

**STUDENTS' PERCEPTION ON THE ROLE OF ARTIFICIAL INTELLIGENCE (CHAT GPT)
IN SHAPING THE LEARNING OF SCIENCE AMONG SENIOR SECONDARY STUDENTS
IN KADUNA NORTH, NIGERIA**

BY

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Abstract

This study investigated students' perception on the role of artificial intelligence (Chat GPT) in shaping science among senior secondary students in Kaduna North Local Government Area, Nigeria. The research design was a cross-sectional survey research design. The population of the study consisted of eight co-educational schools having a total number of two thousand nine hundred and forty three (2,943) SS III students across the eight secondary schools in Kaduna North Local Government Area. From the population of the study 352 students constituted the sample size for the study. The instrument used for data collection was a structured Students' Artificial Intelligence Opinion Questionnaire (SAIOQ). The reliability coefficient of the instrument was 0.82. The study was guided by two research questions and two null hypotheses tested at the 0.05 level of significance. Descriptive statistics of frequencies and percentages were used to answer research questions, Chi-square (χ^2) statistics was used to test null hypotheses. The result of the finding showed no significant difference between students' perception and the role Chat GPT plays in shaping students' learning in science education. Based on these findings, it is therefore recommended that, science teachers should integrate Chat GPT into classroom instruction as a supplementary learning tool.

Keywords: Perception, Chat GPT, Artificial Intelligence, Science, Secondary School Students

Introduction

Artificial Intelligence (AI) has emerged as one of the most influential technological developments of the twenty-first century, with increasing applications in various sectors which includes the education sector. AI refers to computer-based systems capable of performing tasks that ordinarily require human intelligence, such as learning, reasoning, problem-solving and generating information. According to Ubabuike and Nweke (2024), AI-powered tools are increasingly being used in the education sector to support teaching and learning by providing students with access to information, personalized learning experiences and interactive educational resources. One of the most prominent examples of generative AI is Chat GPT, an AI-powered conversational tool developed to understand and generate human-like responses to users' questions and instructions as reported by Chukwuere (2024). The integration of Chat GPT into education has attracted considerable attention because of its potential to transform conventional teaching and learning practices. Students can use Chat GPT to obtain explanations of difficult concepts, summarize learning materials, and receive assistance with academic tasks. In science education, where students are expected to comprehend abstract concepts, conduct investigations, solve problems, and apply scientific principles, AI tools such as Chat GPT may provide additional learning support (Ali & Habib, 2020). The technology can explain complex scientific concepts in simpler language, respond to students' questions, provide examples, and encourage independent learning beyond the traditional classroom environment. Science plays an important role in the educational development of secondary school students because it equips learners with scientific knowledge, skills, attitudes, and problem-solving abilities needed to understand the environment and contribute to national development. Subjects such as Biology, Chemistry and Physics, require students to develop both theoretical understanding and practical reasoning skills. However, science education in many developing educational settings continues to face challenges, among which include; inadequate instructional materials, large class sizes, limited access to laboratory facilities and differences in students' learning abilities. The availability of AI-powered educational tools therefore presents both opportunities and concerns regarding how students learn and engage with science (Akintokun & Bolarinwa, 2025). Despite the potential benefits of Chat GPT, its use in education has generated debates concerning accuracy, academic integrity, over dependence on technology, critical-thinking skills, and students' ability to distinguish reliable information from incorrect or misleading responses. Since Chat GPT generates responses based on patterns in its training and does not guarantee that every response is factually correct, students may sometimes receive inaccurate scientific information (Araba, Alabi, & Okojie, 2022). Excessive dependence on the technology may also reduce students' motivation to

independently research, reason, solve problems, or develop their own ideas. Conversely, when used responsibly and under appropriate guidance, Chat GPT may serve as a supplementary learning resource rather than a replacement for teachers or conventional educational materials (Araba, Alabi, & Okojie, 2022).

