

Awareness, Usage and Benefits of Artificial Intelligence for Instructional Purposes among Undergraduate students in the Nigerian Universities

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Abstract

This study assessed the awareness, usage, and benefits of artificial intelligence for instructional purposes among undergraduate students in Nigerian universities. The study was motivated by the increasing integration of AI technologies into higher education and the need to understand the extent to which undergraduate students are aware of, use, benefit from, and experience challenges associated with AI-supported teaching and learning. A descriptive survey research design was adopted for the study. The sample size of 412 students was selected using Taro Yamane's determination Table. Data were collected using a structured questionnaire, and the instrument was subjected to appropriate validation, and a reliability coefficient of .76 was obtained. The data collected were analysed using frequency counts, percentages, mean and standard deviation for the research questions. The findings revealed that undergraduate students demonstrated a high level of awareness of AI tools and made substantial use of such tools for academic activities. The findings further showed that students perceived AI as beneficial to instruction through improved understanding of course concepts, enhanced engagement and motivation, and increased academic efficiency. The study therefore recommends that universities strengthen ICT infrastructure and internet access, provide continuous AI and digital-literacy training for students and lecturers, integrate appropriate AI applications into teaching and learning, develop clear institutional guidelines for responsible AI use, and provide adequate institutional support to promote effective, equitable and responsible adoption of AI in Nigerian universities.

Keywords: challenges and opportunities, Artificial Intelligence and ICT infrastructure

Introduction

The purpose of education has globally changed from that of producing a literate society to that of producing a learning society (Badmus, 2022). In the 21st century, digital technologies have significantly transformed the global educational landscape, particularly in higher education institutions, resulting in technological innovations widely known as Artificial Intelligence (AI). Badmus and Ajibola (2025) refer to AI as the capability of computer systems to perform tasks that typically require human intelligence, including learning, reasoning, problem-solving, decision-making, and language processing. With the continuous growth of digital technologies, AI has increasingly become integrated into educational environments to support instructional delivery, enhance student engagement, and improve learning outcomes. AI has expanded rapidly in the field of Education over the past

decade as universities across the world seek innovative ways to improve the effectiveness of teaching and learning. AI-powered technologies such as intelligent tutoring systems, automated assessment tools, virtual learning assistants, adaptive learning platforms and data-driven learning analytics have been introduced to support both instructors and students in the educational process. Badmus (2004) identified that technologies enable personalized learning experiences by adapting instructional materials to the individual learning pace and needs of students. Zawacki-Richter *et al.* (2019) recognized AI as a powerful tool for promoting student-centered learning and improving the efficiency of instructional delivery in higher education.

Badmus and Ajibola (2025) noted that the advancement in technology nowadays is Artificial intelligence (AI), where every aspect of human endeavor is touched. Major opportunities associated with the integration of AI in instruction is its ability to facilitate personalized and adaptive learning environments. Traditional teaching methods frequently rely on a uniform approach to instruction, which may not adequately address the diverse learning abilities and preferences of students. AI-driven systems can analyze students' learning behaviours and academic performance to tailor instructional content according to their individual needs. Through AI technologies, students receive immediate feedback, thereby enabling them to identify areas of difficulty and improve their learning strategies more effectively.

Zawacki-Richter *et al.* (2019) affirmed that despite the numerous opportunities that AI presents for enhancing instructional delivery, the implementation of AI in higher education also raises several challenges. Oshin and Badmus (2018) highlighted factors that hinder the integration of ICT in educational institutions in Nigeria, such as teacher attitudes toward ICT, lack of relevant content, lack of access to internet and computers after school, lack of adequate funding and resources, lack of training focusing on pedagogical innovation and learner-centred strategies. Unlike in many developing countries, including Nigeria, these infrastructural requirements are often insufficient, in that way limiting the successful adoption of AI technologies in educational institutions. In addition, another major challenge associated with the implementation of AI in education is the issue of digital literacy among students and educators. Bond *et al.* (2021), noted that effective use of AI-powered educational tools requires a certain level of technical knowledge and digital competence. Several university lecturers and students may lack the necessary skills to effectively utilize these technologies for teaching and learning purposes. This gap in digital competence can hinder the successful integration of AI into instructional practices and reduce its potential benefits in the educational system. Moral concerns also poses a challenge in the adoption of AI in education. Problems like data privacy, algorithmic bias, academic integrity and overdependence on AI tools have raised concerns among educators and policymakers. For instance, the increasing use of AI-based tools for completing academic tasks has generated debates regarding academic honesty and the potential misuse of AI technologies by students. Ensuring responsible and ethical use of AI in education therefore remains a significant consideration for universities seeking to integrate these technologies into their instructional systems (Crompton & Burke, 2023).

