



# ICT-Based Instructions and Senior Secondary School Students' Academic Achievement in Government in Ogun State, Nigeria

Aghadiuno Ijeoma Gloria<sup>1\*</sup>, Abdul Oluwasegun Omolaja<sup>2</sup>, Sowunmi Okanlawon Gbenga<sup>3</sup>, Ogunjimi Bisola Paulina<sup>4</sup>

*1 Institute of Educational Planning and Administration, Ondo, Nigeria*

*2 Lagos State Universal Basic Education Board, Lagos, Nigeria*

*3 Institute of Educational Planning and Administration, Ondo, Nigeria*

*4 Lagos State Universal Basic Education Board, Lagos, Nigeria*

**\*Corresponding Author Email:** *ijeomag3@gmail.com*

## Abstract

The study determined the effect of ICT-based self-learning instructional package on Government students' academic achievement in public secondary schools, Ogun State, Nigeria. Six research questions and three null hypotheses were stated to guide the study. The sample of the study comprised of 240 government students in public secondary schools in Ogun state. A simple random sampling technique in a multi-stage procedure was used to select 40 students from each of the six sampled schools from three local governments. Using true-experimental research with pre-test, post-test, control group design, two data collection instruments and three instructional guides were used in this study. The findings from the study revealed that there was a significant effect of self-learning instructional package on secondary schools' students' academic achievement in Government ( $F = 1479.72$ ,  $p = 0.00$ ;  $p < 0.05$ ) in Ogun state. there is a significant ( $p < 0.05$ ) main effect of treatment on students' academic achievement in Government with students in the ICT based self-learning instructional package group achieving significantly better than those in the control group. there is a significant ( $p < 0.05$ ) effect of gender on students' academic achievement in Government with male students achieving significantly better than female students. It was concluded that; there was a significant effects of self-learning instructional package on secondary schools' students' academic achievement in Government. The study recommended that: Schools should adopt ICT-based self-learning instructional packages for teaching Government; Government should invest in regular training programs for teachers to effectively integrate ICT tools into their teaching methodologies; Government should also ensure that schools are well-equipped with the necessary ICT infrastructure, including computers, internet access, and appropriate software; Principals should encourage the use of ICT-based instructional packages to foster positive attitudes towards subjects like Government. The teachers should regularly gather and analyze student feedback to improve the ICT-based learning experience and finally, Principals and teachers should tailor teaching methods to accommodate age and needs of the learners.

**Keywords:** *Self learning Instructional Package, Academic Achievement, Government*



## 1. Introduction

Every nation that aspires to achieve exponential and sustainable development places high priority on the education of its citizens. Education serves as a foundational framework for the holistic development of individuals, equipping them to function effectively and meaningfully within society and the global community. It influences various aspects of life social, economic, political, emotional, and psychological thus making knowledge and skill acquisition vital for cultivating an informed, efficient, and responsible citizenry (Omoloso, Fademi, & Popoola, 2017). In Nigeria, one of the most heavily invested levels of education is the secondary school.

Secondary education holds a pivotal role in the Nigerian educational system. As a bridge between primary and tertiary education, it provides learners with advanced knowledge, skills, and character traits (Ige, 2013). It is designed not only to prepare students for higher education but also to equip them for meaningful participation in society (Ige, 2022; Yusuf, 2024). According to the National Policy on Education (2014), the aims of secondary education include offering equal educational opportunities, fostering self-improvement, promoting Nigerian culture, instilling values of citizenship and patriotism, and developing vocational and technical skills essential for national development.

Among the subjects offered in Nigerian secondary schools is Government, categorized under Arts subjects. Government aims to provide students with an understanding of political systems, institutions, and processes, promote civic responsibility, encourage democratic participation, and enhance awareness of Nigeria's role in international affairs (NPE, 2014). The subject equips students with the knowledge to understand governmental structures, exercise civic duties, and become active contributors to national development.

Despite its relevance, student performance in Government has remained suboptimal. Chief Examiner's Reports (2010–2019) consistently highlight issues such as poor comprehension of key topics—public opinion, mass media, public administration, colonial administration, constitutional development, and nationalism. Reports also point to weak English language skills, misinterpretation of questions, shallow understanding, and inability to articulate ideas effectively. These challenges have been attributed, in part, to the continued reliance on traditional teaching methods, which limit students' engagement and independence in learning (Ajayi, 2023).

