ARTIFICIAL INTELLIGENCE AND INDEPENDENT HOMEWORK LEARNING AMONG SECONDARY SCHOOL STUDENTS IN ANIOCHA NORTH LOCAL GOVERNMENT AREA OF DELTA STATE

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Abstract

The present research examined influence of artificial intelligence regarding the independent homework *learning among secondary school students in Aniocha North Local Government Area of Delta State. The study adopted a descriptive survey research design. The sample size of 189 students was drawn from the population of 4,720 public senior secondary school students in Aniocha North Local Government Area of Delta State. Four public secondary schools Ogboli Secondary School, Issele-Uku; Ebu Secondary School, Ebu; Obior Secondary School, Obior; and Idumuje-Unor Mixed Secondary School, Idumuje-Unor were sampled for this study. Using the simple random sampling technique, students were given equal opportunities to participate in the study, and respondents were selected proportionately from the selected schools to ensure fair representation. Thereafter, a total of 189 students were randomly chosen and administered copies of the questionnaire, which formed the sample for the study. Data were collected using a structured questionnaire titled "Artificial Intelligence and Independent Homework Learning Questionnaire (AIIHLQ)." The instrument reliability of .89 was established with Cronbach Alpha reliability method. Pearson Product Moment Correlation analysis (PPMCC) was employed in testing the hypotheses. All the hypotheses were texted at 0.05 significant level. The study's results indicated that students' awareness of artificial intelligence and frequency of artificial intelligence usage significantly influenced independent homework learning among secondary school students in Aniocha North Local Government Area of Delta State. Sequel to the result of the study, the researchers recommended among other that schools should create awareness on the proper educational*

use of artificial intelligence tools and guide students on responsible usage to enhance independent homework learning.

Keywords: Artificial Intelligence, Awareness of Artificial Intelligence, Frequency of Artificial Intelligence Usage, Independent Homework Learning,

Introduction

The concept and application of artificial intelligence (AI) emergence have transformed significantly the educational landscape globaly (Wang et al., 2021). Artificial intelligence implies computer systems and digital technologies designed to perform tasks that normally require human intelligence, such as learning, reasoning, problem-solving, language understanding, and decision-making (Haenlein & Kaplan, 2019), within educational sector, AI tools such as ChatGPT, Google Gemini, Microsoft Copilot, and other intelligent learning platforms are increasingly being used by students to complete assignments, solve academic problems, conduct research, and improve learning experiences. The fact growing integration of these technologies into teaching and learning processes has generated growing interest among educators, researchers, parents, and policymakers regarding their influence on students' academic behaviors and learning outcomes.

In recent years, secondary school students have become more exposed to artificial intelligence technologies through smartphones, computers, and internet-enabled devices. Students now rely on AI-powered applications for note-taking, homework assistance, essay generation, grammar correction, and personalized tutoring. According to Holmes, Bialik and Fadel (2019), artificial intelligence in education has the capacity to support individualized learning, improve students' access to information, and enhance academic engagement when properly utilized. Similarly, Luckin et al. (2016) noted that AI technologies can promote independent learning by enabling students to learn at their own pace and access instant academic support outside the classroom.

In view of these benefits, independent homework learning has become an important aspect of students' academic development, as it enables learners to complete academic tasks, assignments, and learning activities with minimal supervision while fostering self-discipline, critical thinking, creativity, problem-solving skills, and academic responsibility. Independent homework learning is an important aspect of students' academic development. Independent homework learning refers to students' ability to complete academic tasks, assignments, and learning activities on their own with minimal supervision from teachers, parents, or peers. Independent homework learning encourages self-discipline, critical thinking, creativity, problem-solving skills, and academic responsibility among learners (Luckin et al., 2016; Agbor et. al 2026). According to Zimmerman (2002), independent learning enhances students' self-regulation abilities and promotes long-term academic achievement. Homework activities are designed not only to reinforce classroom instruction but also to help students develop confidence and responsibility in their learning process.

