Torney-Purta, J., Barber, C., & Wilkenfeld, B. (2015). How adolescents learn about civic engagement. Journal of Social Issues, 71(3), 513–531. https://doi.org/10.1111/josi.12128

IJSSE Vol. 3, No. 1 2026
Department of Social Science Education,
Faculty of Education,
University of Jos, Jos, Nigeria. Copyright c 2018
ISSN: 2616-1435

EFFECTS OF PERSONALIZED SYSTEM OF INSTRUCTION ON STUDENTS' ACHIEVEMENTS AND RETENTION IN ECONOMICS IN SECONDARY SCHOOLS IN WASE LOCAL GOVERNMENT AREA

[1]Rengkat Richard Yusuf, [2]Elkana Samuel Bwari, & [3]Buhari Garba
[1]Department of Social Science Education, Faculty of Education, University of Jos, Nigeria, rengkatrichardyusuf@gmail.com, +2348060302172
[2]Department of Social Science Education, Faculty of Education, University of Jos, Nigeria, sambwari@gmail.com, +2347063242727
[3]Department of Social Science Education, Faculty of Education, University of Jos, Nigeria, +2348036609936

Abstract
This study investigated effects of personalized system of instruction on students' achievements and retention in economics in secondary schools in Wase Local Government Area, Plateau State. The study adopted two objectives, two research questions and two hypotheses respectively. The study adopted non-randomized quasi-experimental design. The samples were drawn in the study using the purposive sampling technique. The population of the study comprised of 879 senior secondary two students in Government secondary schools in Wase Local Government Area. 190 economics students were drawn as the sample of the study. A class was assigned to the control group and also a class was assigned to the treatment group. Two instructional packages were developed, one for the control group and the other for the treatment group. The control group were taught using the conventional method while the treatment groups were taught using the personalized instruction strategy. Economics Achievement Test (EAT) was used to collect data for the study. The research questions were analyzed using mean and standard deviation while the hypotheses were tested using ANCOVA at 0.05 level of significance. The study findings revealed that there is significant effect of Personalized System of instruction on students' academic achievement at secondary schools; there is a significant effect of personalized system of instruction on students' retention in economics at secondary schools. The study recommended among others teachers of senior secondary schools should expose economics students to Personalized System of instruction to promote their academic performance in the subject, multimedia should be incorporated in the curriculum of teacher training institutions to promote retention ability in economics.

Keywords: Achievement, Economics, Personalized System of Instruction (PSI), Retention,

Introduction

In the past few decades, there have been significant changes in educational literature, practices, and psychology's attitude toward students. The development of high degrees of balance between educational systems on the one hand and learning on the other is the subject of concern (Alalwneh & Alomari, 2018). As a result of the knowledge explosion, changing economic conditions, and the adoption of contemporary educational technologies, current educational systems are facing a number of challenges that are reflected in the instructional delivery methods and learning modalities (learners' preparation) both academically (Olatide, 2018). As a result, they began searching for fresh methods and ways to assist the students in adjusting to the alterations.

The major goal of high-quality instruction is for students to succeed in their academic endeavors. The process of invention, innovation, and diffusion in technology in any country hinges on the study of science and technology. The significance of economics instruction cannot be overstated as it is used in almost every man activity, and profession incorporates some aspect of the technical education concept, (Olatoye, Salami, Olore & Adepoju 2022). An examination of the production, distribution, and consumption of goods and services is the purview of economics, a social science. The ability to get the most out of the resources at hand is emphasized. According to Ede and Oleahiele (2020) economics is a social science that investigates issues that come up as a result of the abundance of demands and the lack of resources necessary to meet them. At the senior secondary school level of education in Nigeria, it is one of the elective topics available. Olasinde (2022) went on to say that the organization of the economics curriculum content was likewise based on a spiral spread, allowing for the study of issues in both their basic and complicated forms, first in Senior Secondary One (SS1) and then in Senior Secondary Three (SSIII). The objectives of secondary school Economics as outlined by West African Examination Council (WAEC) in Babani (2023) among others included to: understand the basic economic principles and concepts as well as the tools for sound economic analysis, contribute intelligently to discourse on economic reforms and developments that affect or would affect the generality of Nigerians, understand the structure and the functioning of economic institutions; and appreciate the role of public policies on national economy.