To address these challenges, there is a growing need to integrate Information and Communication Technology (ICT) into the teaching and learning of Government. ICT-based self-learning instructional packages enable students to learn independently at their own pace using multimedia resources such as videos, interactive modules, simulations, and quizzes. These tools enhance comprehension, sustain student motivation through gamification elements, and provide instant feedback to guide learners' progress. Moreover, they improve students' digital literacy and critical thinking skills essential for 21st-century learning.

Such packages promote personalized and collaborative learning. Students can share resources, engage in peer discussions, and undertake group projects via digital platforms. Adaptive technologies further ensure content is tailored to learners' progress, helping bridge learning gaps by allowing repeated access to complex topics. Simulation exercises, like mock parliamentary debates, also immerse students in real-world political scenarios, enhancing their grasp of



governmental functions (Miller, 2019). Additionally, digital resources such as e-books and online articles provide current information on political events and policies, facilitating deeper understanding of government issues (Brown & White, 2018).

Gender is another factor influencing learning outcomes. While some studies suggest that male students outperform females in science-related subjects (Ige, 2016; Nnama, 2023), others argue there is no significant gender difference overall (Akinsola, 2012). Lahey (2022) found that female students tend to excel in language-based tasks, while males perform better in technical subjects. These mixed findings imply that academic performance is influenced by multiple interrelated factors, including subject matter and individual learning styles.

Given the numerous benefits of ICT-based instruction and the persistent challenges in Government education, this study investigates the impact of ICT-based self-learning instructional packages on enhancing the teaching and learning of Government in public secondary schools in Ogun State. It aims to assess how these digital tools improve students' understanding, promote engagement, and foster independent learning. The study will also explore students' and teachers' perceptions of ICT integration, identify implementation challenges, and offer recommendations for optimizing its use. Ultimately, this research seeks to provide practical insights into the modernization of Government education through technology-enhanced learning.

## **Statement of the Problem**

The knowledge of Government is essential to the citizens of any nation. This is because the subject offers knowledge on the way Government of all nations should be run. The knowledge of Government is also essential for the learning of Political Science, Law and related courses in the University. Hence, effective learning of the subject at the secondary school level is not only foundational but also important to societal development. However, despite the aforementioned importance of Government, the students' academic achievement, particularly in Ogun State public secondary schools, has been notably poor. In view of this, the Chief Examiner's reports (2010 – 2019) revealed that students' achievement on government over the years, especially in the areas including public opinion, mass media, public administration, pre-colonial political system in Nigeria, colonial administration, nationalism, constitutional development in Nigeria, development of political parties in Nigeria, election and franchise, among others, students have shown poor grasp of the contents of Government. They have consistently misrepresented their thoughts on questions and were unable to conscientiously write responses to answers as required from them. Their inability to effectively answer the questions on the topics manifested in their poor grammatical expression and inability to articulate their ideas. According to the observations of the researcher, while so many other subjects, especially Science subjects enjoy serious technological innovations and integration in their teaching and learning, this is not the case with the subject of Government in secondary schools. Hence, there is a general dearth of specialized ICT-based instructional packages for the teaching and learning of Government.

In view of the above background, introducing technological innovative approach to learning Government through the use of ICT-based packages will go a long way in assisting not just students to learn effectively but will also ensure that the contents of Government as a subject are made available in ICT-based formats. It is in view of this that this study proposes to develop an



ICT-based instructional package for teaching and learning of Government in senior secondary schools in Ogun State.

## 2. Objectives of the study

This study investigated the effect of ICT-based instruction (self-learning instructional package) on the academic achievement of senior secondary school students in the Government in Ogun State. Specifically, the study determined:

- i. The significant main effect of treatment on public secondary school students' academic achievement in the Government of Ogun State, Nigeria.
- ii. The significant main effect of gender on students' academic achievement scores in Government in public secondary schools in Ogun State, Nigeria
- iii. The significant interaction effect of treatment and gender on students' academic achievement scores in Government in public secondary schools in Ogun State, Nigeria.

## Hypotheses

The following hypotheses were formulated and tested at the 0.05 level of significance:

- i. HO1: There is no significant main effect of treatment on public secondary school students' academic achievement in Government in Ogun state, Nigeria.
- ii. HO2: There is no significant main effect of gender on students' academic achievement scores in Government in public secondary schools in Ogun State, Nigeria.
- iii. HO3: There is no significant interaction effect of treatment and gender on students' academic achievement in Government in public secondary schools in Ogun State, Nigeria.