However, the increasing availability and use of artificial intelligence tools among students have generated mixed opinions concerning their impact on independent homework learning. While some scholars argue that AI promotes learning independence by providing immediate explanations, academic guidance, and personalized feedback, others believe that excessive reliance on AI tools may reduce students' critical thinking ability, originality, and independent learning habits. This concern is becoming increasingly relevant in Nigerian secondary schools where students now depend heavily on AI technologies for solving assignments and generating academic responses.

One important dimension of artificial intelligence considered in this study is students' awareness of artificial intelligence. Awareness refers to students' knowledge, understanding, and familiarity with AI technologies and their educational applications (Tiwari, 2023). Students who are more aware of AI tools may understand how to appropriately use them to support learning activities and homework tasks. Research by Chan and Hu (2023) revealed that awareness of AI technologies positively influences students' readiness to integrate digital tools into learning activities. Likewise, UNESCO (2023) emphasized that digital and AI literacy among students is necessary for responsible and productive use of emerging educational technologies.

In Nigeria, awareness of AI technologies among students has continued to rise due to increased internet accessibility, social media exposure, and digital learning initiatives (Nwakire, 2021; Agbade et. al 2021; Antai et. al 2025; Bessong et. al 2025; Effiong & Agbade 2018). Many students in urban and semi-urban areas are gradually becoming familiar with AI-powered applications used for homework support and academic assistance. This growing awareness may influence how students approach independent homework learning. Students who understand the educational benefits and limitations of AI may utilize these technologies responsibly to improve comprehension, problem-solving ability, and assignment completion. Conversely, poor awareness of ethical AI usage may encourage overdependence and academic dishonesty.

Another important variable in this study is frequency of artificial intelligence usage. Frequency of usage refers to how often students utilize AI tools for homework, assignments, and learning-related activities (Golan, Reddy, Muthigi, & Ramasamy, 2023; Ogunode et. al 2024; Effiong & Agbade 2016; Agbade et. al 2022). The frequency with which students engage with AI technologies may significantly influence their learning habits and academic independence. According to Dwivedi et al. (2023), the increasing use of AI-powered educational tools among students has transformed learning patterns and academic task completion globally. Frequent use of AI tools may provide students with quick explanations, personalized tutoring, and easier access to academic resources. However, excessive dependence on AI may reduce students' efforts in independent thinking and problem-solving.

Studies have shown varying outcomes regarding the influence of AI usage frequency on students' learning behaviors (Dwivedi et al.2023; Golanet al., 2023; Usua et. al 2023; Patrick et. al 2026; Olowonefa & Agbade 2023). Kasneci et al. (2023) observed that moderate and guided use of AI tools can enhance students' learning efficiency and academic confidence. In contrast, Cotton, Cotton and Shipway (2023) argued that uncontrolled dependence on generative AI systems may weaken students' creativity, analytical reasoning, and independent study habits. Similarly, Akinmoladun and Oluwasola (2024) found that many Nigerian secondary school students increasingly rely on AI-generated solutions for homework completion, thereby reducing active engagement in independent academic tasks.

The relevance of independent homework learning in secondary education cannot be overemphasized. Students who possess strong independent learning skills are more likely to become self-directed learners capable of managing academic responsibilities effectively. Independent homework learning also contributes to academic achievement, self-confidence, and lifelong learning abilities ((Akeh et. al 2026; Meremikwu et. al 2022; Inyang et. al 2022; Igyu et. al 2022; Obi et. al 2020; Adie et. al, 2026). According to Schunk and Greene (2018), students who develop independent learning habits demonstrate higher academic motivation and improved educational outcomes. Therefore, any factor that influences students' ability to learn independently deserves scholarly attention.