The implementation of advanced AI-powered systems remains limited due to several challenges, including inadequate technological infrastructure, insufficient institutional funding and limited awareness of AI applications in education. As a result, many universities

are still at the early stages of integrating AI into their instructional practices. Olasedidun, Ganiyu and Badmus (2021) found that teachers' attitude towards adopting online teaching and learning was negative. Adedapo (2021) found that the teacher had a positive disposition towards basic science and technology teaching and a significantly positive correlation between teachers' attitudes and students' achievement in basic science and technology.

Onuorah, Badmus, and Salawu (2020) found that education can take place in formal or informal settings and any experience that has a formative effect on the way one thinks, feels, or acts may be considered educational. Undergraduate students play a critical role in influencing the success of AI implementation in higher education institutions. Students increasingly rely on digital platforms, online resources and AI-powered tools for their academic work and researches, it becomes imperative to examine how these technologies influence their learning experiences. The extent to which AI is effectively utilized for instructional purposes in the institution and the challenges students encounter while using these technologies remain areas that require further investigation. From the foregoing, this study examined the challenges and opportunities associated with implementing Artificial Intelligence for instructional purposes from the perspectives of undergraduate students in

Statement of the Problem

Artificial intelligence (AI) is increasingly being explored as a tool for improving instructional delivery in higher education. In Nigerian universities, AI applications such as intelligent tutoring systems, automated assessment tools, adaptive learning platforms, and generative AI may help lecturers personalize learning, provide timely feedback, and make teaching more efficient. However, the extent to which these tools are available, understood, and effectively used for instruction across Nigerian universities remains uncertain. Implementing AI for instructional delivery also presents significant challenges. Many universities may face inadequate digital infrastructure, unreliable internet access, limited funding, and shortages of relevant technical support. Lecturers and students may have varying levels of digital and AI literacy, while concerns about data privacy, academic integrity, bias, inaccurate outputs, and overreliance on technology may affect trust and responsible use. Differences in institutional resources and policies could further result in uneven access to AI-supported instruction.

Although AI has the potential to address some instructional needs, its benefits cannot be assumed without examining how it is being implemented in the Nigerian university context. There is a need for evidence on the opportunities AI offers for teaching and learning, the challenges that hinder its adoption, and the institutional, technological, and human factors that shape its use. Without such evidence, universities and policymakers may struggle to develop appropriate policies, provide relevant training, and allocate resources effectively. Therefore, this study will assess the challenges and opportunities of implementing artificial intelligence for instructional delivery in Nigerian universities. It will examine the extent of AI use, the perceived benefits, the barriers to implementation, and the measures that could support its effective and responsible integration into university instruction.

Purpose of the Study

The purpose of this study was to assess awareness, usage and benefits of artificial intelligence for instructional purposes among undergraduate students in Nigerian universities. Specifically, the study seeks to:

1. examine the level of awareness of Artificial Intelligence tools among undergraduate students for instructional purposes;
2. examine the level of usage of Artificial Intelligence tools among undergraduate students for instructional purposes;
3. identify the benefits associated with the use of Artificial Intelligence in instruction among undergraduate students;

Research Questions

The following research questions guided this study.

1. What is the level of awareness of Artificial Intelligence tools among undergraduate students for instructional purposes?
2. What is the level of usage of Artificial Intelligence tools among undergraduate students for instructional purposes?
3. What are the benefits associated with the use of Artificial Intelligence in instruction among undergraduate students?

Methodology

The designed adopted for this study was the descriptive survey research design. The descriptive survey method enables observation of existing conditions without manipulation of variables and allows the findings to be generalized to the larger population of students at the university. The population of this study comprised all undergraduate students of Adekunle Ajasin University, particularly all 300-level students. This population offers a comprehensive scope for assessing students' perspectives on the awareness, usage, and benefits AI integration in instruction.