## 3. Theoretical Framework

There are several theories concerning Information and Communication Technology, which can enhance students' performance in word processing. For this study, constructivism was adopted.

Constructivism, rooted in Jean Piaget's theory of cognitive development, emphasizes that learners actively construct knowledge based on prior experiences and interactions within their social and cultural environment. Learning is seen as a process of meaning-making, where students build mental models or "schemes" that evolve with new experiences. Vygotsky's concept of the Zone of Proximal Development (ZPD) further supports the idea that learners can achieve more through guided interaction with teachers or more capable peers. Social constructivism highlights the importance of collaboration, scaffolding, and active participation in learning. This theory operates on key principles: learning begins with meaningful questions, understanding comes from grasping both parts and wholes, educators must recognize students' mental models, and true learning is about constructing personal meaning rather than memorizing facts. Assessment should reflect the quality of understanding rather than rote correctness.



In practice, constructivism is applied through strategies like scaffolding, inquiry-based learning, and problem-solving activities that promote autonomy and deeper understanding. According to Kanno, 2018, inquiry learning involves observation, questioning, investigation, and communication of results. In the study of Government, constructivism allows students to connect new knowledge with prior learning, engage in collaborative tasks, and develop critical thinking skills. ICT-based tools enhance this process by encouraging self-paced, interactive learning. The approach also fosters confidence, teamwork, and problem-solving abilities, making it effective for improving students' academic performance (Kanno, 2018).

#### **4. Literature Review**

Several studies have demonstrated the positive impact of ICT and instructional packages on students' academic performance. Nseabasi and Uyai (2023) reported that digital learning technology enhanced academic achievement in Computer Science among college students in South-South Nigeria. Ogunlade and Omodara (2022) observed low teacher utilization of multimedia resources for teaching Government in Ekiti State, advocating for more training. Abdulmuminu (2021) concluded that interactive computer software significantly boosted Political Science students' performance across gender groups. Gladys (2021) reported that effective ICT use by science pre-service teachers in Jalingo was hindered by poor availability and adequacy of ICT resources, highlighting a strong correlation between resource availability and utilization.

Ishtiaq and Qaiser (2022) confirmed that ICT enhanced both academic achievement and retention in Chemistry among 9th graders. Fakomogbon et al. (2012), Özkök (2013), and Thongmee et al. (2015) validated the quality and effectiveness of web-based instructional models in improving student outcomes. Laleye (2016) and Çepni (2006) supported CAI's role in boosting learning, particularly in higher-order cognitive domains. Yusuf and Afolabi (2010), Efe and Efe (2011), and Owusu (2009) found CAI especially effective for low-achieving students, though it may be time-consuming and less effective for complex problem-solving. Odcházellová (2015) emphasized the need for teacher awareness to maximize ICT benefits, while Angadi and Ganihar (2015) linked ICT to enhanced knowledge construction. Klein and Koroghlanian (2004) highlighted the influence of spatial ability and animation on learner engagement and achievement in ICT environments.

Ali et al. (2014) cautioned that technology supports but does not determine learning, while McLaughlin and Arbeider (2008) advocated for interactive, research-based ICT tools. Ahmad (2010) noted that ICT aids concept delivery through multimodal presentation, improving retention. While Alhassan (2012) observed gender differences in CAI outcomes, Salahudeen (2012) and Yusuf and Afolabi (2010) found no significant gender-based disparities. Ofuani (2014), Isola (2010), Oluwagbohunmi and Abdu-Raheem (2014), and Abdu-Raheem (2011) underlined the importance of adequate instructional packages for teaching effectiveness. Ahmed (2003) and Eniayewu (2005) criticized the poor learning environments in many Nigerian schools due to lack of resources.

Adeogun (2001, 2022) and Babayomi (1999) found strong links between instructional resource availability and student performance, noting that private schools outperformed public ones due





to better resources. Chonjo (1994) in Tanzania similarly concluded that physical facilities and adequate teaching materials are essential for quality education and improved performance.

