Unizik Orient Journal of Education (UNIOJE), Vol. 12, No. 1, December, 2025.
----------ISSN: 0794-9525----------

Assessing Awareness and Engagement with Artificial Intelligence Tools: Enhancing Academic Performance among Secondary School Students in the Awka Educational Zone.

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Abstract:
This study investigated the awareness and engagement of secondary school students in the Awka Educational Zone with artificial intelligence (AI) tools. Prompted by increasing calls for the integration of AI into educational settings, the study specifically aimed to assess how aware and engaged students are with AI tools that can potentially improve their academic outcomes. The study was guided by three research questions and one null hypothesis was tested. Study population was 5,010 Senior Secondary Two (SS2) students from 54 government-owned schools, from which 350 were selected using a multistage sampling procedure. Data were collected through a 25-item, researchers-developed questionnaire titled "Awareness and Engagement with Artificial Intelligence Tools for Enhancing Academic Performance Questionnaire *(*AEAITEAPQ*)*" validated by three experts from the Faculty of Education, Nnamdi Azikiwe University Awka, and found to be reliable with coefficient value of 0.80 using Cronbach alpha statistics. Means and standard deviation were used to answer research questions, while inferential statistics of two-sample z- test was used to test the null hypothesis at 0.05 level of significance. Findings reveals moderate level of awareness of AI tools, with commonly used tools including AI chatbots. On the other hand, students engagement with AI tools for academic purposes shows great extent engagement. In addition, factors such as parents, teachers, instant response, friends, access to devices among others influenced their engagement with AI tools. Result of the hypothesis shows that there is no significant difference between males and females among secondary school students in Awka Educational zone($p=0.866 > a=0.05$)) therefore, the null hypothesis is not rejected. Based on the findings, it was therefore recommended among others that: educational authorities should initiate more sensitization campaigns or interactive learning program that show students how AI tools can be directly applied to schoolwork.

Keywords: Academic Performance**,** Artificial Intelligence (AI), AI tools, Awareness, Engagement

Introduction

Education of the moment is striving to bridge the gap between theoretical knowledge and practical application of knowledge by proffering concrete and personalized solutions to human complex needs and problems. The knowledge that stems from this education builds upon each other and attracts creative minds alike which bring forth greater opportunity for innovations, growth, development, technological explosion and global interconnectivity (Obineche *et al.,* 2025). Technological explosion fosters promising improvement on academic and professional endeavors alike. The rapid advancement of Artificial Intelligence (AI) that stems from 21st century technological explosion is evidently revolutionizing every facets of human engagement and knowledge acquisition in a profound inclusive dimension..

As education continues to evolve, AI driven tools are increasingly integrated into classrooms to offer personalized learning experiences, automate administrative tasks, deploy virtual learning assistants, and deliver intelligent tutoring systems that adapt to individual learner needs (Yarlagadda, 2025). These innovations have been shown to improve student comprehension, foster learner autonomy, and provide timely feedback contributing to enhanced academic performance.

AI tools have emerged as pivotal instruments for enhancing academic performance, particularly among secondary school students. This transformation is particularly crucial at the secondary school level, where academic foundations are solidified, and learners prepare for higher education and career pursuits. AI-powered platforms are capable of delivering tailored support through features such as automated grading, predictive analytics, adaptive learning, and chatbots that respond to student queries in real time. These innovations have been shown to improve student comprehension, foster learner autonomy, and provide timely feedback, all of which contribute to enhanced academic performance (Luckin *et al*., 2016). As educational institutions in Nigeria, including those in the Awka Educational Zone, begin to explore these innovations, understanding students' awareness and engagement with AI tools becomes essential.

The emergence of cutting-edge technology and the global promotion and publicization of AI in 21st-century education have significantly caused a profound paradigm shift in pedagogical approaches. This technological advancement, ushered in by the Fourth Industrial Revolution (4IR), is transforming conventional instructional models and redefining the educational landscape by introducing novel educational needs and competencies.

In the context of this study, authors sees Artificial intelligence as the science of programming digital systems, to accept input, act intelligently, function autonomously and perform multitasking operations aimed at providing rapid and effective solutions to problems across academic and professional endeavors. AI delivers a broad spectrum of specialized coding and educational services through intelligent tools such as Quizlet with AI features, Grammarly, ChatGPT, Socratic by Google, copilot, Century Tech, among other AI-driven platforms. These platforms leverage AI to enhance both teaching and learning experiences, offering tailored assistance, feedback, and adaptive learning paths. These AI tools are seen by authors as highly intelligent, digitally driven systems, powered to offer diverse range of specialized services aimed at addressing human complex needs as well as emerging educational demands. These AI driven tools offer personalized learning and 24/7 intelligent tutoring support for its users.