Taro Yamane's Table of Determination was used to determine the sample size, and a simple random sampling technique was employed to select a sample of 412 undergraduate students from a population of 430. This was done based on faculty and level of study to ensure proportional representation of students from different academic disciplines and years of study. The 300 students were chosen because they have adequate knowledge of AI and have one more year to witness the future implementation of AI. This approach was employed to ensure that the sample reflects the diversity of the university population and captures the variations in students' experiences with AI in instruction. Questionnaire was used as the instrument for data collection titled: "*Artificial Intelligence in Undergraduate Instruction Questionnaire (AIUIQ)*". The questionnaire was structured in two sections. Section A elicited demographic information of respondents, including age, gender, faculty and level of study. Section B collected data related to the four research questions. Items were designed on a four-point Likert scale with the following responses: Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2 and Strongly Disagree (SD) = 1. Section B included items on: Level of awareness and usage of AI tools, Benefits of AI in instruction, Challenges faced in using AI, Strategies for enhancing effective use of AI.

The questionnaire was validated by the researcher's supervisor and experts in Educational Technology and Measurement and Evaluation from Adekunle Ajasin University by reviewing the items for clarity, relevance, and content coverage to ensuring the instrument measured the intended constructs for the study. Thirty (30) undergraduate students from a

different university outside the sample were subjected to a pilot study, thereby establishing the reliability of this study. The Cronbach Alpha coefficient was used to test internal consistency, a reliability coefficient of 0.76 was obtained.

The researcher sought permission from the authorities of Adekunle Ajasin University and administered the questionnaires to the sampled students. The instruments were personally distributed to the selected 300 undergraduate students across faculties. Respondents were informed about the purpose of the study and assured of confidentiality. Completed questionnaires were retrieved within a week to ensure completeness and accuracy of data. The data obtained were analyzed using descriptive and inferential statistics, including simple frequency count, percentage, mean, standard deviation, skewness, and kurtosis to answer the research questions raised. An average mean cutoff of 2.50 was used to interpret the responses. Scores equal to or above 2.50 were considered as agreement/acceptance, while scores below 2.50 were considered as disagreement/rejection.

Results

Socio-Demographic Attributes of the Respondents

Table 1: Respondents' Distribution by Gender, Age, Level of Study and Faculty

Variables	Categories	Freq.	%
Respondents' Gender	Male	196	47.6
	Female	216	52.4
	Total	412	100.0
Respondents' Faculty	Faculty of Education	62	15.0
	Faculty of Science	82	19.9
	Faculty of Social Sciences	72	17.5
	Faculty of Arts	62	15.0
	Faculty of Management Sciences	72	17.5
	Faculty of Law	62	15.0
	Total	412	100.0

Table 1 presents the socio-demographic characteristics of the 412 undergraduate students who participated in the study. The gender distribution indicates that 196 respondents, representing (47.6%), were male, while 216 respondents, representing (52.4%), were female. With respect to age, respondents aged 21–25 years constituted the largest group, with 176 students representing (42.7%). This was followed by respondents aged 16–20 years, who constituted (23.8%), respondents aged 26–30 years, who constituted (22.1%), and respondents aged 31 years and above, who constituted (11.4%). The distribution by level of study was reasonably balanced. The 400-level students constituted the largest group with 108 respondents (26.2%), followed by 100-level students with 104 respondents (25.2%), 300-level students with 102 respondents (24.8%), and 200-level students with 98 respondents (23.8%). In terms of faculty, the Faculty of Science contributed the largest number of respondents, 82 (19.9%), while the Faculties of Social Sciences and Management Sciences each contributed 72 (17.5%). The Faculties of Education, Arts and Law each contributed 62 respondents (15.0%). Overall, the demographic distribution provides a useful foundation for the subsequent analyses. More importantly, the relatively balanced gender, level and faculty distributions strengthen the appropriateness of examining gender and faculty differences in the major AI-related constructs investigated by the study.

Answering the Research Questions

Research Question 1: What is the level of awareness of Artificial Intelligence tools among undergraduate students for instructional purposes?