## 5. Research Methodology

This study adopted a pre-test, post-test non-equivalent control group quasi-experimental design, as participants were not randomly assigned to groups. The design is represented as follows:

**Table 4.1: Research Design**

| Group | Pre-test | Treatment | Post-test |
|-------|----------|-----------|-----------|
| E1    | O1       | X1        | O3        |
| E2    | O2       | X2        | O4        |

Where:

E1 = Experimental group, E2 = Control group

O1, O2 = Pre-tests, O3, O4 = Post-tests

X1 = ICT-Based Self-Learning Instructional Package, X2 = Conventional Instructional Method

The study population comprised 7,321 public senior secondary school students in Ogun East Senatorial District, Ogun State. A sample of 240 students was selected through multistage sampling. Three Local Government Areas—Ijebu-Ode, Ijebu North East, and Odogbolu—were selected. Two public secondary schools were purposively chosen from each LGA, and 40 students were randomly selected from each school.

Three instruments were used: the ICT-Based Self-Learning Instructional Package (IBSLIP), the Conventional Instructional Method (CIM), and the Government Achievement Test (GAT). The IBSLIP was developed with the help of a computer programmer and was used for the experimental group. The CIM involved traditional classroom tools like chalkboards, calendars, pictures, and textbooks, without electronic aids. The GAT comprised 30 multiple-choice items adapted from relevant SSCE past questions, vetted by the researcher's supervisors and two Government teachers.

Instrument validity was ensured through expert review for face, content, and construct validity. Reliability was established using the test-retest method on 20 non-sample SS II Government students. The resulting reliability coefficients were 0.73 (IBSLIP), 0.81 (CIM), and 0.76 (GAT), indicating acceptable reliability.

Data collection lasted four weeks. An introductory letter was presented to selected school principals for permission. In the first week, the pretest (GAT) was administered to both groups.



Over the next three weeks, the experimental group was taught using IBSLIP, while the control group received traditional instruction. After the treatment period, both groups took the post-test.

Data were analyzed using descriptive statistics (mean and standard deviation) to address the research questions, and inferential statistics (Analysis of Covariance, ANCOVA) to test hypotheses at the 0.05 significance level.

## 6. Data analysis and discussion

**Hypothesis One:** There is no significant main effect of treatment on public secondary school students' academic achievement in Government in Ogun state, Nigeria.

**Table 4.2: Analysis of Covariance Showing the Effect of Treatment on Students' Academic Achievement in Government**

| Source             | Type III<br>Sum of<br>Squares | Df       | Mean Square      | F              | Sig.        |
|--------------------|-------------------------------|----------|------------------|----------------|-------------|
| Corrected Model    | 18250.655 <sup>a</sup>        | 4        | 4562.664         | 72.858         | .000        |
| Intercept          | 14823.655                     | 1        | 14823.655        | 236.708        | .000        |
| PRE-TEST           | 66.464                        | 1        | 66.464           | 1.061          | .304        |
| <b>TREATMENT</b>   | <b>13151.359</b>              | <b>1</b> | <b>13151.359</b> | <b>210.004</b> | <b>.000</b> |
| GENDER             | 596.991                       | 1        | 596.991          | 9.533          | .002        |
| TREATMENT * GENDER | 1469.040                      | 1        | 1469.040         | 23.458         | .000        |
| Error              | 11209.758                     | 169      | 62.624           |                |             |
| Total              | 431230.000                    | 180      |                  |                |             |
| Corrected Total    | 29460.413                     | 179      |                  |                |             |

Result presented in table 3 shows F-value of 210.004 with p-value of 0.00 for the effects of treatment on academic achievement. Since the p-value is less than the Alpha level of significance ( $p < 0.05$ ), the null hypothesis is hereby rejected. This result indicates that there is a significant main effect of treatment on students' academic achievement in Government with students in the ICT based self-learning instructional package group achieving significantly better than those in the control group.

**Hypothesis Two:** There is no significant main effect of gender on student's academic achievement in Government in public secondary schools in Ogun State, Nigeria.



