps to retain students' knowledge and interest in learning. Chukwuemeka and Dorgu

(2019) were of the opinion that, methodology deploy in teaching is among factors that shapes perception of students to learning. It is believed that when the right method of teaching is employed, it provides positive disposition to learning.

Economics require encoding and decoding of certain principles and concept to be able to interpret economics issues appropriately. Encoding refers to skills involving mathematical functions to graphical illustrations in Economics while decoding is presenting economics issues in mathematical functions so as to give plausible solutions to economic problems. Hence, students' needs to understand basic concepts and principles of Economics of the subject matter. Some students perceives Economics as mathematical inclined subject and feels it is difficult to study very well during examination Adolphus and Agbesor (2008). This assertion makes students to have poor performance in examination. According to Arsaythamby and Julinamary (2015) some students finds it challenging to interpret Economics theories and concepts well enough in attempting questions on Economics during examination and this could be reasons students develop certain disposition towards Economics. Bichi, Ibrahim and Ibrahim (2018) reported that, academic achievement of students at senior school certificate examination in Mathematics continued to decline due to negative perception students crave toward Mathematics

In the study of Hagan, Amoaddai, Lawer and Atteh (2020) students perceived Mathematics to be difficult and this affect students' performance in the subject and other related subjects that has Mathematical inclination. The mastery of the subject matter as well as the methodology of presenting the lesson to the student may influence the understanding of the topic in a subject. Consequently,

students perceived some topics in a subject to be difficult to comprehend especially when teachers do not have mastery of the lesson (Abd-El-Aziz, Nwokolo-Ojo, Hassan and Ann 2019)

Objectives of the study

- ❖ To examine how Economics Instructional Package (EcoIPac) have significant effect on students learning outcome.
- ❖ To investigate whether package intervention and gender interact to affect students' academic performance in Economics.
- ❖ To examine how package therapy and student perception to Economics topics interact to affect academic performance of students in Economics.

Hypotheses

- H₀₁: There is no significant main effect of treatment EcoIPac, EcoIPacSA on students' achievement in Economics.
- H₀₂: Economics Instructional Package (EcoIPac, EcoIPacSA) has no significant interaction effect on students' achievement and Gender in Economics
- H₀₃: The Economics Instructional Package (EcoIPac, EcoIPacSA) and Student Perception to Economics Topics (SPET) has no significant interaction effect on students' achievement in Economics.

Methodology

The study adopted a quasi experimental research design with 3x2x2 factorial matrix using non-randomised pretest, post-test and control groups. Treatment was considered at three levels - Economics Instructional Package with text and diagram. Economics Instructional Package having text, diagrams, sound and animation as well as control group. Gender was observed at two levels- male and female while, Student Perception to Economics topics was

considered at two levels- high and low. A multi-stage sampling procedure was used to select three (3) Educational District from six (6) Educational District in Lagos. Simple random was used to select two (2) schools each from the three (3) Educational District. A total of six (6) schools from the three (3) Educational Districts were randomly assigned to experimental and control groups. An intact class sampled of 398 SS 2 Economics students (148 males and 250 females) in public secondary schools in Lagos State, Nigeria were used for the study.

Four instrument were used in the study- Economics Instructional Package (EcolPac): This was implemented to two groups. **Economics Instructional Package (EcolPac)** was developed using text and diagrams on a web browser (Goggle chrome) for learning Economics. It has no sound and animation. While **Economics Instructional Package Sound and Animation (EcolPacSA)** was also a package built using text, diagrams, sound and animations, it was built on a web browser (Goggle chrome) for learning Economics. Both packages contained quiz items for each lesson, feedback responses on wrong or correct option selected by the student. The launching of the package, loudness, text size, text colour, navigation of each slides (backward and forward pointers), topics in each lessons, were checked. All corrections, suggestions were used to improve the package. Both packages were validated by experts in software development, seasoned teachers teaching Economics. The researcher and the research assistant ensured the instruments was used for the treatment groups.

Conventional Method (CM): This was developed by the researcher for the teaching of control group. It empowered the teacher to be seen as the only source of knowledge and

skills before the students. Students listened to their teacher's teachings and write on their note books when they are asked to do so. Also, the results were compared alongside the experimental groups.

Economics Achievement Test (EAT): The achievement test items were developed by the researcher to determine the learning outcome of students' in Economics before and after the treatment. The instrument was a multiple choice items with four option (A - D). The table of specification was used to establish the content validity. The study of Amao-Adeleke and Akorede (2024) identified eight (8) difficult topics and were used for the multiple choice items. The initial items contain one hundred and twenty (120) items. After a pilot study was carried out the final instrument contained fifty (50) items. The reliability of the instrument was 0.77 Kuder-Richardson (KR-20).