Students' perceptions are particularly important in determining how effectively AI can contribute to learning science. Perception influences whether students accept, trust, use, or reject a technological tool. Students who perceive Chat GPT as useful and easy to use may be more willing to incorporate it into their learning activities, while those who are concerned about its reliability or ethical implications may use it cautiously. Understanding students' perceptions can therefore provide valuable information about the extent to which Chat GPT is influencing their learning experiences and engagement with science subjects (Aghogho, Oladayo & Tsetimi, 2025). In Nigeria, the growing availability of digital technologies has created new possibilities for improving educational practices, although access to reliable internet services, digital devices, and technological skills remains uneven. Kaduna North Local Government Area, like many urban educational communities in Nigeria, comprises senior secondary school students with varying levels of access to digital learning technologies. Investigating how students perceive the role of Chat GPT in science is therefore important for understanding both the opportunities and challenges associated with the adoption of generative AI in secondary schools. The study, therefore, focuses on students' perception of the role of Artificial Intelligence, particularly Chat GPT, in shaping the learning of science among senior secondary students in Kaduna North, Nigeria. By examining students' views regarding the usefulness and possible influence of Chat GPT on science learning, the study seeks to contribute to the growing discussion on the responsible integration of AI into Nigerian education. The findings may provide useful information for teachers, school administrators, education policymakers, parents, and other stakeholders in developing appropriate strategies for using AI technologies to support effective science teaching and learning while minimizing their potential negative effects.

Theoretical Framework

This study is anchored on The Technology Acceptance Model (TAM), developed by Davis (1989), to explain and predict users' acceptance and use of information technology. The model is based on the assumption that an individual's decision to use a particular technology is largely influenced by what the individual believes about the technology, particularly whether it is useful and easy to use. Davis originally identified Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) as two major

determinants of technology acceptance. TAM was developed from the broader Theory of Reasoned Action (TRA), which proposes that an individual's behaviour is influenced by behavioural intentions, while behavioural intentions are influenced by attitudes and beliefs. Davis adapted this logic to explain users' acceptance of computer technologies. Perceived Ease of Use (PEOU) refers to the extent to which a person believes that using a particular technology will be free from effort. A technology that students find simple to access, understand and operate is more likely to be accepted. In relation to Chat GPT, students may perceive it as easy to use because they can enter a question or instruction into the system and receive a response within seconds. Perceived ease of use for senior secondary school students, may include: ease of creating or accessing a Chat GPT account; ease of entering questions or prompts; ease of understanding Chat GPT responses and ease of asking follow-up questions. TAM is particularly relevant to the study because Chat GPT is an emerging educational technology whose acceptance depends partly on students' perceptions of its usefulness, ease of use and associated risks. The present study focuses on: "students' perception on the role of artificial intelligence (Chat GPT) in shaping the learning of science education among senior secondary students in Kaduna North Local Government Area, Nigeria." Hence, TAM is applied to the study by linking the major TAM constructs to the role of artificial intelligence (Chat GPT) students experience when using Chat GPT.

Statement of the Problem

Despite the growing use of Chat GPT among students, there is limited empirical research examining its role in shaping learning, research, and scientific writing among secondary school students in Kaduna North Local Government Area, Kaduna State. Many students rely on AI tools for solving assignments and generating academic content without fully understanding the scientific concepts involved. This raises concerns about academic integrity, creativity, and critical thinking in science. In addition, teachers and school administrators face challenges in regulating the use of AI technologies (Chat GPT) in classrooms due to the absence of clear policies and guidelines. Therefore, this study seeks to investigate how Chat GPT influences students' learning behaviors in science. The study is expected to provide evidence to Kaduna State Ministry of Education that would contribute to the development of appropriate school-level AI-use guidelines for the responsible integration of Chat GPT into science.

Objectives of the Study

The objectives of this study are to:

1. Examine students' perceptions on the role of Chat GPT in shaping students' learning in science in Kaduna North LGA.

2. To examine students' perceptions on if Chat GPT does more harm than good in the learning process in Science.

Research Questions

1. What is the perception of secondary schools students on the role Chat GPT plays in shaping students' learning in science in Kaduna North LGA?
2. What is the perception of secondary schools students on Chat GPT doing more harm than good in the learning process in Kaduna North LGA?

Null Hypotheses

1. There is no significant difference between students' perception and the role Chat GPT plays in shaping students' learning in science in Kaduna North LGA
2. There is no significant difference between students' perception on whether Chat GPT does more harm than good in the learning process in Science in Kaduna North LGA

Research Design for the Study

This study adopted a cross-sectional survey research design which involves collecting data from a sample of respondents at one point in time to examine the current status of a phenomenon. The design was considered appropriate for this study because it enabled the researcher to gather information on students' perception on the role of artificial intelligence (Chat GPT) in shaping the learning of science among senior secondary students in Kaduna North Local Government Area, Nigeria and supported the use of the Students' Artificial Intelligence Opinion Questionnaire (SAIOQ).