**Table 4.3: Analysis of Covariance Showing the Effect of Gender on Students' Academic Achievement in Government**

| Source             | Type III Sum of Squares | Df       | Mean Square    | F            | Sig.        |
|--------------------|-------------------------|----------|----------------|--------------|-------------|
| Corrected Model    | 18250.655 <sup>a</sup>  | 4        | 4562.664       | 72.858       | .000        |
| Intercept          | 14823.655               | 1        | 14823.655      | 236.708      | .000        |
| PRE-TEST           | 66.464                  | 1        | 66.464         | 1.061        | .304        |
| TREATMENT          | 13151.359               | 1        | 13151.359      | 210.004      | .000        |
| <b>GENDER</b>      | <b>596.991</b>          | <b>1</b> | <b>596.991</b> | <b>9.533</b> | <b>.002</b> |
| TREATMENT * GENDER | 1469.040                | 1        | 1469.040       | 23.458       | .000        |
| Error              | 11209.758               | 169      | 62.624         |              |             |
| Total              | 431230.000              | 180      |                |              |             |
| Corrected Total    | 29460.413               | 179      |                |              |             |

Result presented in table 4 shows F-value of 9.533 with p-value of 0.002 for effect of gender on students' academic achievement in Government. Since the p-value of 0.002 is less than the Alpha level of significance ( $p < 0.05$ ), the null hypothesis of significant effect of gender is hereby rejected. This result indicates that there is a significant effect gender of on students' academic achievement in Government with male students achieving significantly better than female students.

**Hypothesis Three:** There is no significant interaction effect of treatment and gender on student's academic achievement in Government in public secondary schools in Ogun State, Nigeria.

**Table 4.4: Analysis of Covariance Showing the Interaction Effect of Treatment and Gender on Students' Academic Achievement in Government**

| Source                    | Type III Sum of Squares | Df       | Mean Square     | F             | Sig.        |
|---------------------------|-------------------------|----------|-----------------|---------------|-------------|
| Corrected Model           | 18250.655 <sup>a</sup>  | 4        | 4562.664        | 72.858        | .000        |
| Intercept                 | 14823.655               | 1        | 14823.655       | 236.708       | .000        |
| PRE-TEST                  | 66.464                  | 1        | 66.464          | 1.061         | .304        |
| TREATMENT                 | 13151.359               | 1        | 13151.359       | 210.004       | .000        |
| GENDER                    | 596.991                 | 1        | 596.991         | 9.533         | .002        |
| <b>TREATMENT * GENDER</b> | <b>1469.040</b>         | <b>1</b> | <b>1469.040</b> | <b>23.458</b> | <b>.000</b> |
| Error                     | 11209.758               | 169      | 62.624          |               |             |





|                 |            |     |
|-----------------|------------|-----|
| Total           | 431230.000 | 180 |
| Corrected Total | 29460.413  | 179 |

Result in table 5 shows that the F-value of 23.458 with p-value of 0.000 for the interaction effect of treatment and gender on students' academic achievement in Government. Since the p-value is less than the Alpha level of significance ( $p < 0.05$ ), the null hypothesis of no significant interaction effect is hereby rejected. This result means that there is a significant interaction effect of treatment and gender on students' academic achievement in Government. It means that a combination of treatment and gender significantly affect the academic achievement of students in word Government with male students in the ICT based self-learning instructional package group achieving significantly better than other categories of students but female students in the control group performed better than male students in the same group.

The finding from hypothesis one shows that there is a significant main effect of treatment on students' academic achievement in Government with students in the ICT based self-learning instructional package group achieving significantly better than those in the control group. This result is consistent with the report of Harris, Al-Bataineh, and Al-Bataineh (2016) that the Implementation of technology based self-learning yielded a significantly higher than the conventional method. Also, the finding of Awofala and Agbolade (2024) that there is a significant main effect of treatment on secondary school students' achievement in mathematics is also in tandem with the result of this finding.

The finding from hypothesis two means that there is a significant interaction effect of treatment and gender on students' academic achievement in Government. It means that a combination of treatment and gender significantly affect the academic achievement of students in word Government with male students in the ICT based self-learning instructional package group achieving significantly better than other categories of students but female students in the control group performed better than male students in the same group. The result is in tandem with the report of Peter (2014) that there was significant interaction effect of treatment and gender on students' academic performance in Social Studies. It is also in tandem with the report of Osuafor and George (2021) that there is significant interaction effect of instructional approach and gender on students' achievement in chemistry. The result disagrees with the finding of Okeke (2018) that there was no significant interaction effect of gender and treatment on student's achievement and retention.