Student Perception to Economics Topics Questionnaire (SPETQ): The instrument was developed by the researcher. It contains 32 topic items extracted from the SSI - II Economics curriculum. The instrument was a 2- point response format (1) Easy to Learn, and (2) Difficult to Learn. It was validated and the reliability was determined using Cronbach alpha at 0.87. The instrument were administered to the students before and after the treatment.

Experiment procedure

The study was implemented in three stages

Stage One: Pre-Treatment: The experimental groups entails two groups - EcolPac and EcolPacSA as treatment and conventional method as control groups. The participants from each selected schools were randomly assigned as treatments and control group. The subject teachers in the sampled schools served as research

assistant and helped to administer the research instruments to the respondents as pretest.

Stage Two: Treatment: Within the duration of six weeks, the students in EcoIPac and EcoIPacSA groups used the packages for learning of difficult topics in Economics. Respondents in the control group were taught same topics using conventional method of teaching. They were not exposed to the treatment as a result of distance in the location of each schools.

Stage Three: Post Treatment: After the introduction of treatments for six

weeks, the potency of the treatment package was to be assessed, the treatments and the control groups were administered same instruments again as post-test at the end of the eight week. The data were analysed using analysis of covariance (ANCOVA) to ascertain the main effects, pretest as covariate.

Results

Hypothesis one:

There is no significant main effect of treatment EcoIPac, EcoIPacSA on students' achievement in Economics.

Table 1: Summary Analysis of Covariance of Treatment on Students Achievement in Economics

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	27553.643	11	2504.877	67.889	.000	.659
Intercept	27044.300	1	27044.300	732.976	.000	.655
Pre Achievement	223.901	1	223.901	6.068	.014	.015
Treatment	2057.523	2	1028.762	27.882	.000	.126
Gender	.234	1	.234	.006	.937	.000
Post SPET	65.394	1	65.394	1.772	.184	.005
Treatment * Gender	28.428	2	14.214	.385	.681	.002
Treatment * Post SPET	70.963	2	35.482	.962	.383	.005
Gender * Post SPET	.927	1	.927	.025	.874	.000
Treatment * Gender * Post SPET	8.194	1	8.194	.222	.638	.001
Error	14242.075	386	36.897			
Total	554010.000	398				
Corrected Total	41795.719	397				

a. R Squared = .659 (Adjusted R Squared = .650)

Table 1 revealed the summary of analysis of covariance (ANCOVA) of Economics students' achievement by treatment (EcoIPac, EcoIPacSA and Control group). The result showed that students' academic performance is remarkably affected by the treatment

($F_{(2,386)} = 27.88, p < 0.05$). The therapy revealed that, there is great effect on students' performance in Economics. The table shows the partial eta square (η^2) was 0.126 effect size.

Table 2: Estimated Marginal Means of Achievement in Economics by Treatment

Treatment	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
EcolPac	38.029	1.349	35.377	40.681
EcolPacSA	44.611	0.624	43.384	45.838
Control	28.086	2.062	24.031	32.141

a Covariates appearing in the model are evaluated at the following values: Pretest = 17.24.

Table 2 revealed the estimated marginal mean of students' achievement by treatment. It showed that participants in EcolPacSA (Economics Instructional Package having text, diagrams, sound and

animation) had a mean score of 44.61 with a standard error of .62 while participants in EcolPac (Economics Instructional Package with text and diagram) and control groups had a lower mean score of 38.03 and 28.09 with standard error of 1.35 and 2.06 respectively.

Table 3: Post-hoc Analysis of Treatment effect on Students Achievement in Economics

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
EcolPac	EcolPacSA	-6.582	1.501	.000	-10.191	-2.972
	Control	9.943	2.472	.000	4.000	15.886
EcolPacSA	EcolPac	6.582	1.501	.000	2.972	10.191
	Control	16.525	2.139	.000	11.382	21.668
Control	EcolPac	-9.943	2.472	.000	-15.886	-4.000
	EcolPacSA	-16.525	2.139	.000	-21.668	-11.382

Table 3 indicates that participants in EcolPacSA had significant effect over participants in EcolPac and control groups. The mean difference of EcolPacSA over the other groups were 6.58 and 16.53 with standard error of 1.50 and 2.14 respectively.

Hypothesis two: Economics Instructional Package (EcolPac, EcolPacSA) has no significant interaction effect on

students' achievement and Gender in Economics.