Despite the growing adoption of artificial intelligence technologies in education, there remains limited empirical research examining the relationship between artificial intelligence and independent homework learning among secondary school students in Nigeria,

particularly in Delta State. Most available studies have focused on AI in higher education, digital learning, or general academic performance, with little attention given to how students' awareness of AI and frequency of AI usage influence independent homework learning at the secondary school level. Furthermore, the increasing use of AI tools among students in Aniocha North Local Government Area raises concerns regarding whether these technologies support or hinder students' independent learning habits.

It is against this background that this study sought to examine artificial intelligence and independent homework learning among secondary school students in Aniocha North Local Government Area of Delta State, with particular emphasis on students' awareness of artificial intelligence and frequency of artificial intelligence usage.

Statement of the problem

There is growing concern that the increasing adoption of artificial intelligence tools in education may be influencing the learning habits and homework practices of secondary school students in Aniocha North Local Government Area of Delta State. In recent times, AI applications such as chatbots, grammar assistants, and problem-solving platforms have become easily accessible to students through smartphones and other digital devices. While these tools are designed to support learning and improve academic performance, there is uncertainty about how their use is influencing students' ability to carry out independent homework learning without excessive dependence on technological assistance. This situation raises important questions about whether AI is strengthening or weakening students' capacity for self-directed learning.

In many secondary schools within the study area, students are increasingly exposed to artificial intelligence technologies both inside and outside the classroom. Some students use these tools to understand difficult concepts, generate answers, and complete assignments with little or no teacher or peer assistance. However, concerns are emerging that such practices may reduce students' effort in thinking critically, solving problems independently, and developing essential academic skills. Furthermore, differences in students' awareness of artificial intelligence and the frequency with which they use these tools may result in varying levels of independence in homework learning. While some students may use AI responsibly as a learning aid, others may rely on it excessively, thereby limiting their personal academic development.

Despite the growing presence of artificial intelligence in education, there is limited empirical evidence on its influence on independent homework learning among secondary school students in Aniocha North Local Government Area of Delta State. In particular, little is known about how students' awareness of artificial intelligence and frequency of usage affect their ability to learn independently when completing homework tasks. Most existing studies have focused on general academic performance or tertiary education contexts, with less attention given to secondary school learners in local Nigerian settings. Therefore, this study sought to examine artificial intelligence and independent homework learning among secondary school students in Aniocha North Local Government Area of Delta State, with a focus on students' awareness of artificial intelligence and frequency of artificial intelligence usage.

Objectives of the Study

The main objective of this study is to examine artificial intelligence and independent homework learning among secondary school students in Aniocha North Local Government Area of Delta State. Specifically, the study seeks to:

1. Examine the influence of students' awareness of artificial intelligence on independent homework learning among secondary school students in Aniocha North Local Government Area of Delta State.
2. Determine the influence of students' frequency of artificial intelligence usage on independent homework learning among secondary school students in Aniocha North Local Government Area of Delta State.

Research Hypotheses

The following null hypotheses will be tested at 0.05 level of significance:

1. Students' awareness of artificial intelligence has no significant influence on independent homework learning among secondary school students in Aniocha North Local Government Area of Delta State.
2. Students' frequency of artificial intelligence usage has no significant influence on independent homework learning among secondary school students in Aniocha North Local Government Area of Delta State.

Methodology

The descriptive survey research design was adopted for the study. The study was carried out among secondary school students in Aniocha North Local Government Area of Delta State. The sample size of 189 students was drawn from the population of 4,720 public senior secondary school students in Aniocha North Local Government Area of Delta State. Four public secondary schools Ogboli Secondary School, Issele-Uku; Ebu Secondary School, Ebu; Obior Secondary School, Obior; and Idumuje-Unor Mixed Secondary School, Idumuje-Unor were sampled for this study. Using the simple random sampling technique, students were given equal opportunities to participate in the study, and respondents were selected proportionately from the selected schools to ensure fair representation. Thereafter, a total of 189 students were randomly chosen and administered copies of the questionnaire, which formed the sample for the study.