In view of the importance derivable from the subject, it stands out as one of the most preferred subjects among other electives during Senior Secondary School Certificate Examination registration. The performance of students in Economics generally is not encouraging. The poor performances according to the Chief Examiners' reports (2020-20025) in Economics are more pronounced in Graph related concepts in Economics. The reports specifically noted that the weaknesses ranged from the students' poor knowledge of drawing and computing values on graph as well as interpreting graph. Some of the Economics concepts that involve graph include; demand and supply, cost and revenue concepts among others. Graph is an economic tool for analysis which every individual who studies Economics at any level of education must come across. Poor retention of what were already learnt could also be responsible

for students' inability to do well generally in Economics and specifically on graph related areas of Economics.

According to Friedman and Mandel (2021) teaching methods in the current educational system have shifted to non-traditional and modern ways; initiation, as it was in the early stages of educational growth, is no longer the norm. According to Costa (2019), interactions between teachers and students during the teaching and learning process should promote instead of the instructor taking control of the students' information transfer, the teachers should encourage the pupils to seek knowledge on their own. To get the most out of every learner, many tactics or strategies have been developed through modern, effective, and creative training with supported structures. Male and female students perform differently academically, according to the majority of scholars who have studied this issue. Studies by Ginanjar (2019) found that there are disparities in the linguistic, spatial, and mathematical aptitudes of men and women. Halpem and Stump (2019) supported the aforementioned claim by noting that males outperformed females in mathematical and spatial abilities, but that girls outperformed males in verbal fluency measures (vocabulary, listening, speaking, comprehension, fluency, and spelling). Academic performance is a term used to describe a student's level of academic achievement (Iyortsuun, Goyit & Dakung, 2021). Academic performance, according to Shuaibu, (2019), refers to what a person may achieve within a particular set of standards. Moscati and Caplin (2019) noted a notable sex disparity in academic achievement among pre-NCE students in Borno State's colleges of education. The mean score of the female students was greater than that of the male students.

The teacher is reduced to the role of a simple facilitator as a result of giving students the freedom to say what they want and explore several approaches to solving a particular academic difficulty or organizing their resources (Odo, Adenle & Okwori, 2022). However, Alieme (2020) argues that the presentation and structuring of the content as well as the features of the learning task themselves, which ultimately affect learners' attitudes, determine the quality of instruction in any teaching-learning setting. He continued by saying once more that instructors should decide in advance how to present a certain task. He thinks that both the rate of learning and accomplishment levels of students can be impacted by the quality of education. In essence, using ineffective teaching methods can result in students' poor academic achievement. Olagunju and Babayemi (2020) state that educational gains is the acquisition of scientific knowledge, attitudes, and skills of the students depend on the proper type of instructional strategies employed by the teacher.

In every way, students are not all the same. They pick up knowledge at various tempos and speeds. Thus, several instructional strategies were established by some researchers in order to assure that learners demonstrate desirable behavioral changes after learning. In 1960, Siegfried Engelmann and Wesley Becker created personalized instruction (PI), Fred Keller created the Personalized System of Instruction (PSI), and Benjamin Bloom is credited with creating Mastery Learning (ML) in 1971 (Mejanova, Lebedeva, Assylbekova and Ldokova 2022). Prior to introducing a new task, all of these teaching techniques or strategies are designed to make sure that students have mastered the current one.

The idea of PSI emerged from the application of Skinner's theories of learning, which are based on operant conditioning strategies of behaviorism principles with an emphasis on overt behaviors that can be observed and measured, (Alalwneh and Alomari 2018). Therefore, this research sort to investigate Effects of Personalized System of Instruction on Students' Achievements and Retention in Secondary Schools Economics in Wase Local Government Area, Plateau State.