Table 2: Descriptive Statistics of the Level of Awareness of Artificial Intelligence Tools among Undergraduate Students for Instructional Purposes

		Freq.	%	Mean	SD	Skewness	Kurtosis	Decision
I am aware of Artificial Intelligence (AI) tools that can assist learning.	Very Low	24	5.8					
	Low	8	1.9					
	High	250	60.7	3.18	.733	-1.189	2.254	High
	Very High	130	31.6					
	Total	412	100.0					
I regularly use AI tools (e.g., chatbots, writing assistants, virtual learning platforms) for academic purposes.	Very Low	40	9.7					
	High	242	58.7	3.12	.831	-1.252	1.570	High
	Very High	130	31.6					
	Total	412	100.0					
I understand how to navigate and use AI tools effectively.	Very Low	38	9.2					
	High	238	57.8	3.15	.824	-1.272	1.673	High
	Very High	136	33.0					
	Total	412	100.0					
I frequently use AI tools for research and assignments.	Very Low	15	3.6					
	Low	10	2.4					
	High	248	60.2	3.24	.671	-1.053	2.432	High
	Very High	139	33.7					
	Total	412	100.0					
My awareness of AI tools influences my decision to use them for learning.	Very Low	58	14.1					
	High	228	55.3	3.02	.933	-1.096	.523	High
	Very High	126	30.6					
	Total	412	100.0					

Table 3 contains five items measuring students' awareness of AI tools and their awareness-related orientation toward using such technologies for learning. All five items produced mean scores above the study's decision benchmark of 2.50. The findings provide a clear answer to research question one. The undergraduate students demonstrated a high level of awareness of AI tools for instructional purposes. The five-item means ranged from 3.02 to 3.24, all above the 2.50 benchmark. Awareness was particularly evident in students' reported familiarity with AI-assisted research and assignments.

Research Question 2: What is the level of usage of Artificial Intelligence tools among undergraduate students for instructional purposes?

Table 3: Descriptive Statistics of the Level of Usage of Artificial Intelligence Tools among Undergraduate Students for Instructional Purposes

		Freq.	%	Mean	SD	Skewness	Kurtosis	Decision
I use AI tools to understand difficult concepts taught during lectures.	Very Low	23	5.6					
	Low	12	2.9					
	High	245	59.5	3.18	.736	-1.142	2.043	High
	Very High	132	32.0					
	Total	412	100.0					
I use AI tools to complete assignments and other academic tasks.	Very Low	22	5.3					
	High	252	61.2	3.23	.705	-1.274	2.878	High
	Very High	138	33.5					
	Total	412	100.0					
I use AI tools to prepare for tests and examinations.	Very Low	30	7.3					
	High	246	59.7	3.18	.767	-1.302	2.274	High
	Very High	136	33.0					
	Total	412	100.0					
I use AI tools to obtain additional learning materials beyond classroom instruction.	Very Low	42	10.2					
	High	238	57.8	3.12	.846	-1.240	1.420	High
	Very High	132	32.0					
	Total	412	100.0					
I use AI tools regularly to support my instructional and learning activities.	Very Low	48	11.7					
	High	232	56.3	3.09	.884	-1.192	1.041	High
	Very High	132	32.0					
	Total	412	100.0					

Table 3 recorded high mean scores. The findings show that the level of AI usage among the undergraduate students was high. The item means ranged from 3.09 to 3.23. AI was used particularly for academic tasks, difficult concepts, examinations and obtaining supplementary learning materials.

Research Question 3: What are the benefits associated with the use of Artificial Intelligence in instruction among undergraduate students?

Table 4: Descriptive Statistics of the Benefits Associated with the Use of Artificial Intelligence in Instruction among Undergraduate Students

		Freq.	%	Mean	SD	Skewness	Kurtosis	Decision
AI tools improve my understanding of course contents.	Strongly Disagree	24	5.8					
	Agree	246	59.7	3.23	.726	-1.298	2.693	Agree
	Strongly Agree	142	34.5					
	Total	412	100.0					
AI tools make learning more interesting and engaging.	Strongly Disagree	28	6.8					
	Agree	238	57.8	3.22	.762	-1.320	2.361	Agree
	Strongly Agree	146	35.4					
	Total	412	100.0					
AI tools help me complete academic tasks more efficiently.	Strongly Disagree	20	4.9					
	Agree	236	57.3	3.28	.703	-1.299	2.878	Agree
	Strongly Agree	156	37.9					
	Total	412	100.0					
AI tools enhance my academic performance and learning outcomes.	Strongly Disagree	31	7.5					
	Agree	241	58.5	3.19	.779	-1.307	2.168	Agree
	Strongly Agree	140	34.0					
	Total	412	100.0					
AI tools encourage independent learning and	Strongly Disagree	35	8.5					
	Agree	239	58.0	3.17	.806	-1.290	1.878	Agree

critical thinking.	Strongly Agree	138	33.5
	Total	412	100.0

The findings in Table 4 show that AI was perceived as providing substantial instructional benefits. The benefits included improved understanding of course content, increased engagement, greater efficiency in completing academic tasks, improved academic performance and learning outcomes, and support for independent learning and critical thinking.