71

## 7. Conclusion and Recommendations

The study inferred from the findings that the use ICT based self-learning instructional package was more effective in enhancing students' academic achievement in Government than the conventional lecture method which implies that there is a significant effect of ICT based self-learning instructional package on students' academic achievement in Government. The study



also concludes that used of ICT based self-learning instructional package as innovative teaching technologies in enhancing students' academic achievement in Government. It was also concluded that the use of ICT based self-learning instructional package was gender sensitive because there was significant effect of gender on both students' achievement in Government. Finally, the combination of treatment and gender significantly affect the academic achievement of students in Government with male students in the ICT based self-learning instructional package group achieving significantly better than other categories of students but female students in the control group performed better than male students in the same group.

The following recommendations were presented based on the results and conclusion of the study:

Schools should adopt ICT-based self-learning instructional packages for teaching Government and other subjects. This approach can enhance student performance and make learning more engaging.

Government should invest in regular training programmes for teachers to effectively integrate ICT tools into their teaching methodologies.

Government should also ensure that schools are well-equipped with the necessary ICT infrastructure, including computers, internet access, and appropriate software

Principals should encourage the use of ICT-based instructional packages to foster positive attitudes towards subjects like Government. This can be achieved by incorporating interactive and engaging content.

## 8. References

- Abdu – Raheem, B. O. (2021). Availably, adequate and utilization of social studies.IM in Ekiti State secondary school. *Journal of Current Discourses Research*, 3: 242 – 255
- Afolabi, S.S., & Adeleke, J.O. (2010). Assessment of resources and instructional materials status in the teaching of mathematics in south western Nigeria. *European Journal of Scientific Research*, 4(1): 406-410.
- Ahmad, M. I. (2010) Effectiveness of Innovative and Traditional Method of Teaching Biology in Junior College Students. *Shodh Samiksha Aur Muhyankan*, 2(18): 35-36.
- Ahmed, T. M. (2003). Education and national development in Nigeria. *Journal of Studies in Education*, 10: 35-46.
- Ajayi, O. T., & Omotayo, O. D. (2023). Perceived usefulness and ease of use as determinants of students' attitudes towards ICT in Nigerian universities. *Journal of Educational Research and Development*, 11(1), 101-117.
- Alhassan, D. S. (2012). Effects of Computer Assisted Instructional Package on Achievement and Retention in Geometry among Junior Secondary School Students in Minna Metropolis. *Unpublished M. Tech. Thesis F.U.T, Minna*. 15



- Ali, A. R., Toriman, M. E., & Gasim, M. B. (2014). Academic Achievement in Biology with Suggested Solutions in Selected Secondary Schools in Kano State, Nigeria. *International Journal of Education and Research*, 2 (11): 217-218
- Angadi, G. R., & Ganihar, N. N. (2015). Development and validation of multimedia package in Biology. Bridge Center, 2015. *Bridge Center, Buzau, Romania European Union. p16*. Retrieved on September, 2017 from <http://dx.doi.org/10.6084/m9.figshare.1417929>
- Brown, R. & White, T. (2018). Instructional packages and learning achievement, *Science Direct Journal*, 4(7), 1-12
- Çepni, S., Tas, E. & Köse, S. (2006). The Effects of computer-assisted material on pupils' cognitive levels, misconceptions and attitudes towards science. *computer and education*, 46 (2): 192–205.
- Efe, H. A., & Efe, R. (2011). Evaluating the effects of computer simulations on secondary biology instruction: An application to bloom's taxonomy. *Academic Journal on Scientific Research and Essays*, 6(10): 2137-2146.
- Fakomogbon, M. A., Shittu, A. T., Omiola, M. A., & Morakinyo. O. K. (2012). Design, development and validation of a web-based instructional package for teaching ceramics concepts in basic technology for the junior secondary school students in Nigeria. *Interdisciplinary Journal of Contemporary Research in Business*, 3(10): 533 - 541.
- Ige, A. M. (2013). Provision of secondary education in Nigeria: Challenges and way forward. *Journal of African Studies and Development*, 5(1), 1-9,
- Ige, A.M. (2011). Myths and realities of falling standard of education in Nigeria: *The way forward. Niger. J. Prof. Teach.* 2, 36-48.
- Klein, J., & Koroghlanian, C. (2004). The Effect of Audio and Animation in Multimedia *International Journal of Educational Multimedia and Hypermedia*, 13(1), 23-46.
- Laleye, A. M. (2016). Development and validation of a computer- assisted instructional package for learning basic science in Nigeria. *Journal of Science, Technology, Mathematics and Education, (JOSTMED)*, 12(1), 241-257.
- McLaughlin, J. & Arbeider, D. A. (2008). Evaluating multimedia-Learning Tools Based on Authentic Research Data that Teach Biology Concepts and Environmental Stewardship. *Contemporary Issues in Technology and Teacher Education*, 8 (1): 14
- Miller. D. S. (2019). Reclaiming instructional design. *Educational Technology*, 36 (5), 5–7.
- National Policy on Education (2004) (Revised). Abuja, Nigeria: *Nigerian Educational Research and Development Council Federal Republic of Nigeria Gazette (2004). No. 66(91):8 113- A124*.
- Odcházellová, D. (2015). Beliefs of the Biology teachers about using multimedia. 5
- Ofuani, F. N. (2014). Learning environment for literacy development. *Journal of the Reading Association of Nigeria (RAN)*, 15 (2): 301-307.