Table 4: Estimated Marginal Mean Economics Students Achievement and Gender by Treatment

Treatment	Gender	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
EcolPac	Male	37.716	2.195	33.399	42.032
	Female	38.343	1.561	35.273	41.412
EcolPacSA	Male	44.466	1.001	42.499	46.434
	Female	44.755	.699	43.382	46.129
Control	Male	26.068	.827	24.442	27.693
	Female	29.095	3.067	23.065	35.125

Table 4 result showed that, male respondents in the control group recorded a mean score of 26.06 standard error of 0.82, males in EcolPac recorded 37.71 standard error of 2.19 and male respondents in EcolPacSA recorded a mean score of 44.46 standard error of 1.00. In comparison, the female respondents in the control group recorded a mean score of 29.09 standard error of 3.06, females in EcolPac recorded 38.34 standard error of 1.56 and

female respondents in EcolPacSA recorded a mean score of 44.75 standard error of 0.69. Result in table 1 reveals that, there was no significant impact of gender on students achievements in Economics $F_{(1,386)} = 0.006, p > 0.05$. Thus, the hypothesis which stated that, treatment and gender do not significantly affect students' performance in Economics was accepted.

Table 5: Pairwise Comparison of Economics Achievement by Gender

Gender		Mean Difference	Std. Error	Sig.	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
Male	Female	0.689	1.517	.650	-2.295	3.672
Female	Male	-0.689	1.517	.650	-3.672	2.295

Table 5 indicated that, male participants had significant Economics achievement over the female with a mean score of 0.68, standard error 1.51.

Hypothesis three:

The Economics Instructional Package (EcolPac, EcolPacSA) and Student Perception to Economics Topics (SPET) has no significant interaction effect on students' achievement in Economics.

Table 6: *Estimated Marginal Mean of Student Perception to Economics Topics (SPET) and Treatment by Students Achievement in Economics*

Treatment	Students Perception to Economics Topics	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
EcoIPac	Low	37.865	2.632	32.690	43.040
	High	38.193	.573	37.067	39.319
EcoIPacSA	Low	44.392	1.000	42.425	46.358
	High	44.83	.699	43.456	46.205
Control	Low	25.338	.535	24.286	26.390
	High	33.581	6.102	21.585	45.577

a. Covariates appearing in the model are evaluated at the following values: Pretest = 17.24.

Table 6 result show that, Economics performance of students did not significant affect the interaction of treatment and Student Perception to Economics Topics (SPET). It revealed that perception to Economics topics (SPET) and students' academic performance was not remarkably affected by the treatment ($F_{(2,386)} = 0.96, p < 0.05$). Low perception students in the control group recorded a mean score of 25.33 standard error of 0.53, low perception students in EcoIPac recorded 37.86 standard error of 2.63 and Low perception students in EcoIPacSA recorded a mean score of 44.39 standard error of 1.00. In contrast, the high perception of students in the control group recorded a mean score of 33.58 standard error of 6.10, high perception of students in EcoIPac recorded 38.19 standard error of 0.57 and high perception of students in EcoIPacSA recorded a mean score of 44.83 standard error of 0.69 respectively. Thus, students' perception to Economics topics and treatment did not significantly affect students' academic performance.

Discussion

The study investigated the effect of treatment (EcoIPac, EcoIPacSA) on students' achievement in Economics using gender and students' perception to Economics topics as moderators. The result revealed that, treatment has remarkable effect on Economics students' performance. Invariable, EcoIPac, EcoIPacSA as treatment impacted significantly on students learning outcomes. This finding supports the study of Ogunyomi (2021) developed a package on circle geometry for SS II students where the participants were shared into three groups- treatments and control groups. The treatments groups received Circle Geometry using CiGoSPac therapy while the control groups did not receive any intervention. The therapy was given to the groups over a duration of eight weeks. The result showed that participants in the treatment groups performed excellently due to the use of package developed than those who were not exposed to the therapy.

The result of this of this study also corroborated the study of Ogunrinde (2023) investigated effect of a treatment package technology enabled assessment for leaning package with feedback (TEALPF) and technology enabled assessment for leaning package with feedback and remediation (TEALPFR). The package was developed to improve students learning outcomes in Basic Science Junior secondary school within the period of eight weeks. The result show that the therapy (TEALPFR, TEALPF) significantly affect the academic achievements of students in Basic science. This was demonstrated using estimated marginal mean score of the groups.

The study showed that Economics Instructional Package (EcoIPac) and gender has no appreciable interaction effect on students' achievement in Economics. This affirms the result study of Osisanwo, Mabekoje, Shoaga and Iheanyichukwu (2024) investigated how game-based exercise and gender affect functioning of pre-school children in a two way manner. The result revealed that treatment-game-based and gender did not significant affect the executive functioning of pre-school children.

