Undergraduates' Perceptions of Artificial Intelligence's Influence on Cognitive, Affective and Psychomotor Learning Outcomes in Nigerian Universities

[1]Femi Adeoye Alabi PhD
Department of Science Education, Lead City University Ibadan, Oyo State, Nigeria.
falabious@yahoo.com
+2348035085305

[2]Omoyajowo Bamidele Stephen PhD
Department of Science Education, Lead City University Ibadan, Oyo State Nigeria.
Email: Omoyajowo.bamidele@lcu.edu.ng
ORCID: https://orcid.org/0009-0009-7824-2580
Phone: 09039287758, 07034563375

[3.]Caroline Oluwatoyin Aiyegboka
Ministry of defence Command Day Secondary School, Letmauck Cantonment, Mokola Ibadan.
Phone number: +2347031951466
aiyegbokacaro@gmail.com

Abstract
Artificial Intelligence (AI) has transformed various teaching and learning activities in higher education in most parts of the world and its effects on the learning outcome of students in cognitive, affective, and psychomotor senses. This paper examined how undergraduates view Artificial Intelligence and how this factor affects learning performance in higher education institutions in Nigeria. In particular, the researchers have studied AI-related awareness levels among students, their attitudes to AI, and readiness to use AI, and have established the extent to which the perceptual variables undergo a predictive role in learning outcomes. A survey research design was used, which was descriptive. The sample involved undergraduates of the both public and the private universities of Ibadan Metropolis, Oyo State, Nigeria. A sample of 398 undergraduates were chosen using a multi-stage sampling technique. A structured questionnaire was used in the collection of data; the measure assessed the perception of AI and learning outcomes. The research is anchored on the Social Cognitive Theory by Bandura (1986), according to which the process of learning occurs as the result of a fruitful interaction of the personal, environmental and behavioural factors, because the perception and willingness of students towards AI, their interaction with AI tools, and their learning environment continuously affect each other The data analysis was done by applying descriptive statistics (mean and standard deviation) and multiple regression analysis at a 0.05 level of significance. The results have shown that undergraduates have a high level of awareness, positive attitudes and willingness to use AI to learn. The results of the multiple

regressions demonstrated that the awareness, attitude, and willingness were strong predictors of learning outcomes, and the attitude was the strongest predictor. The null hypothesis was not accepted, which means that perception of AI also has a strong impact on cognitive, affective, and psychomotor learning processes. The research finds that the positive perceptions of students are of vital importance to ensure the educational value of AI can be maximized in Nigerian universities. It suggests more awareness programmes on AI, organized training and positive institutional policies to implement positive AI integration in institutions of higher learning.

Keywords: Artificial Intelligence, Perception, Awareness, Attitude, Willingness, Learning Outcomes, Nigerian Universities.

Background of the Study

Due to the quick development of the technologies of Artificial Intelligence (AI), educational practices across the world have been changed dramatically, redefining the way knowledge is provided, received, and evaluated in colleges and universities (Bond, 2024; Wang, 2025). The use of AI-based applications, including intelligent tutoring systems, adaptive learning platforms, automated assessment and feedback tools, learning analytics, and conversational agents, is gaining growing popularity in the university teaching and learning processes to improve personalization, engagement, and academic performance (Baig and Yadegaridehkordi, 2024; Letourneau et al., 2025). Specifically, these technologies are appreciated due to the ability to facilitate higher-order thinking, learner agency, and personalized learning cycles (Brown and Smith, 2023; Johnson and Moore, 2023). Learning outcomes in higher education are traditionally theorised in three related areas, which include cognitive, affective, and psychomotor learning outcomes (taxonomy by Bloom). Knowledge acquisition, comprehension, critical thinking, and problem-solving skills are cognitive outcomes; attitudes, motivation, interest, and values of learners are the affective outcomes; practical, manipulative, and technical skills are the psychomotor outcomes (Oliver and Quinn, 2023; Ojo and Ogunshola, 2024). New evidence indicates that AI-enabled learning will be capable of impacting all three aspects because it will allow providing interactive content, adapting feedback, positive interaction by learners, and developing skills through simulations and virtual laboratorys (Liang et al., 2025; Muller and Richter, 2023).