Study Area

The study was conducted in Kaduna North Local Government Area, located in the northwestern region of Nigeria and serves as an important urban and administrative center within the state. The Local Government Area is part of Kaduna metropolis and is known for its educational institutions, commercial activities, and diverse population. The choice of Kaduna North Local Government Area for this study was based on its high concentration of secondary schools and the increasing exposure of students to digital technologies. In addition, the area provides a relevant environment for examining how artificial intelligence influences students' learning in science.

Population of the Study

The population of this study consisted of all SS 3 science students in eight (8) co-educational public secondary schools within Kaduna North LGA, Nigeria. The total number of the SS 3 students from the

eight co-educational public schools is two thousand nine hundred and forty three (2,943) students across the eight secondary schools in Kaduna North LGA. From the total population, one thousand, four hundred and seventy seven (1,477) were males while one thousand four hundred and sixty six (1,466) were females. The choice of SS 3 was considered appropriate for the study because the SS 3 students had considerable knowledge of computer and the internet. The details of the study population are present in Table 3.1.

Table 3.1: Population of the Study

S/N	School	Gender		Total
		Males	Females	
1.	GSS Unguwan Rimi	132	155	287
2.	GSS Badarawa	272	311	583
3.	GSS (Senior) Kawo	330	257	587
4.	GSS Rafin Guza	198	240	438
5.	Kaduna Capital School	21	19	40
6.	Special Education Kaduna	28	24	52
7.	GSS Unguwan Shanu	169	246	415
8.	GSS Hayin Banki	327	214	541
	Total	1,477	1,466	2,943

Source: Kaduna State Ministry of Education (2024)

Sample and Sampling Techniques

- **Sample of the Study**

The sample for this study consisted of three hundred and fifty two (352) SS 3 Science students selected from public senior secondary schools in Kaduna North Local Government Area. The study focused on the challenges associated with the use of Chat GPT and measures for enhancing the responsible use of AI tools in Science in senior secondary schools in Kaduna North, the target respondents included students offering science related subjects such as Biology, Chemistry, Physics, and Mathematics at secondary school level.

- **Sampling Technique**

The study adopted a multistage sampling technique, involving purposive sampling and simple random sampling methods. Purposive sampling was first used to select co-educational secondary schools with science students and access to digital learning tools or internet facilities in Kaduna North. This technique was considered appropriate because the study specifically focuses on students who are likely to have exposure to artificial intelligence tools such as Chat GPT. After selecting the schools, simple

random sampling was used to select the students who participated in the study. This was done by balloting; the method involved writing the words “Yes” or “No” on a sheet of paper and put in a container. The container was shaken thoroughly and continuously after which the students from the selected co-educational secondary schools were asked to pick. Only students who picked yes, were recruited for the study. This method gives every science student an equal chance of being selected, thereby reducing bias and ensuring fairness in the selection process.

- **Sample Size Determination**

The sample size for this study was determined using the Taro Yamane (1967) formula for finite population:

$$n = \frac{N}{1 + N(e)^2}$$

Where

n = Sample size

N = Population size

e = Level of significance set at 0.05

The formula was considered appropriate because it provides a reliable method for determining sample size in survey research.

Substituting into the formula:

$$n = \frac{2,943}{1 + 2,943(0.05)^2}$$

$$n = \frac{2,943}{1 + 2,943(0.0025)}$$

$$n = \frac{2,943}{1 + 7.36}$$

$$n = \frac{2,943}{8.36}$$

$$n = \frac{2,943}{8.36}$$

$$n = 352$$

From the calculation, therefore the minimum sample size collected was 352

Instrumentation

The research instrument developed by the researcher for the purpose of data collection was a structured Students' Artificial Intelligence Opinion Questionnaire (SAIOQ). The SAIOQ contained 30 - items and had two sections; A and B. Section A was on socio-demographic data of the students while section B comprised of questions on students' perception on the role of artificial intelligence (Chat GPT) in shaping the learning of science among senior secondary students in Kaduna North Local Government Area.

a) Validation of Students' Artificial Intelligence Opinion Questionnaire (SAIOQ)

The Students' Artificial Intelligence Opinion Questionnaire (SAIOQ) was given to experts from the Department of Science Education, Kaduna State University, with a minimum qualification of Ph.D. and also to experts from ICT Department of Kaduna State University. The experts critically checked the content of the instrument to ascertain the appropriateness of the items; whether the test items conform to the subject matter to be tested.