The integration of artificial intelligence (AI) in education has significantly modernized how students learn, particularly by enabling personalized learning. Murtaza et al. (2022) describe personalized learning as an AI-driven teaching strategy that adapts lessons to suit each student's unique needs, interests, pace, and strengths. Similarly, Hennekeuser *et al.* (2024) affirm that AI facilitates such experiences by using algorithms to assess a learner's strengths, weaknesses, and preferred learning styles. This allows for the tailoring of educational content lessons, exercises, and resources to suit individual students. Hashim *et al.* (2022) add that AI's ability to analyze this data enables it to generate customized learning programs, effectively addressing diverse learning speeds and preferences, and enhancing overall educational outcomes. A key advantage of personalized learning is its capacity to ensure that every student receives the guidance necessary to reach their full potential whether by providing extra support to struggling learners or offering advanced material to those ready for more challenge (Rad *et al.,* 2018).

In addition to adaptive content delivery, AI is also transforming instruction through Intelligent Tutoring Systems (ITS). Coy *et al. (*2024) emphasize that ITS aim to replicate the benefits of one-on-

one human tutoring by delivering individualized instruction through AI technology. This is particularly valuable for students requiring additional help outside of standard classroom hours. Harry (2023) notes that ITS rely on robust algorithms and machine learning techniques to analyze student needs and personalize instruction accordingly. Author further, concludes, that these tools continuously evaluate student progress and deliver personalized guidance, thereby improving learning outcomes and boosting student motivation.

Despite the consistent benefits of AI in 21st century education, a notable gap persists in students' awareness and engagement with AI tools, which influence academic improvement. In the context of this study, authors sees awareness as students having a well-informed knowledge and exposure about the potential relevance of AI technology in both academic and future professional careers, as well as the complexity that comes with leveraging on AI platforms. Beheshti and Kerridge (2025) buttress that awareness goes beyond recognizing AI as a concept, it involves grasping its functions, limitations, and ethical considerations. Engagement, on the other hand, was viewed as students' readiness to embrace and leverage on broad spectrum of AI powered platforms to optimize learning outcomes. Engagement might not be feasible without adequate awareness, for responsible engagement brings out improved academic performance, which is central goal of education. .

Academic performance according to Obineche *et al*. (2025), refers to formal evidence of learners' commitment to an organized body of knowledge, attitudes, and skills imparted by their tutors across various citadels of learning. In the context of this study, however, such an organized body of knowledge may appear superficial, yielding minimal academic benefits due to insufficient awareness and limited engagement with AI-driven tools. Secondary school students' academic performance in the Awka Educational Zone can be enhanced through effective engagement with artificial intelligence (AI) tools, only if awareness of such tools are sufficiently exposed to their advantage. Student engagement with AI tools has been linked to improved academic performance, increased critical thinking, higher motivation, and greater retention of knowledge among its users (Eltahir & Babiker, 2024).

Artificial intelligence awareness is a determinant factor to students' engagement to broad spectrum of AI driven platforms and its potential reflections on their academic outcomes. Integrating AI in 21st century education has a promising potential to enhance academic performance. However, the effectiveness of this AI technology can only be optimized by secondary school students' awareness of its potential benefits in their academic achievement and future opportunities, and their readiness to actively engage in the use of AI powered platforms for their wholesome growth and development in 21st century world of learning and work. Corroborating the above, the research finding of Ramos *et al.* (2025) found that graduates with higher AI literacy were more likely to secure employment in their field of study and reported increased productivity and professional alignment. In addition, Cui *et al*. (2019) in their finding revealed that students engaging in AI technology outperformed their peers in core subjects. Demonstrating that AI-based adaptive learning system provides personalized feedback and tailored learning experiences, leading to enhanced student engagement and academic performance. However, Okoye *et a*l. (2024) in their findings revealed that secondary school students are aware of Artificial Intelligence tools for learning of English Language to a moderate extent. More so, Redondo and Paglinawan (2025) in their findings reveal varying degrees of AI awareness, with engagement influenced by academic exposure, accessibility, personal interest among other factors

Contrarily, research finding of Oyawole *et al.* (2025) revealed that students demonstrated very low awareness of AI tools and were not utilizing them in their learning processes. Similarly, Enebechi *et al*. (2025) in their findings indicated that not only was overall awareness low, but there were also no significant gender differences in AI awareness or utilization. Thus, these research reports seems to be inconsistent.