Nevertheless, technological sophistication or investment in AI does not depend on technological factors alone to determine the pedagogical effectiveness of AI in higher education. Instead, it is highly influenced by the perceptions of AI technologies held by learners (Tripathy, 2024). The perceptions of students, which are reflected in their awareness, attitude towards AI, and readiness to use it, are a key mediating factor of AI use and translated into meaningful learning outcomes (Bello and Mensah, 2023; Williams and Xu, 2023). Awareness has an impact on how students comprehend AI functionality and its applicability in academic life; attitude indicates how they make evaluative judgments, trust, and emotional reactions toward AI; and willingness describes how they are prepared and willing to adopt AI tools in academic pursuits (Carter and Zhou, 2023;

Davis and Patel, 2023). These perceptual dimensions are in line with the existing models of technology adoption like the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) which point out that the beliefs, attitudes and behavior intentions of users are important predictors of technology usage and technology outcomes (Alzahrani, 2023; Xue, 2024). Empirical research utilizing TAM and UTAUT in the academic setting has shown that positive attitudes towards AI correlate with an elevated level of engagement, continued use, and better educational results (Cabero-Almenara et al., 2024; Feng, 2025).

In the environment of the Nigerian university, the process of introducing AI in the sphere of teaching and learning is slowly being driven by the availability of more digital technology, online courses, and mobile learning devices (Akintoye and Balogun, 2024; Chisom and Odu, 2024). The growing importance of digital technologies in the education, social development, literacy, and inclusive learning ecosystems has been emphasized by Nigerian scholars (Ajiye et al., 2024; Omokhabi, 2021; Ukpabi and Ajiye, 2025). However, the higher education sector in Nigeria still experiences some longstanding issues, such as the unequal technological access, institutional policy gaps on the use of AI, ineffective training, and differences in the digital literacy and psychological preparedness of students (Nelson and Price, 2023; Onyekachi and Adetunji, 2024). Whereas certain Nigerian undergraduates embrace the application of AI tools in assignments, research, writing academic papers, and self-directed learning (Ajiye and Omokhabi, 2025; Ojokheta et al., 2025), some are rather suspicious or disbelievy of the relevance of AI-generated content to their studies, its ethics, and its reliability (Ojokheta and Omokhabi, 2023; Thompson and Uche, 2023). Such different perceptions can have a vast impact on the degree of AI contribution to holistic learning in the cognitive, affective, and psychomotor aspects.

Although scholarly interest in the field of AI in education increases, existing empirical studies have oriented primarily on technological effectiveness, institutional preparedness or instructional design rather than on the perceptions of students as the key determinants of learning outcomes (Allen and Green, 2023; Clarke and Johnson, 2023). Moreover, the empirical data in the Nigerian setting is not comprehensive, and a limited number of studies are conducted to analyze the cohesive impact of awareness, attitude, and willingness of the undergraduates towards AI using a systematic examination of the impact on the overall learning. This gap needs to be filled to make informed policies and pedagogies about learners and institutional structures that can enhance effective and inclusive integration of AI in Nigerian universities.

Statement of the Problem

The growing integration of Artificial Intelligence tool in the teaching and learning in universities has been greatly advocated as a way of improving the quality of education and learning performance by students. Nevertheless, the perceived advantages of AI in higher education are not realised in every situation, especially in developing conditions, as is the case with Nigeria. Although AI technologies are becoming more available to undergraduate students on digital

platforms and online resources, it is not certain that the interaction of students with these technologies leads to better cognitive, affective, and psychomotor learning outcomes. The first issue is that a lot of undergraduate students might not be sufficiently aware of AI applications existing in their academic fields, have positive or negative attitudes towards AI-assisted learning, or show a low level of willingness to use AI-based tools in learning. These perception issues may restrain proper exploitation of AI hence the potential to assist in deep and positive learning dispositions and acquisition of skills. Devoid of positive perceptions, AI tools will be either underused, misused, or viewed as a shortcut instead of educationally significant tools.