Reliability of Students' Artificial Intelligence Opinion Questionnaire (SAIOQ)

The reliability of the Students' Artificial Intelligence Opinion Questionnaire (SAIOQ) was determined by adopting the Split half reliability method for measurement of the reliability coefficient and internal consistency index of items within the instrument. The reliability coefficient was estimated using the Cronbach Alpha. From the result obtained, the reliability coefficient of the instrument was 0.82.

Ethical Consideration

Ethical approval was sought from the relevant authorities such as; Kaduna State Ministry of Education, science teachers and school administrators to obtain permission from the selected senior secondary schools before data collection begun. Participation in the study was voluntary. The purpose, procedures, potential benefits, and nature of the study was clearly explained to the participants before administering the research instrument. Participants were informed that they have the right to decline participation or withdraw from the study at any stage without penalty or negative consequences. A particular attention was given to informed consent and assent. Participants that were below the age of 18 years, appropriate consent from their parents or guardians and assent from the students were obtained in accordance with institutional and ethical requirements. The researcher ensured that participation does not interfere

unnecessarily with students' academic activities. Confidentiality and anonymity were strictly maintained. Every information obtained was used solely for the purpose of the research and was not disclosed to unauthorized persons. Data was securely stored and accessed only by the researcher and authorized research personnel.

Collection Procedure

The questionnaires were administered to the students to assess their opinion on the role of artificial intelligence (Chat GPT) in shaping students' learning in science. Four possible responses were given by the students which included Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) by ticking the correct option.

Procedure for Data Analysis

To answer the Research Questions, frequencies and percentages were used. To test Null the Hypotheses, Chi-square statistics was used.

Results and Discussion

Research Question 1: What is the perception of secondary schools students on the role Chat GPT plays in shaping students' learning in Science in Kaduna North LGA?

To answer research question 1, frequencies and percentages were used. The summary is presented in Table 1.

Table 1: Summary of Frequencies and Percentages of Students' Perception on the Role Chat GPT Plays in Shaping Students' Learning in Science

Some Roles of Chat GPT	Frequency	Percent
Provides Instant Access to Information	167	47.4
Enhances Understanding of Complex Topics	25	7.1
Supports Homework and Assignment Completion	37	10.5
Encourages Self-Paced Learning	21	6
Assists in Exam Preparation	12	3.4
Increases Digital Literacy	20	5.7
Improves Writing and Communication Skills	20	5.7
Promotes Creativity and Critical Thinking	13	3.7
Promote Academic Integrity	20	5.7
Encourages Independent Research	17	4.8
Total	352	100

Table 1 showed responses on students' perception on the role Chat GPT plays in shaping students' learning in science in Kaduna North. It showed that a total of 167 (47.4%) respondent said it provides instant access to information, while 25 (7.1%) said it enhances understanding of complex topics. 37 respondents representing 10.5% that said Chat GPT supports homework and assignment completion, 21 (6.0%) said Chat GPT encourages self-paced learning, 12 (3.4%) said Chat GPT assists in examination preparation. 20(5.7%) respondents said Chat GPT increases digital literacy, another 20 (5.7%) said Chat GPT improves writing and communication skills, 13 (3.7%) said Chat GPT promotes creativity and critical thinking, 20 (5.7%) that said Chat GPT promotes academic integrity while 17 (4.8%) said Chat GPT encourages independent research. In summary the highest responses to the role Chat GPT plays in shaping students' learning in science in Kaduna North was; provides instant access to information while the least response was; assists in examination preparation. However, the statistical validity of these responses is left for the test of the related hypothesis of the study.

Null Hypothesis One: There is no significant difference between students' perception and the role Chat GPT plays in shaping students' learning in science in Kaduna North LGA

To test Null Hypothesis one, Chi-square statistic (χ^2) was used on responses on the role Chat GPT plays in shaping students' learning in science in Kaduna North. The summary of the analysis is presented in Table 2.

Table 2: Chi-square Statistics (χ^2) on Students' Perception on the Role Chat GPT Plays in Shaping Students' Learning in Science

Variable	Frequency Y	Frequency N	Total responses	Df	χ^2 Computed	χ^2 critical	p- value	Remarks
Role Chat GPT plays	200	152	352	1	14.11	16.91	0.08	N.S
	100.3	251.7						

P-value > 0.05. χ^2 computed < χ^2 critical at df 1

The outcome of the chi-square statistics in Table 2 revealed no significant difference between students' perception and the role Chat GPT plays in shaping students' learning in science in Kaduna North LGA. Reasons being that the p-value of 0.08 is greater than the 0.05 alpha level of significance. The maximum frequencies of the observed values were 200 and 152 for total positive and negative responses respectively while their expected values were 100.30 and 251.7 respectively. Therefore the null hypotheses which states "there is

no significant difference between students' perception and the role Chat GPT plays in shaping students' learning in science in Kaduna North LGA", is hereby accepted and retained.