Academic achievement represents performance outcomes that indicate the extent to which a person has accomplished specific goals that were the focus of activities in instructional environments, specifically in school, college, and university. School systems mostly define cognitive goals that either apply across multiple subject areas (e.g., critical thinking) or include the acquisition of knowledge and understanding in a specific intellectual domain (e.g., numeracy, literacy, science, history). Therefore, academic achievement should be considered to be a multifaceted construct that comprises different domains of learning. Because the field of academic achievement is very wide-ranging and covers a broad variety of educational outcomes, the definition of academic achievement depends on the indicators used to measure it. Among the many criteria that indicate academic achievement, there are very general indicators such as procedural and declarative knowledge acquired in an educational system, more curricular-based criteria such as grades or performance on an educational achievement test, and cumulative indicators of academic achievement such as educational degrees and certificates. All criteria have in common that they represent intellectual endeavors and thus, more or less, mirror the intellectual capacity of a person. In developed societies, academic achievement plays an important role in every person's life. Academic achievement as measured by the GPA (grade point average) or by standardized assessments designed for selection purpose such as the SAT (Scholastic Assessment Test) determines whether a student will have the opportunity to continue his or her education (e.g., to attend a university). Therefore, academic achievement defines whether one can take part in higher education, and based on the educational degrees one attains, influences one's vocational career after education.

Statement of the Problem

Economics play a central role in national development and students' future academic and professional pursuits. Over the years there is persistent fluctuation in the achievement and retention of Economics concepts among senior secondary school students in Wase Local Government Area (LGA) of Plateau State. This has become a major educational concern among stakeholders. Recent national examination statistics indicate a troubling trend in overall student achievement in core subjects across Plateau state. According to the West African Examinations Council (WAEC, 2025) results revealed that only 38.32 % of candidates obtained credits in at least five subjects, including Economics a significant decline from 72.12 % in the 2024 examination cycle, representing a 33.8 percentage point drop in overall pass rate.

While these figures reflect decline in performances, the Examination body (WAEC) further identified that the introduction of serialized objective question papers in key subjects,

including Economics, exposed weaknesses in students' preparation and mastery of content resulting in poor performance in objective components. Educators report that most students struggle to grasp and retain key Economics concepts, leading to repeated failures or low grades in examinations. This failure could be attributed to the conventional teaching approach, which is dominantly operational in many senior secondary schools within Wase LGA. This is largely teacher-centered and does not sufficiently accommodate individual differences in learning pace, background knowledge, and cognitive ability. Despite evidence from other educational contexts that Personalized System of Instruction (PSI) an approach emphasizing self-paced learning, mastery before progression, frequent assessment, and immediate feedback can enhance achievement and retention, there is limited empirical research investigating its effectiveness in teaching Economics within Wase LGA or Plateau State more broadly. Hence, this study aims to fill this gap by investigating the effects of Personalized System of Instruction on students' achievement and retention in economics in secondary schools in Wase LGA, Plateau state.

Aim and Objectives of the Study

The aim of the study was to investigate the effects of Personalized System of Instruction on students' achievement and retention in economics in secondary schools in Wase LGA, Plateau state. The specific objectives of the study are to:

1. determine the effects of personalized system of instruction on students' academic achievements in economics in secondary schools in Wase Local Government Area Plateau state.
2. determine the effects of personalized system of instruction on students' academic retention in economics in secondary schools in Wase Local Government Area of Plateau state.

Research Questions

The following research questions raised, guided the course of this study:

1. What is the effect of personalized system of instruction on students' academic achievements in economics at secondary schools in Wase Local Government Area, Plateau state?
2. What is the effect of personalized system of instruction on students' retention in economics at secondary schools in Wase Local Government Area Plateau state?

Hypotheses

The following null hypotheses which were tested at 0.05 level of significance were formulated for this study.

1. There is no significant effect of Personalized System of instruction on students' academic achievement at secondary schools in Wase Local Government Area, Plateau State.
2. There is no significant effect of personalized system of instruction on students' retention in economics at secondary schools in Wase Local Government Area Plateau State.