Notably, gender is another variable increasingly regarded as significant in assessing awareness and engagement for technology-enhanced education within the higher education space, considering that findings have been inconclusive. Alimi *et al*. (2021) in their research study revealed no significant difference between male and female university students' awareness of the use of artificial intelligence for learning. This study concluded that students' ability to explore digital resources such as AI is dependent on their awareness and access to digital technologies. A study by Oladele *et a*l. (2021) revealed significant differences related to the male gender, while Ayanwale *et al.* (2024) found significant differences associated with the female gender which leaves room for further investigation,

in other to close the gender gap, with further study on secondary school students awareness and engagement on AI powered tools.

Despite the evident advantages, secondary school students have not yet fully harnessed the capabilities of this cutting-edge technology. This gap in adoption may stem from insufficient exposure to the wide array of AI enabled learning platforms. Therefore, this study sought to ascertain students' awareness of AI tools, examine how this awareness influences their engagement with such technologies, and ultimately explore how this engagement impacts their academic performance

Research Questions:

1. What is the level of awareness of artificial intelligence (AI) tools for improving academic performance among secondary school students in Awka Educational zone?
2. To what extent do secondary school students in the Awka Educational Zone engage with AI tools for academic purposes?
3. What factors influence secondary school students awareness and engagement with AI tools in Awka Educational zone?

Hypothesis

1.There is no significant difference in the level of awareness of artificial intelligence (AI) tools for improving academic performance between male and female secondary school students in the Awka Educational Zone.

Methodology

This study was carried out in Awka Educational zone of Anambra State. Awka Educational zone covered five local government areas namely; Awka -North, Awka- South, Anaocha, Dunukofia and Njikoka. The study employed a descriptive survey research design. Survey research according to Leedy and Ormod (2019) aims at obtaining information about one or two groups of people about their behaviours, opinions either directly or systematically using their answers. The design allows for the collection and analysis of data from a sample representing a larger population. This design was considered suitable because it made use of students' opinions about awareness and engagement with AI tools. Population of the study was 5,010 senior secondary school two (SS2) students from 54 government-owned schools, with sample size of 350 selected using a multistage sampling procedure. The first stage involved the use of simple random sampling technique (by balloting) to select five schools each from the five Local Government Areas in Awka Educational zone. The second stage involved the use of convenience sampling technique to draw 14 students from five schools in each Local Government Area to give a total of 350 students comprising 186 females(53.1%) and 164 males (46.9%)s from all the five Local Government Area. A 25 items researchers' structured questionnaire titled "Awareness and Engagement with Artificial Intelligence Tools for Enhancing Academic Performance Questionnaire (AEAITEAPQ)" was printed and circulated among students through the help of five trained research assistants, using physical form to reach the target sample. The questionnaire were divided into four sections; Section A: Demographic information; Section B: Items measuring level of awareness of AI tools; Section C: Items measuring extent of engagement with AI tools for academic purposes; Section D: Items measuring factors that influence secondary school students awareness and engagement with AI tools. The 25 items questionnaire were structured on a five–point Likert rating scale of: Awareness scale consist, 1=not aware, 2=slightly aware, 3=moderately aware, 4= very aware, 5= extremely aware; Engagement with AI tools scale consist, 1= very small extext,2= small extent, 3=moderate extent, 4= great extent, 5= very great extent; Factors influencing awareness and engagement with AI tools scale consist, 1= strongly disagree,2=disagree, 3=neutral , 4=agree, 5= strongly agree. The instrument was validated by three experts from the Faculty of Education, Nnamdi Azikiwe University Awka. Their suggestions were incorporated into the final version of the instrument. To determine reliability, a pilot study was conducted with 25 secondary schools students and Cronbach Alpha statistics was used to obtain internal consistency co-efficient of 0.80 as an overall. Descriptive statistics (means and standard deviation) were used to answer research questions while inferential statistics, two sample Z-test was used to test null hypothesis at 0.05 level of significance. With mean score check rate to be 3.00 as 3point based on 5-likert scale.

Analysis of Data

Research Question 1: What is the level of awareness of artificial intelligence (AI) tools for improving academic performance among secondary school students in Awka Educational zone?

Table 1: Mean scores of respondents on the level of awareness of artificial intelligence (AI) for improving academic performance of students.