Also, this study showed that treatment intervention and gender did not appreciable effects on students' academic performance in Economics. Even though, male participants achieved higher mean score against the female participants. In other word, the treatment significantly worked better on the experiment group than the control group in terms of gender participants. By implication, efforts can be geared towards improving learning outcome with the use of EcoIPac package.

Furthermore, the study revealed that students' perception to Economics (SPET) and treatment therapy had no significant effect on students'

achievement in Economics. High perception students in EcoIPacSA group had higher mean score than low students' perception. Also, the high perception participants in EcoIPac group also achieve higher mean score than low perception students to Economics topics. In the case of control group, the high perception students achieved higher mean score than the low perception student to Economics topics. The result agrees with Bichi, Ibrahim and Ibrahim (2018) asserted that, perception of students and academic achievement has no relationship thus some topics in Mathematics are still perceived to be difficult. In other word, treatment package and students' perception to Economics topics in terms of Economics did not remarkable impact on academic performance of students in Economics.

Conclusion

The study findings revealed that Economics Instructional Package (EcoIPac) have a remarkable impact on academic performance of students in Economics. It also indicated that treatment package and gender has no appreciable significant effect on students' academic performance in Economics. in addition, students' perception to Economics topics and treatment package did not significantly affect students learning outcomes. Furthermore, the result findings of this study revealed that (EcoIPac) have a significant effect on students learning outcome in Economics irrespective of their gender.

Recommendation

Based on the findings, Economics Instructional Package (EcoIPac) demonstrated significant effect on secondary school students learning outcome in Economics in Lagos State, Nigeria.

1. Use of ICT for learning should be encouraged by schools. It will aid their learning

developments and enable them to use Economics Instructional Package at their pace.

2. Schools with computers are encourage put them into use, install learning packages, get them updated when necessary. Learning with technological-based instructions will enrich students learning.
3. Curriculum planners should encourage schools to adopt indigenous learning package for learning. This will spur student's interest and improve academic performance.

References

- Abd-El-Aziz, A.A., Nwokolo-Ojo, J.O., Hassan, A.M., & Ann, U.O. (2019). Teachers' perception of difficult topics in upper Basic Technology Education Syllabus in Ibadan Metropolis Oyo State *Benue State University Journal of Education (BSUJE)* 19(1), 152-155.
- Abubakar, R.B., & Oguguo, O.D., (2011). Age and gender as predictors of academic achievement of College Mathematics and Science students publication on Proceeding of the 2011 International Conference on Teaching Learning and Change: *International Association for Teaching and Learning (IATEL)* 1-7.
- Adeyemi-Adewoyin, N. (2021). Effects of portfolio and peer assessment methods on senior secondary school students learning outcomes in Economics in Oke-Ogun, Oyo State, Nigeria. Unpublished Thesis Institute of Education University of Ibadan
- Adigun, A., Onihunwa, J., Irunokhai, E., Sada, Y., & Adesina, O. (2015). Effect of gender on students' academic performance in Computer Studies in secondary schools in New Bussa, Borgu Local Government of Niger State. *Journal of Education and Practice*, 6(33) 1-9.
- Adolphus, T., & Agbesor, A.A. (2008). Students' perception of the difficulty of topics in the senior secondary school Physics Curriculum *Journal of the Institute of Education, University of Port Harcourt*, 3(1), 127-133.
- Amao-Adeleke, L.A., & Akorede, S.F. (2024). Teachers and students' perception of difficult topics in senior secondary schools economics in Lagos State. *African Journal on Behavioural and Scale Development Research (AJB-SDR)*, 6(1), 76-86.
- Afianty, O., Manogu, R., & Marthaulina, M., (2018). Comparison of gender differences toward Mathematics cognitive learning outcomes in A Middle School: *Journal of Holistic Mathematics Education*, 1(2), 1-9.
- Ali, H.K., Goni, U., Yagana, S.B., & Bularafa, M.W. (2015). Gender difference in students' academic performance in College of Education in Borno: Implication for Counselling Department of Education, University of Maiduguri Borno State. *Journal of Education and Practice*, 6(32). www.iiste.org
- Arsaythamby, V., & Julinamary, P. (2015). Students' perception on difficulties of symbols, graphs problem solving in Economics *Procedia Journal for Social and Behavioural Sciences*, 17(2), 240 – 245.
- Baser, M. (2013). Attitude, danger and achievement in computer programming: Department of Computer Education and Instructional Technology, Ondokuz Mayıs University, Turkey *Middle East Journal of Scientific Research*, 14(2) <http://doi:10.5829/idosi.mejsr.2023.14.2.2007>