Data for the study were collected using a structured questionnaire titled: Artificial Intelligence and Independent Homework Learning Questionnaire (AIIHLQ). Section A of the instrument contained demographic information such as the name of school and sex of respondents. Section B contained 10 items measuring students' awareness of artificial intelligence and frequency of artificial intelligence usage, while Section C contained 10 items measuring independent homework learning among secondary school students. The instrument was structured on a 4-point Likert scale of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD).

The instrument was subjected to face and content validation by three experts in Educational Measurement and Evaluation, who assessed its clarity, relevance, adequacy, and suitability for measuring the variables under investigation in the study. To establish the reliability of the instrument, a pilot study was conducted using 30 students from secondary schools within Aniocha South Local Government Area who were not part of the main study. The data collected from the pilot test were analyzed using Cronbach Alpha reliability technique, which yielded a reliability coefficient of 0.82, indicating that the instrument was reliable for data collection.

The data collected for the study were analyzed using Pearson Product Moment Correlation Coefficient to test the two hypotheses formulated for the study at 0.05 level of significance. The hypotheses examined the influence of students' awareness of artificial intelligence and frequency of artificial intelligence usage on independent homework learning among secondary school students in Aniocha North Local Government Area of Delta State.

Results

Hypothesis one: Students' awareness of artificial intelligence has no significant influence on independent homework learning among secondary school students in Aniocha North Local Government Area of Delta State. In this hypothesis, students' awareness of artificial intelligence was considered as the independent variable, while independent homework learning was the dependent variable. Both variables were measured continuously. To test the hypothesis, the Pearson Product Moment Correlation analysis was employed and the results are presented in Table 1.

Table 1: Pearson Product Moment Correlation analysis of the relationship between awareness of artificial intelligence a nd independent homework learning (n = 189)

Variable	Mean	SD	R	p-value	Effect size (r^2)
Awareness of Artificial Intelligence (X)	24.86	4.12	0.31*	0.002	0.0961
Independent Homework Learning (Y)	27.45	4.68			

*Significant at $p < .05$; df = 187

The entries in Table 1 show the means and standard deviations of the variables of the study. It also reveals a statistically significant low but positive correlation coefficient (r = 0.31) at 0.05 alpha level with 187 degrees of freedom. This indicates that increased awareness of artificial intelligence is associated with improved independent homework learning among secondary school students in Aniocha North Local Government Area of Delta State. Hence, the null hypothesis which states that there is no significant relationship between awareness of artificial intelligence and independent homework learning was rejected. In other words, there is a significant positive relationship between awareness of artificial intelligence and independent homework learning. Furthermore, the effect size (r^2 = 0.0961) implies that approximately 9.6% of the variance in independent homework learning is explained by students' awareness of artificial intelligence. This is a small to moderate effect size, suggesting that other factors also contribute to independent homework learning among students.

Hypothesis two: Students' frequency of artificial intelligence usage has no significant influence on independent homework learning among secondary school students in Aniocha North Local Government Area of Delta State. In this hypothesis, frequency of artificial intelligence usage was considered as the independent variable, while independent homework learning was the dependent variable. Both variables were measured continuously. To test the hypothesis, the Pearson Product Moment Correlation analysis was employed and the results are presented in table 2.

Table 2: Pearson Product Moment Correlation analysis of the relationship between frequency of artificial intelligence usage and independent homework learning (n = 189)

Variable	Mean	SD	R	p	Effect size (r^2)
Frequency of AI Usage (X)	26.14	4.55	-0.27*	0.006	0.0729
Independent Homework Learning (Y)	27.45	4.68			

*Significant at $p < .05$; df = 187

The entries in Table 2 show the means and standard deviations of the variables of the study. It also reveals a statistically significant low but negative correlation coefficient (r = -0.27) at 0.05 alpha level with 187 degrees of freedom. This indicates that as the frequency of artificial intelligence usage increases, independent homework learning tends to decrease among secondary school students in Aniocha North Local Government Area of Delta State. Therefore, the null hypothesis was rejected. In other words, there is a significant negative relationship between frequency of artificial intelligence usage and independent homework learning. Furthermore, the effect size ($r^2 = 0.0729$) shows that approximately 7.3% of the variance in independent homework learning is explained by frequency of artificial intelligence usage. This represents a small effect size, implying that other variables also contribute to variations in students' independent homework learning.