In addition, the available literature on AI in Nigerian institutions of higher learning has mostly focused on infrastructure, access, or institutional readiness, and little empirical work has explored perceptual aspects of the students as predictors of learning outcomes. Where perception has been studied, there is suggestion that academic performance or cognitive achievement is the only narrow aspect of study that is not in overview of the affective and psychomotor aspects of learning which are important in undergraduate education. This leaves a major gap in comprehending how the perception of AI by the students in the various areas of learning affects them simultaneously. As a result, empirical data about the influence of undergraduates' awareness, attitude, and willingness towards AI in learning activities in the universities in Nigeria is not sufficient to inform university administrators, lecturers, and policy makers about the role of these attributes in determining the outcome of learning in the country. In the absence of these evidences, any attempt to integrate AI in the higher education setting might be disjointed, ineffective, or not responsive to the needs and learning realities of the students. Thus, there is an urgent need to conduct empirical research into how perceptions by the undergraduates towards AI can affect cognitive, affective and psychomotor learning in Nigerian universities in order to inform pedagogical practices, policy formulation and sustainable strategies of integrating AI.

Objectives

i. Test the awareness rate, attitude, and willingness of undergraduates with AI.
ii. Identify the role of AI perceived in determining cognitive learning.
iii. Determine the impact of AI perception and affective learning outcomes.
iv. Assess the effect of AI perception on learning outcomes of psychomotor learning.

Research Questions

How does awareness of AI affect the learning outcomes among the undergraduates?
What is the impact of AI attitudes on learning?
How predictive is the willingness to use AI in learning outcomes?

Hypotheses

H01: The attitude towards AI has no major impact on learning.

Brief Literature Review

Conceptual Clarifications of Artificial Intelligence

Artificial Intelligence (AI) can be described as the branch of computer science that deals with the creation of computer systems and technologies that can react to human intelligence-related activities, such as learning, reasoning, problem-solving, pattern recognition, language processing, and decision-making. AI systems act by analyzing big data with algorithms, machine learning, and predictive models to create intelligent outputs that enhance further interaction and exposure to data (Acosta-Enriquez and Facil, 2024; Ajiye and Omokhabi, 2025). In the educational environment, the conceptualization of Artificial Intelligence is the use of intelligent digital technologies in the process of teaching, learning, and assessment. AI in education includes more than the traditional educational technologies and allows adapting the learning process, providing feedback and learning analytics, as well as personal instructional guidance. Some of the common AI-based solutions in higher education are intelligent tutoring systems, adaptive learning platforms, automated grading and assessment systems, plagiarism detection software, virtual laboratories, simulations, and conversational agents, like chatbots and generative AI applications (Ojokheta and Omokhabi, 2023; Ojokheta et al., 2025).

Artificial Intelligence in education is essentially learner-focused and focuses on the individualization and responsiveness of the needs, capabilities, and learning paths of individual learners. By using continuous data collection and analysis, AI systems can identify learning gaps and predict academic performance, suggesting custom learning paths, which enhances the effectiveness of instruction and promotes differentiated learning in large and diverse classroom settings (Ajiye et al., 2024). Nevertheless, technological sophistication is not the only factor that defines the efficacy of Artificial Intelligence in learning institutions. The perception of AI tools, preparedness and willingness of students to use them, according to empirical evidence, plays a significant role in the patterns of adoption and student learning outcomes. Favorable attitudes and sufficient readiness contribute to meaningful use, and negative attitudes, insufficient digital literacy, and institutional barriers may be a hindrance to successful use of AI in learning (Ojokheta and Omokhabi, 2023; Omokhabi, 2021). Inequalities in access to digital infrastructure, institutional support, ethical issues, and differences in technological competence are also the challenges in the Nigerian higher education environment that further affect the use and adoption of AI-based learning tools. Research has underlined that the most effective way to ensure the educational advantages of AI are maximized in developing settings is through institutional readiness, building digital skills, and empowering policy frameworks (Ajiye et al., 2024; Omokhabi, 2023; Ketim and Ajiye, 2024). Therefore, the idea of Artificial Intelligence in the given study is not a technological innovation, but an interactive educational tool the effectiveness of which is predetermined by the interaction of technological ability, the perception and the willingness of students, and institutional support networks.