	Items	N	Mean	S.D	Decision
1.	I am aware of what Artificial intelligence means	350	3.62	.646	Very aware
2.	I am aware of AI tools E,g, Chatgpt. Siri, Google Assistant or similar	350	3.46	.664	Moderately aware
3.	I am aware of how AI tools can be used in improving learning	350	3.48	.673	Moderately aware
4.	I am aware of how AI tools and its benefit for future endeavours	350	3.42	.668	Moderately aware
5.	I am aware that AI tools can help me solve my personal academic problems	350	3.57	.623	Very aware
	Grand Mean	**350**	**3.50**	**0.65**	Very aware

The results presented in Table 1 reveal that secondary school students in the Awka Educational Zone demonstrate a generally high level of awareness of artificial intelligence (AI) tools for improving academic performance. This is supported by the grand mean score of 3.50, which falls within the "Very aware" category.

Specifically, students indicated that they are very aware of what artificial intelligence means (M = 3.62) and are also very aware that AI tools can help solve personal academic problems (M = 3.57). However, their awareness is only moderate in some specific areas. For instance, students showed moderate awareness of AI tools such as ChatGPT, Siri, and Google Assistant (M = 3.46), as well as moderate understanding of how AI tools can be used to improve learning (M = 3.48). Similarly, awareness of the benefits of AI tools for future academic and career endeavors (M = 3.42) was also at a moderate level.

Overall, while students possess a strong general awareness of AI and its relevance to academic problem-solving, their knowledge of specific tools and practical applications remains moderate. This suggests that although awareness is relatively high, there is still a need for increased exposure and deeper understanding of how AI tools can be effectively utilized in learning and future pursuits.

Research Question 2: To what extent do secondary school students in Awka Educational zone engage with AI tools for academic purposes?

Table 2: Mean scores of respondents on the extent secondary school students engage with AI tools for academic purposes

	Items	N	Mean	S.D	Decision
6.	I use AI tools to complete assignments	350	3.80	.933	Great extent
7.	I use AI tools to generate ideas for essays or class presentations	350	3.80	.921	Great extent
8.	I use AI tools to prepare for examinations	350	3.95	.824	Great extent
9.	I use AI tools to practice or revise topics I find difficult	350	3.86	.737	Great extent
10.	I rely on AI tools when I do not understand what my teacher taught in class	350	3.91	.789	Great extent
11.	AI tools help me learn new concept more efficiently	350	3.47	.785	Moderate extent

12.	I regularly incorporate suggestions from AI tools into my academic work	350	3.75	.918	Great extent
13.	Ai tools applications trigger my human reasoning	350	3.66	.813	Great extent
14.	Using AI tools has improved my academic performance	350	4.00	.779	Great extent
15.	I use Ai tools responsibly, maintaining ethnical rules	350	3.90	.963	Great extent
	Cluster Mean	350	3.81	0.85	Great extent

The analysis in Table 2 shows that secondary school students in the Awka Educational Zone engage with AI tools for academic purposes to a great extent, as indicated by the cluster mean of 3.81 and cluster standard deviation of 0.85, which falls within the decision benchmark of 3.50–4.49 (Great Extent).

The results reveal that students use AI tools to complete assignments, generate ideas for essays or presentations, prepare for examinations, revise difficult topics, and seek clarification on lessons they do not understand, all to a great extent. Students also reported incorporating suggestions from AI tools into their academic work and perceiving that the use of AI tools has improved their academic performance. In addition, they indicated that they use AI tools responsibly while maintaining ethical rules.

However, the finding further shows that AI tools help students learn new concepts more efficiently only to a moderate extent. Overall, the results suggest that students widely engage with AI tools as supportive resources for various academic activities.

Research Question 3: What factors influence secondary school students' awareness and engagement with AI tools in Awka Educational zone?

Table 3: Mean scores of respondents on the factors that influence students' awareness and engagement with AI tools.

	Items	N	Mean	S.D	Decision
16	I am encouraged by my parents to use AI tools	350	3.97	0.81	Agree
17	Instant response to information from AI tools such as chatgpt, Siri, Google Assistant or similar influences my constant use of it	350	4.12	0.68	Agree
18	I have received encouraging information about AI tools from teachers	350	4.00	0.81	Agree
19	Internet has increased my awareness of AI tools	350	3.88	0.89	Agree
20	My schools provides opportunities that increased my awareness to AI tools	350	3.96	0.78	Agree
21	I have reliable internet access to explore and use AI tools	350	4.00	0.71	Agree
22	My friends use AI tools which motivates me to use them too	350	4.00	0.79	Agree
23	The ability to use AI tools to meet up with school assignment influence my use of it	350	4.04	0.81	Agree
24	The ability to use AI tools to understand difficult complex concept influences my use of it	350	4.16	0.78	Agree
25.	I have access to devices, that allow me to use AI tools for learning	350	4.15	0.69	Agree
	Cluster Mean	350	4.03	0.78	Agree

The results in Table 3 show that several factors influence secondary school students' awareness and engagement with AI tools in the Awka Educational Zone. The cluster mean of 4.03 (SD = 0.78) indicates that respondents agreed that these factors significantly influence their awareness and use of AI tools.