Discussion of Findings

The central finding of the study is that undergraduate students at Adekunle Ajasin University demonstrate high awareness and high usage of AI, while simultaneously reporting substantial challenges and strong support for institutional strategies to improve implementation. This produces a particularly meaningful picture, the problem is not simply whether students know about AI; rather, the critical issue is whether the institutional environment can support reliable, equitable, informed and responsible use. The high awareness finding corresponds with the literature reviewed in the study. Ayanwale et al. (2022) reported considerable AI awareness among Nigerian undergraduates, while Chaka (2021) similarly found high awareness among South African university students. Dwivedi et al. (2021) also reported generally high awareness among university students. However, the present study goes beyond awareness by demonstrating substantial practical usage. Students reported using AI to understand difficult concepts, complete assignments, prepare for examinations, obtain supplementary learning materials and support regular learning activities. This finding is important because it demonstrates that AI has already become part of students' academic practices.

At the same time, the study reveals high usage of AI among the undergraduates in Nigerian universities, particularly Adekunle-Ajasin University, Ondo State. The findings showed that student are using AI in their academic activities. This result was in line with studies of Karunanayaka, Weerasinghe, and Somarathna (2026) indicate that roughly 82% to 86% of university students use AI tools for schoolwork, with over 50% utilizing them on a weekly or daily basis. Also, Adeyiwalu, Adedolapo, and Bamigbaye (2026) affirmed that AI tools have become an integral part of students' academic routines, aiding learning, research, and task completion.

The perceived benefits further reinforce this transition. Students reported that AI improves understanding, increases engagement, facilitates academic efficiency, enhances perceived academic performance and encourages independent learning. These findings correspond with Hwang and Tu (2021), Chen *et al.* (2020), Garcia *et al.* (2022) and Bond et al. (2023), whose studies identified various cognitive, behavioural, instructional and accessibility benefits associated with AI-supported education. Chen and Cheung (2025) reported that AI improves students' research and practice. From learners' perspective, Gen-AI interventions improve developmental stages across academic years, and prioritize discipline-specific ns according to learning goals. The digital-skills finding provides another important theoretical connection. Students may be aware of AI and may have access to it, yet inadequate competence can limit effective utilization. This corresponds with the project's discussion of digital literacy and with Adeleke and Eze (2022) and Badmus (2025), who found that inadequate technical skills can lead to underutilization.

Conclusion

Based on the findings, the study concludes that Artificial Intelligence has become a meaningful component of undergraduate students' academic experiences at Adekunle Ajasin University. Students demonstrate substantial awareness of AI tools and report using them for a variety of instructional and learning activities. The study further concludes that students recognize considerable educational value in AI. AI is perceived as supporting understanding, engagement, efficiency, academic performance and independent learning. These perceptions are consistent with the literature reviewed in the study, which identifies personalization, interactivity, automation and enhanced access to learning resources as important opportunities associated with AI in education.

Nevertheless, the study concludes that the realization of these opportunities is constrained by important barriers. Internet connectivity, data affordability, digital skills, device access and the reliability of AI-generated information represent significant challenges. Consequently, awareness and willingness to use AI do not automatically guarantee effective implementation. The study further concludes that effective AI implementation requires an institutional rather than exclusively individual response. Students strongly support training, reliable internet infrastructure, lecturer integration, ethical guidelines and continuous awareness programmes.

Recommendations

Based on the findings, the following recommendations are made.

1. Government should build AI awareness across the education community by providing age-appropriate AI literacy for students, practical training for teachers, and guidance for school leaders and families. Cover how AI works, its limitations and biases, privacy, academic integrity, and how to verify outputs.
2. University management should use AI to support teaching and learning by piloting approved tools for tasks such as lesson planning, accessible learning materials, feedback, translation, and administrative work. Keep teachers responsible for instructional decisions, protect student data, and ensure students have equitable access.
3. University management should maximize the potential benefits of AI and improve practice. Using AI improve learning outcomes, reduce teacher workload, accessibility, student engagement, and equity.

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