Research Question Two: What is the perception of secondary schools students on Chat GPT doing more harm than good in the learning process in in Kaduna North LGA?

To answer research question 2, frequencies and percentages were used. The summary is presented in Table 3.

Table 3: Summary of Frequencies and Percentages of Respondent to Is Chat GPT doing more harm than good in the learning process in Science Education

Responses	Frequency	Percentage
Strongly agree	25	7.1
Agree	45	12.8
Disagree	66	18.8
strongly disagree	216	61.4
Total	352	100.0

Table 3 showed the responses on the perception of secondary schools students on if Chat GPT is doing more harm than good in the learning process in science. A total of 25 respondents (7.1%) strongly agreed, Chat GPT is doing more harm than good. 45 respondents (12.8%) agreed Chat GPT is doing more harm than good as 66 (18.8%) disagreed Chat GPT is doing more harm than good and 216 (61.4%) strongly disagreed Chat GPT is doing more harm than good. This indicates that majority of the respondents representing over 61.4% disagreed on Chat GPT doing more harm than good in the learning process in Science. However, the statistical validity of these responses is left for the test of the related hypothesis of the study.

Null Hypothesis Two: There is no significant difference between students' perception on whether Chat GPT does more harm than good in the learning process in Science in Kaduna North LGA

To test Null Hypothesis two, Chi-square statistic (χ^2) was used on students' perspective on Chat GPT doing more harm than good in the learning process in science. The summary of the analysis is presented in Table 4.

Table 4: Chi square (χ^2) Statistics on Students' Perceptions on if Chat GPT does more harm than good in the Learning Process in Science

Variable	SA and A Yes	D and SD No	Total Responses	Df	p-value	Remarks
Chat GPT more harm than good	101	251	352	1	0.004	Sig
	89.35	199.14				

P-value < 0.05. χ^2 computed > χ^2 critical at df 1

Table 4 revealed a significant difference on students' perception on Chat GPT doing more harm than good in the learning process in science. Because the p-value of 0.004 is lower than the 0.05 alpha level of significance. The maximum frequencies of the observed counts were 101 and 251 for total positive (strongly agree and agree) and negative (disagree and strongly disagree) respectively while their expected counts were 89.35 and 199.14 respectively. Therefore the null hypothesis which states that, there is no significant difference on Chat GPT doing more harm than good in the learning process in science, is hereby rejected.

Discussion of Findings

The study examined students' perception on the role of artificial intelligence (Chat GPT) in shaping the learning of science among senior secondary students in Kaduna North Local Government Area, Nigeria. Findings from the study revealed no significant difference between students' perception and the role Chat GPT plays in shaping students' learning in science in Kaduna North LGA. This implies that Chat GPT does not have a specific role which surpasses other roles in shaping students learning in science in Kaduna North. Chat GPT plays vital roles in shaping learning which includes; providing instant access to information, enhancing understanding of complex topics, assisting in examination preparation and promoting creativity and critical thinking to mention a few. The non-significant difference recorded suggests an equal effectiveness of each role of Chat GPT in shaping learning in science education among secondary school students in Kaduna North. This implies that the influence of Chat GPT on science learning was relatively similar among the respondents, regardless of factors such as gender, school type, or other demographic characteristics considered in the study. One possible explanation for this finding is that the use of Chat GPT among secondary school students in Kaduna North may still be at an early stage. In which many students might have limited access to internet-enabled devices, stable electricity, or affordable data services. Thereby, reducing the frequency and effectiveness of Chat GPT use for science learning. Consequently, the educational benefits of Chat GPT may not be sufficiently widespread to create statistically significant differences among students. This findings is similar to the

findings of Aminu, Muhammad, Umar, Idris, Yusuf and Basiru (2024) who investigated the impact of artificial intelligence (Chat GPT) on academic performance of undergraduate students in Nigeria and reported that, while Chat GPT significantly improved students' learning outcomes, there was no significant difference in its effectiveness across educational levels or across different types of knowledge.