Conceptual Clarifications of Artificial intelligence in education

Artificial Intelligence (AI) in education defines the use of a high-level computational system that can recreate human intelligence processes, including learning, reasoning, problem-solving, pattern recognition, and decision-making, to support, augment, and transform the processes of teaching and learning (Bond, 2024; Wang, 2025). Unlike other past forms of educational technologies that are more focused on content delivery, the AI-driven systems are an ever-adaptive and dynamically oriented education system based on both the behavioral, preferences and performance trends of the learners and thus allow the delivery of educational experiences that are more personalized, responsive, and data-driven. Applications of AI in higher education settings are also implemented in various ways, such as smart tutoring or adaptive learning, intelligent assessment and feedback, learning analytics dashboard, plagiarism detectors, intelligent chatbots, or generative AI (Baig and Yadegaridehkordi, 2024; Letourneau et al., 2025). Intelligent tutoring systems offer tailored instructional support by identifying the strengths and weaknesses of learners and adaptive learning platforms serve to dynamically set content challenge and ordering according to real-time learner information. Artificial intelligence feedback systems and automated assessment tools are more efficient and timely in terms of their provision of feedback to students, who receive feedback that is immediate and formative to improve their learning continuously.

Another important application of AI is learning analytics that allows educational professionals and institutions to process high-levels of learner data to determine learning patterns, predict academic risk, and make pedagogical decisions based on the results. Other support learning tools are conversational agents and generative AI tools, which help students with explanations, academic writing, revision, and problem-solving assignments. Taken together, the applications of AI are already transforming pedagogical practices in the field of higher education by encouraging learner-centered education, flexibility and scalability. Nonetheless, it is always true according to research that the success of AI-based learning facilities is not defined by the technological advanced and presence. Instead, acceptance, perception, and engagement of AI tools by learners are also important determinants of whether the technologies may achieve any educational outcomes (Irving & Lopez, 2023; Li, 2023). However, without the favorable perception and willingness of the students, even the well-designed AI systems will not be used to their full potential, as they will not be appropriately used or utilized. This highlights the need to look at the perceptions of students towards AI as a focal point in the determination of the educational effect of AI in higher education.

Artificial Intelligence perceptions

The perception of Artificial Intelligence in education denotes the awareness, assessment, and willingness of the students to use AI-based learning technologies. It includes the perception of usefulness, relevance, ease of use, trustworthiness and ethical implication of AI tools to academic environment by the learners. Perception of AI in this study is conceptualized on three dimensions that have been presented as related which are awareness, attitude, and willingness. That

conceptualization is consistent with major technology adoption theories, especially the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) that underline that beliefs, attitudes, and behavioral intentions of users are key factors affecting technology use and outcomes (Alzahrani, 2023; Xue, 2024).

Knowledge on Artificial Intelligence

AI awareness can be defined as the knowledge and awareness that students have concerning AI technologies, which can be in terms of their functions, capabilities, limitations, and their possible uses in academic learning. The awareness will be characterized by being familiar with the AI tools, how they can be used to facilitate learning activities, and the ability to see the relevance of the tools to academic activities, including studying, research, assessment, and skill development. The increase in the AI awareness decreases the uncertainty and misunderstandings around the new technologies, making students more confident and eager to learn with the help of the AI-based learning instruments. Empirical data indicate that students who are more aware of AI portray better self-regulated learning, trust in using technologies, and appropriate use of digital learning tools (Adebayo and Ojo, 2023; Carter and Zhou, 2023). The awareness will empower learners to rise above the superficial use of AI tools to more serious and significant use that facilitates deep learning. On the other hand, low awareness can lead to poor use or underuse of AI or dependency on AI to perform shallow learning activities that do not add to higher-order learning. In less developed countries, like Nigeria, the digital exposure gap, as well as access to AI-powered applications and institutional guidance, have a significant effect on the AI awareness rates among students. It has been found out that the uneven infrastructure, the lack of training opportunities, and insufficient institutional policies are the factors that cause the dissimilarity in AI awareness among Nigerian undergraduates (Akintoye and Balogun, 2024; Oguntola, 2024). These differences can, in their turn, influence the way students view AI-assisted learning places and can enjoy the advantages associated with them.