Methodology

The study was a quasi-experimental design that employed a pre-posttest design. According to Wase Area Education office, there are thirteen (13) public secondary schools in Wase L.G.A. of Plateau state that are offering Economics. The population of the study comprises one thousand four hundred and thirty-two (1432) SS 2 Economics students in public senior secondary schools in Wase Local Government Area, Plateau state comprises eight hundred and seventy-nine (879) males and five hundred and fifty-three (553) females with an average age of 16 to 17 years. Government secondary school Wase was selected using purposive random sampling techniques out of the twenty-two (22) schools in Wase Local Government Area. The sample consisted of one hundred and ninety (190) SS2 economics students, 105 for Experimental group and 85 for the control group. The instrument used in this study for data collection was the Economics Achievement Test (EAT). This study used split-half to measure the reliability of the EAT. The EAT was administered once to SS 2 students in a school different from the schools intended for this study after which the reliability (0.78) was obtained via Pearson product moment Formula. The justification for the use of Pearson product moment (PPM) was because it accommodates the dichotomous (i.e., right-wrong) answers that characterize the test. Mean and standard deviation was used to analyzed the research questions while the ANCOVA was used to test all hypotheses formulated at 0.05 significance level. The data were run with a Statistical Package Sciences (SPSS 21.0).

Results

Research Question One: What is the effect of personalized system of instruction on students' academic achievements in economics at secondary schools in Wase Local Government Area, Plateau state? To answer research question one, the post-test scores of students for EAT in the experimental and control groups were subjected to descriptive statistics in form of Means and Standard Deviations. This is presented in Table 1

Table 1

Analysis of Post-Test Means and Standard Deviations Scores for EAT of the Experimental and Control Groups

	Group	N	Mean	Std. Deviation	Std. Error Mean	Mean Difference
Post-test	Experimental	105	17.92	0.768	0.075	**3.84**
	Control	85	14.08	0.640	0.069	

Source: Authors computation 2026

Data in Table 1 revealed that the post-test means and standard deviations of students for EAT scores of experimental group were 17.92 and 0.768 while that of control group were 14.08 and 0.640. The mean score difference was 3.84 in favour of experimental group. This revealed

the treatment of personalized system of instruction is effective in improving students' achievement in the study area.

Research Question Two: What is the effect of personalized system of instruction on students' retention in economics at secondary schools in Wase Local Government Area Plateau state? To answer research question two, the post- post-test scores of students for EAT in the experimental and control groups were subjected to descriptive statistics in form of Means and Standard Deviations. This is presented in Table 2

Table 2

Analysis of Post- post-test Means and Standard Deviations Scores for EAT of the Experimental and Control Groups

	Group	N	Mean	Std. Deviation	Std. Error Mean	Mean Difference
Post-post test	Experimental	105	16.73	0.724	0.071	**4.39**
	Control	85	12.34	0.853	0.093	

Source: Authors computation 2026

Data in Table 2 revealed that the post- post-test means and standard deviations of students for EAT scores of experimental group were 16.73 and 0.724 while that control group were 12.34 and 0.853. The mean score difference was 4.39 in favour of experimental group

Hypothesis One: There is no significant effect of Personalized System of instruction on students' academic achievement at secondary schools in Wase Local Government Area, Plateau State. To test hypothesis one, the scores of experimental and control groups were subjected to Analysis of Covariance (ANCOVA). The result is presented table 3.