The findings of this study, also revealed significant difference between students' perception on whether Chat GPT does more harm than good in the learning process in Science in Kaduna North LGA. The result favored the view that, Chat GPT contributes more positively than negatively to learning. This finding indicates that students generally perceive Chat GPT as a beneficial educational tool that enhances students' understanding of science concepts, supports independent learning and facilitates problem-solving more than it creates negative consequences. The positive perception observed in this study may be attributed to the numerous educational advantages associated with Chat GPT. In science, students often encounter abstract concepts that require repeated explanations and individualized support. Chat GPT provides immediate responses to learners' questions, generates examples and explains scientific principles in simple language. These features enable students to learn at their own pace, thereby increasing confidence, engagement, and motivation in science learning. Consequently, students are more likely to perceive Chat GPT as an educational resource that contributes positively to their academic development. This findings is in agreement with the findings of Nwoye and Okafor (2026), who worked on Artificial intelligence and academic performance of students in public universities in Anambra State and found that Chat GPT significantly improves students' academic performance, enhances affective and motivational outcomes and promotes critical thinking during learning.

Conclusions

From the findings of this study, the following conclusions were made:

1. No significant difference between students' perception and the role Chat GPT plays in shaping students' learning in science in Kaduna North LGA.
2. There is significant difference significant difference between students' perception on whether Chat GPT does more harm than good in the learning process in Science in Kaduna North LGA in favor of the view that, Chat GPT contributes more positively than negatively to learning

Recommendations

On the basis of the findings from this study, the following recommendations are made:

1. Students should also be encouraged to cross-check Chat GPT-generated information with textbooks, teachers and other credible scientific sources.
2. Science teachers should integrate Chat GPT into classroom instruction as a supplementary learning tool. Teachers should incorporate Chat GPT into lesson delivery, assignments, and revision activities to enhance students' understanding of scientific concepts while ensuring that it complements, rather than replaces, teacher-led instruction.

Limitations of the Study

The study has the following limitations:

1. The study is geographically limited to senior secondary schools in Kaduna North LGA only. Therefore, the findings may not be generalized to students in other Local Government Areas of Kaduna State or other parts of Nigeria, where school conditions, access to technology, and students' experiences with artificial intelligence may differ
2. The study involved a limited number of students drawn from selected schools. Although the sample was considered adequate for the study, a larger sample involving more schools and students could provide broader perspectives on students' perceptions of Chat GPT in science learning

Suggestions for further Studies

1. Further studies should be conducted in other Local Government Areas of Kaduna State and other states in Nigeria to determine whether students face similar challenges when using Chat GPT for learning Science Education.
2. Future researchers should compare secondary schools students in urban and rural areas to examine differences in access to Chat GPT, internet facilities, digital devices, and other technological resources.

Reference:

- Aghogho, P.O., Oladayo, E.O. & Tsetimi, O. (2025). Exploring the influence of artificial intelligence on secondary school students' cognitive development and academic achievement in Delta State. *Asian Research Journal of Current Science*, 7(1):38-49.

- Akintokun, O.A., & Bolarinwa, O.T. (2025). Perceived impact of artificial intelligence as a science education tool for enhancing a change in academic experience. *Journal of Theoretical and Empirical Studies in Education*, **10**(1), 12-25.
- Ali, M., & Habib, M. (2020). Technology utilization in African classrooms: A case study of secondary education in Nigeria. *Journal of Educational Technology and Development*, **29**(3), 189-203.
- Aminu, W.Y., Muhammad, T.A., Umar, R.W., Idris, I., Yusuf, A., & Basiru, A. (2024). Impact of artificial intelligence on academic performance of undergraduate students in Nigeria. 150-162.
- Araba, M.A., Alabi, F.S., & Okojie, M. (2022). Gender disparities in technological engagement: A study of Nigerian secondary school students' interaction with AI tools. *African Journal of Educational Studies*, **19**(1), 45-60.
- Chukwuere, J.E. (2024). The use of Chat GPT in higher education: The advantages and disadvantages. *International Journal of Research in Business and Social Science*, **13**(1), 277-287.
- Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, **13**(3), 319-340.
- Nwoye, U.E. & Okafor, O.S. (2026). Artificial intelligence and academic achievement of students in public universities in Anambra State. *International Journal of Innovative Education Research*, **14**(1):263-274.
- Ubabuike, J.C. & Nweke, E. (2024). The impact of artificial intelligence on students' academic performance in public secondary schools in Anambra State, Nigeria. *Journal of Association of Educational Management and Policy Practitioners (JAEMPP)*, **6**(1), 358-367.