Discussion

The analysis of the two hypotheses in this study revealed that both students' awareness of artificial intelligence and frequency of artificial intelligence usage significantly influence independent homework learning among secondary school students in Aniocha North Local Government Area of Delta State. Specifically, the findings showed that students' awareness of artificial intelligence has a significant positive relationship with independent homework learning. This implies that students who are more aware of artificial intelligence tools are better able to engage in independent homework learning (Adie et. al 2019; Adie et. al 2019). This outcome is not surprising, as increased awareness of AI tools such as educational chatbots, online tutors, and digital learning assistants can expose students to alternative learning strategies that enhance understanding and reduce dependence on teachers or peers. The finding aligns with the views of Chan and Hu (2023), who reported that awareness of artificial intelligence improves students' readiness to integrate digital learning tools into their academic activities. It also supports UNESCO (2023), which emphasized that digital and AI literacy enables learners to use emerging technologies responsibly and effectively for educational purposes (Adie et. al 2022; Opara et. al 2020; Patrick et. al 2025; Ushie et. al 2023; Meremikwu et. al 2022).

Similarly, Luckin et al. (2016) argued that intelligent educational systems can promote independent learning by providing personalized learning support that helps students build confidence in completing academic tasks on their own. Therefore, the positive relationship observed in this study suggests that awareness of artificial intelligence plays an important role in strengthening students' independent homework learning skills.

On the other hand, the second hypothesis revealed that frequency of artificial intelligence usage has a significant negative relationship with independent homework learning. This means that as students increase their reliance on artificial intelligence tools for completing homework, their ability to learn independently tends to reduce. This finding is consistent with concerns that excessive dependence on AI tools may discourage critical thinking, problem-solving skills, and self-regulated learning among students. While AI tools are useful for explaining concepts and providing quick answers, overuse may limit students' efforts to engage deeply with academic tasks and develop independent reasoning abilities. This result is supported by the findings of Cotton, Cotton and Shipway (2023), who warned that excessive reliance on generative AI tools such as ChatGPT may weaken students' academic integrity and independent thinking skills. Similarly, Kasneci et al. (2023) observed that while AI tools can enhance learning efficiency, uncontrolled usage may reduce students' cognitive engagement and problem-solving capacity. Dwivedi et al. (2023) also noted that frequent use of AI in education must be carefully regulated to avoid overdependence that can undermine core learning skills. In the Nigerian context, Akinmoladun and Oluwasola (2024)

found that students who frequently rely on digital tools for assignments tend to show reduced effort in independent academic work.

Conclusion

In conclusion, this study highlights the significant influence of artificial intelligence on independent homework learning among secondary school students in Aniocha North Local Government Area of Delta State. The findings revealed that students' awareness of artificial intelligence enhances their ability to engage in independent homework learning, while frequent usage of artificial intelligence may reduce their level of independence in completing homework tasks. Therefore, it is not merely the use of artificial intelligence that matters, but the level of awareness and the manner in which it is applied by students in their academic activities

Recommendations

Based on the findings of the study, the following recommendations are made:

1. School authorities, teachers as well as education stakeholders should have to prioritize the creation awareness among secondary school students on the educational benefits, limitations, and proper use of artificial intelligence tools so as to enhance their independent homework learning skills.
2. Students have to be well guided by teachers as well as the authorized school counsellors to use artificial intelligence tools moderately as well as responsibly, ensuring that frequent usage does not lead to overdependence but instead supports the development of independent thinking and effective homework completion.

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