Table 3

ANCOVA Analysis of the Post-Test Mean Scores for EAT of the Experimental and Control Groups

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	693.713[a]	2	346.857	680.742	**0.000**
Intercept	791.302	1	791.302	1553.013	**0.000**
Pretest	0.532	1	0.532	1.045	**0.308**
Group	693.642	1	693.642	1361.345	**0.000**
Error	95.282	187	.510		
Total	50685.000	190			
Corrected Total	788.995	189			

R Squared = .879 (Adjusted R Squared = .878)

Source: Authors computation 2026

Data in Table 3 revealed that the F-value obtained was 1361.35; adjusted R Squared observed was 0.878 and the p-value of 0.000 was observed. Since the obtained p-value of 0.000 is less than the alpha value of 0.05, thus the study rejected the null hypothesis one that says there is no significant effect of Personalized System of instruction on students' academic achievement at secondary schools in Wase Local Government Area, Plateau State. The decision implies that, there is significant effect of Personalized System of instruction on students' academic achievement at secondary schools in Wase Local Government Area, Plateau State. This indicated that treatment with Personalized System of instruction has effect on students' achievement in academic (F (1, 189) = 1361.35, P = 0.00).

Hypothesis Two: There is no significant effect of personalized system of instruction on students' retention in economics at secondary schools in Wase Local Government Area Plateau State. To test hypothesis two, the scores of experimental and control groups were subjected to Analysis of Covariance (ANCOVA). The result is presented in table 4

Table 4

ANCOVA Analysis of the Post- post-test Mean Scores for EAT of the Experimental and Control Groups

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	907.021[a]	2	453.510	738.797	**0.000**
Intercept	735.721	1	735.721	1198.537	**0.000**
Pretest	0.849	1	0.849	1.384	**0.241**
Group	904.916	1	904.916	1474.166	**0.000**
Error	114.790	187	0.614		
Total	42462.000	190			
Corrected Total	1021.811	189			

R Squared = .938 (Adjusted R Squared = .937)

Source: Authors computation 2026

Data in Table 4 revealed that the F-value obtained was 1474.17; adjusted R Squared observed was 0.937 and the p-value of 0.000 was observed. Since the obtained p-value of 0.000 is less than the alpha value of 0.05, thus the study rejected the null hypothesis two (2) that says there is no significant effect of personalized system of instruction on students' retention in economics at secondary schools in Wase Local Government Area Plateau State. The decision implies that, there is a significant effect of personalized system of instruction on students' retention in economics at secondary schools in Wase Local Government Area Plateau State in favour of experimental group. This indicated that treatment with personalized system of instruction has effect on retention in economics (F (1, 189) = 1474.17, P = 0.00).

Discussion

The findings of research question one indicated there is significant effect of Personalized System of instruction on students' academic achievement at secondary schools in wase Local Government Area, Plateau State. Hypothesis one indicated that treatment with Personalized System of instruction has effect on students' achievement in academic. The result agreed with that of Romiro (2021) investigated the effects of personalized instruction on the academic achievement of students in Physics. It was found out that the students who were exposed to the constructive learning environment through personalized instruction performed better in their academic achievement in Physics: a highly significant effect on the academic performance of the students and a moderately high impact model of variability (72.7%) in their academic achievement. However, the result disagreed with that of Ching-Kun, Gwo-Jen Hwang, and Chih-Kai (2020) conducted a study on personalized recommendation-based mobile learning approach to improving the reading performance of EFL students. To evaluate the effectiveness of the proposed approach, an experiment was conducted on a senior high school English course by assigning three classes of students to two experimental groups and a control group. The results show that there was no difference in learning outcome between the two experimental groups in terms of learning achievements.

Findings from research question two revealed that there is a significant effect of personalized system of instruction on students' retention in economics at secondary schools in Wase Local Government Area Plateau State in favour of experimental group. Hypothesis two indicated that treatment with personalized system of instruction has effect on retention in economics. The result agreed with that of Ede and Oleahiele (2020) investigated the effects of personalized mastery learning strategy on students' academic achievements and retention in graph related concepts in Economics. The results among others showed that personalized mastery learning strategy have increasing significant effects on students' academic achievement and retention of graph related concepts in Economics. The result also agreed with that of Mejanova, Lebedeva, Assylbekova, and Ldokova, (2022) whose result revealed that personalized mastery learning strategy enhances retention in teaching and learning.