- Okeke, J. N. (2013). Effect of project-based method on students' achievement in government curriculum in senior secondary schools in Nsukka Education Zone.
- Oluwagbohunmi, M. F. & Abdu – Raheem, B. O. (2014). Sandwich undergraduate problems, problem of improvisation of IM in social studies. The case of Ekiti State University. *Journal of International Academic Research for Multi or Plenary*, 1 (12): 824 – 83.
- Omoloso, M. O., Fademi, K. O. & Popoola, F. F. (2017). Civic Education and Social Influence of Senior Secondary School Students in Ilorin South, Nigeria. *Nigerian Journal of Social Studies*, 20 (2), 182-197
- Owusu, K. A. (2009). Effect of Computer- Assisted Instruction on Senior High School Students' Achievement in Biology. *Unpublished M.Ed. Thesis University of Cape Coast Ghana*. 17
- Özkök, G. A. (2013). Reliability and validity of the Turkish version of the web-based learning environment instrument (WEBLEI). *Journal of Education*, 28(2), 335-347.
- Salahudeen, Y. (2012). Effects of Computer Assisted Instructional Package on Learning of Longitude and Latitude among Secondary School Students in Minna Metropolis. *Minna Journal of Educational Studies (MIJES)*, 5(1): 131 – 138.
- Thongmee, L. T., Ruangsawan, C. & Terdtoon, P. (2015). Development of web-based learning environment model to enhance cognitive skills for undergraduate students in the field of electrical engineering. *Educational Research and Reviews*, 10 (21), 2806 – 2813.
- West African Examinations Council's Senior School Certificate Examination Chief Examiner's Report on Government (2010). Statistics Section, West African Examination Council (WAEC) National Office, Onipanu, Lagos, Nigeria.
- West African Examinations Council's Senior School Certificate Examination Chief Examiner's Report on Government (2011). Statistics Section, West African Examination Council (WAEC) National Office, Onipanu, Lagos, Nigeria.
- West African Examinations Council's Senior School Certificate Examination Chief Examiner's Report on Government (2012). Statistics Section, West African Examination Council (WAEC) National Office, Onipanu, Lagos, Nigeria.
- West African Examinations Council's Senior School Certificate Examination Chief Examiner's Report on Government (2013, 2014, 2015 and 2016). Statistics Section, West African Examination Council (WAEC) National Office, Onipanu, Lagos, Nigeria.
- West African Examinations Council's Senior School Certificate Examination Chief Examiner's Report on Government (2017, 2018 and 2019). Statistics Section, West African Examination Council (WAEC) National Office, Onipanu, Lagos, Nigeria.
- Yusuf, A. (2012). Economics education. Retrieved from: <http://www.musero.org.ng/publications/Economics%20education%20dr%20yusuf%202.pdf>. p67



*International Journal of Business and Technical Education*  
(A Journal of The School of Business Studies, The federal Polytechnic Ado-Ekiti)  
Jacob et al., Vol 1. No. 1, (2025)

<https://sbsijbtefpa.com/index.php/ijbte>

Yusuf, M. O. &Afolabi, A. O. (2010). Effects of Computer Assisted Instruction (CAI) on Secondary School Pupils' Performance in Biology. *The Turkish Online Journal of Educational Technology*, 9 (1), 62–69.