- Babiker, M.E.A. (2015). Effective use of multimedia in education, teachers must develop their own educational multimedia application. *Turkish online journal of Educational Technology*, 14(4), 62-65.
- Bichi, A.A., Ibrahim, R.H., & Ibrahim, F.B. (2018). Assessing student perception of difficult topics in Mathematics at senior secondary schools in Kano, Nigeria. *European Journal of Psychology and Educational Research*, 1(2), 53-59
- Chukwuemeka, I. P., & Dorgu, T.E. (2019). Students' perception of the difficult topics in biology at senior school level in Delta State, Nigeria. *Journal of Advances in Education and Philosophy*, 7(3), 62-66.
- Ede, M.O., & Oleabhiere, E.O. (2016). Assessment of secondary school students perceived difficult concepts in economics in Abia State, Nigeria. *Academic Scholarship Journal*, 11(1), 10-19.
- Egbo, O.P., Ifeanacho, I.C., Okoyeuzu, R.C., & Onwumere, J.U.J. (2011). Gender perception and attitude towards e-learning. A case of Business Students, University of Nigeria *International Journal of Computer Application ISSN 2250-1797*, 1(2), 135-139.
- Eiadat, Y. (2014). Instructional computer and its instructional application. *Amman Dar AlMasirah journal of Science and Technology*
- Federal Republic of Nigeria (FRN) (2014). *National Policy on Education*, Abuja NERDC press
- Hagan, J. E., Amoaddai, S., Lawer, V. T., & Atteh, E. (2020). Students' perception towards Mathematics and its effects on academic performance. *An Asian Journal of Education and Social Studies*, 8(1), 9-14.
- Hands, B., Larkin, D., Cantell, M. H., & Rose, R. (2016). Male and female differences in health benefits derived from physical activity: Implication for exercise prescription. *Journal of women's Health Issues and Care*, 5(4) <https://doi.org/10.4172/2325-9795.1000238>
- Mohammed, A. O., & Jimoh., S. A. (2022). Perceived difficult topics and senior secondary students' academic achievement in Economics Lagos State. *An Albukhary Social Business Journal*, 3(2), 83-93.
- Ogunrinde, H. B. (2023). Effects of technology-enabled assessment for learning package on junior secondary school students' basic science learning outcome in Ibadan Nigeria PhD Thesis, Institute of Education, University of Ibadan, Nigeria.
- Ogunyomi, K. O. (2021). Development and use of software package for teaching and learning circle geometry in senior secondary schools in Ibadan-Land, Nigeria PhD Thesis, Institute of Education, University of Ibadan, Nigeria.
- Ohakamike, O. N. (2020). Use of instructional media as determinant of students' achievement and attitude in English Language. *An International Journal of English Language and Linguistics Research*, 8(2).
- Olamigoke, G. O., & Ibode, F. O. (2018). Effect of computer graphics and animation instructional modes on junior secondary students' academic achievement and skills acquisition in Business Studies in Ibadan, Nigeria. *African Journal of Educational Management (AJEM)*, 19: 1-2.
- Olamigoke, G. O. (2021). Effect of computer graphics and animation instructional modes on junior secondary students' academic

- achievement and skills acquisition in Business Studies in Ibadan, Nigeria. PhD Thesis, Institute of Education, University of Ibadan, Nigeria.
- Okorie, E. U., & Agah, J. J. (2014). Teachers' attitude towards the use of computer software package in teaching chemical bonding. Curriculum development and instructional material Centre, University Of Nigeria, Nsukka. *An International Journal of Energy and Environmental Research Published by European Centre for Research Training and Development UK*, 2(2), 9-18. www.ea-journals.org
- Osisanwo, F. O., Mabekoje, S. O., Shoaga, O., & Iheanyichukwu, T. I. (2024). Effect of game-based activities on executive functioning among pre-school children. *African Journal of Behavioural and Scale Development Research (AJB-SDR)*, 6(1), 88-96.
- Rahmania, P. A. H. (2020). Economics students' perception, attitude and motivation toward learning English Language. *Jurnal Linguistik Terapan Pascasarjana*, 17(1), 43-58.
- Report, C. E. (2021). WAEC chief examiner's report May/June Economics, 175 – 184.
- Report, C. E. (2022). WAEC chief examiner's report May/June Economics, 180 – 191.
- Report, C. E. (2023). WAEC chief examiner's report May/June Economics, 163 – 171.
- Taiwo, O. (2009). Teachers perception of the role of media in classroom teaching in secondary schools *Turkish Online Journal of Educational Technology*, 8(1), 1-5.