Conclusion

Based on the findings of this research, it can be concluded that, Personalized System of instruction improves students' achievement in economics of students under study. Personalized System of instruction fosters students' retention in economics of students under study, as there was significant difference between the post-post-test achievements mean scores of the control and experimental group in economics retention scores

Personalized System of instruction boosts students' achievement in economics of male and female students, as it revealed no significant gender difference in the achievement of economics. Personalized System of instruction is gender friendly strategy in enhancing the retention of students, as it revealed no significant gender difference in retention scores Treatment

with personalized system of instruction has no interaction effect on students' academic achievements and retention of secondary schools' economics students with gender.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Teachers of senior secondary schools should expose economics students to Personalized System of instruction to promote their academic performance in the subject.
2. Multimedia should be incorporated in the curriculum of teacher training institutions to promote retention ability in economics.

References

Alalwneh, K. M.N. and Alomari, M.F. (2018). The impact of a personalized system of instruction (PSI) on the achievement of the students in vocational courses. *International Journal of Education and Research, 6*(8), 81-92.

Aliyu, M. U. S. A. (2020). Effect of Demonstration Method of Teaching on the Academic Performance of Students in Motor Vehicle Mechanic in Yobe State. *International journal of Innovative Scientific and Engineering Technologies Research, 8*(2), 59-65.

Ali, S. (2020). Factors affecting academic achievement of students. *American Journal of*

Alieme, S. O. (2020). *Effects of a personalised system of instruction and direct instruction on primary five pupils' self-efficacy and achievement in mathematics in Oyo state*. Unpublished PhD Thesis Institute of Education, University of Ibadan, Ibadan, Nigeria.

Eccles, J. S., and Templeton, J. (2022). Chapter 4: Extracurricular and other after-school activities for youth. *Review of research in education, 26*(1), 113-180.

Friedman, B. A., and Mandel, R. G. (2021). Motivation predictors of college student academic performance and retention. *Journal of College Student Retention: Research, Theory and Practice, 13*(1), 1-15.

Fake, H., and Dabbagh, N. (2021, October). The Personalized Learning Interaction Framework: Expert Perspectives on How to Apply Dimensions of Personalized Learning to Workforce Training and Development Programs. *In Ninth International Conference on Technological Ecosystems for Enhancing Multiculturality (TEEM'21)*, 501-509.

Ginanjar, A. (2019). The effects of personalized system for instruction learning model on vocational school students' motivation. *Journal Pendidikan Jasmanidan Olahraga*, **4**(1), 32-36.

Iyortsuun, A. S., Goyit, M. G., and Dakung, R. J. (2021). Entrepreneurship education programme, passion and attitude towards self-employment. *Journal of Entrepreneurship in Emerging Economies*, *13*(1), 64-85.

Jayanthi, S. V., Balakrishnan, S., Ching, A. L. S., Latiff, N. A. A., andNasirudeen, A. M. A. (2019). Factors contributing to academic performance of students in a tertiary institution in Singapore. *American Journal of Educational Research, 2*(9), 752-758.

Moscati, I., and Caplin, A. (2019). The Foundations of Positive and Normative Economics: A Handbook. *Economics and Philosophy*, *26*(1), 101.

Mejanova, S., Lebedeva, M., Assylbekova, L. and Ldokova, G. (2022). Personalized distance-learning experience in determining students' performance. *World Journal on Educational Technology: Current Issues*. *14*(5), 1428-1437.

Olatide, A.E., (2018). Effect of two learning strategies on secondary school students' achievement in Social Studies in Kwara State, Nigeria, 1, 24-36. Retrieved June 15, 2019, from publications.uew.edu.gh › sites › default › files

Odo, M. I., Adenle, S. O. and Okwori, R. O. (2022). Enhancing mastery of practical skill in students of vocational and technical education through activity-based instruction. *Journal of Technical Education and Training (JTET), 4***(**2), 21-29

Olasinde, B. A. (2022). *Effects of Personalized and Direct Instructions on Pupils' Academic Performance in Numeracy in Ilorin West Local Government Area of Kwara State* (Doctoral dissertation, Kwara State University (Nigeria