Specifically, students agreed that instant responses from AI tools, access to internet and digital devices, peer influence, parental encouragement, and teachers' information about AI tools contribute to their awareness and engagement. Students also indicated that the ability of AI tools to assist with

school assignments and simplify difficult concepts motivates their use. Overall, the findings suggest that technological access, social influence, and academic usefulness are key factors shaping students' awareness and engagement with AI tools.

Hypothesis 1:There is no significant difference in the level of awareness of artificial intelligence (AI) tools for improving academic performance between male and female secondary school students in the Awka Educational Zone.

Table 5:Independent Samples Test

		Levene's Test for Equality of Variances		z-test for Equality of Means						
		F	P-value	z	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Awareness	Equal variances assumed	.007	.931	.168	197	.866	.068	.403	-.726	.862
	Equal variances not assumed			.163	113.751	.871	.068	.417	-.758	.893

The z-test result shows a p-value of 0.866, since the p-value exceeds 0.05, the null hypothesis is not rejected. The analysis supports the null hypothesis, which means there is no statistically significant difference in the level of awareness of AI tools between male and female secondary school students in the Awka Educational Zone. Additionally, the confidence interval for the mean difference includes zero (−0.726 to 0.862), further supporting the conclusion that any observed difference is not statistically meaningful.

Discussion of Findings:

The finding of the study on level of awareness of artificial intelligence (AI) tools for improving academic performance among secondary school students in Awka Educational zone revealed moderate awareness to the knowledge and exposure of AI powered tools. This is in consonance with research finding of Okoye *et al*. (2024) in their findings revealed that secondary school students are aware of Artificial Intelligence tools for learning of English Language to a moderate extent. Contrarily, research finding of Oyawole *et al*. (2025) and Enebechi *et al*. (2025) revealed that students demonstrated very low awareness of AI tools in their respective studies conducted. This differences in results, though different area of study might be influence by diverse factors.

Furthermore, finding of the study on research question two on extent secondary school students in Awka Educational zone engage with AI tools for academic purposes revealed great extent, which may be influence by their competence with AI devices. This finding resonate with Luckin *et al*.(2016) which revealed that innovations in technology such as AI have been shown to improve student comprehension, foster learner autonomy, and provide timely feedback, all of which contribute to enhanced academic performance.

Moreso, finding of the study on research question three on factors that influenced secondary school students awareness and engagement with AI tools in Awka Educational zone revealed agreed which indicates that some factors significantly influenced their awareness and use of AI tools. This finding is in agreement with Redondo and Paglinawan (2025) in their finding revealed varying degrees of AI awareness, with engagement influenced by academic exposure, accessibility, personal interest among other factors.

Finding on the level of awareness of artificial intelligence (AI) tools for improving academic performance between male and female secondary school students in the Awka Educational Zone revealed no statistically significant difference in the level of awareness of AI tools between male and female secondary school students in the Awka Educational Zone. This is in agreement of finding of Alimi *et al*. (2021) in their research study revealed no significant difference between male and female university students' awareness of the use of artificial intelligence for learning. In disagreement was the finding of Oladele *et al.* (2021) which revealed significant differences related to the male gender.

Conclusion:
Based on the study's findings, it was concluded that artificial intelligence awareness and students' engagement with artificial intelligence will cushion their academic struggle and enhance academic performance.

Recommendations:
The following recommendations were made;
1.Educational authorities should initiate sensitization campaigns or interactive learning program that show students how AI tools can be directly applied to schoolwork, in other to increase awareness and engagement of diverse AI tools, emphasizing their academic benefits and responsible use.
2. Government and stakeholders should invest in improving ICT infrastructure in schools to remove technological barriers hindering students' effective use of AI for learning in 21st century education.
3. Since no significant gender difference was found in AI awareness, policies should aim to maintain this equity by ensuring that both male and female students have equal access to AI learning tools and resources.

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