Attitude towards Artificial Intelligence

Attitude toward AI means either positive or negative evaluative judgments of students about the use of AI in learning. It includes the emotional reactions, perceptions, and beliefs of the learners concerning the AI-assisted learning tools, such as usefulness, usability, trust, fairness, and ethical implications. Attitude has been widely known to be a potent predictor of technology acceptance and continued use in learning institutions. Empirical data shows that students who have positive attitudes towards AI will be more willing to use AI-based learning systems, view them as useful, and part of their learning processes (Nakamura and Kim, 2023; Okafor and Adeoye, 2024). The positive attitude to AI is linked to the higher motivation, better engagement, better satisfaction with the learning experiences, and innovation openness. This attitude creates the atmosphere of a learning experience where students are able to consider AI as a helpful resource and not a threat to academic honesty or human agency. On the other hand, fear of the intricacies of technologies,

distrust in automated systems, issues with data privacy, or the perception of academic dishonesty can be among the reasons that prevent meaningful adoption of AI (Baig and Yadegaridehkordi, 2024; Orim et al., 2025). Negative attitudes can be supported in the setting where the ethical standards and institutional support are not provided, which restricts the pedagogical value of AI-enhanced learning.

Readiness to use Artificial Intelligence

Willingness to use AI is the willingness and the intention of the students to use AI tools in their academic practices. It shows how ready learners are to use AI technologies in areas like studying, carrying out assignments, carrying out research, and learning communally. Willingness is a very important intermediary between perception and actual usage behavior, which is closely related to behavioral intention constructs of TAM and UTAUT models (Williams and Xu, 2023). Studies show that the intention to utilize AI is determined by a number of factors such as knowledge of AI capabilities, attitudes toward AI, psychological preparedness, perceived usefulness and institutional support frameworks. The greater willingness to use AI, the higher the possibility of students to experiment with AI tools, implement them in various learning situations, and gain educational value through their use (Budhathoki, 2024; Dlamini and Nkosi, 2024). Low willingness on the other hand could lead to opposition to the use of AI, despite the ready availability of the tools, thus restricting their effectiveness in influencing learning outcomes.

Learning outcomes in Higher Education

Learning outcomes are the knowledge, skills, attitudes and competencies acquired by the students due to the educational experiences. Within the realm of higher education, learning outcomes are usually explored through the prism of three areas, namely, cognitive, affective, and psychomotor. This is a tripartite related classification based on Bloom taxonomy which is able to offer a detailed system of the evaluation of holistic learning. Cognitive learning outcomes entail intellectual skills like knowledge, understanding, analysis, critical thinking and problem solution. AI-based learning applications facilitate cognitive growth by providing customized feedback, adaptive learning patterns, and chances of higher-level thought (Brown and Smith, 2023). Affective learning outcomes pertain to the motivation, interest, attitudes, values and emotional responses to the students in regard to the learning. Learning environments based on AI can have a beneficial effect, as they can improve the sense of autonomy, engagement, and satisfaction among learners (Mitchell and Owen, 2023). Psychomotor learning outcomes lay stress on the development of practical, technical, and manipulative skills, and these skills are particularly applicable in science, technology, and professional fields. Simulations, virtual laboratories, and augmented learning environments are examples of AI technologies that offer safe and repeatable chances to exercise and learn new skills (Liang et al., 2025; Singh and Sharma, 2025).

Empirical Review and Research Gap

Empirical research in a wide variety of international settings has also repeatedly found positive correlations between the perception of AI that students have and their learning outcomes. The studies note that AI awareness positively correlates with student confidence and self-efficacy, positive attitudes with engagement and motivation, and the desire to use AI with successful adoption and learning outcomes (Bello and Mensah, 2023; Johnson and Moore, 2023). Nevertheless, there is little and disjointed empirical data on the subject in Nigeria, and most studies are focused on cognitive learning or technology adoption patterns (Nelson and Price, 2023; Thompson and Uche, 2023). Not many studies are based on an integrated, learner-centered, method that is capable of investigating the parameters of awareness, attitude, will and overall learning outcomes in cognitive, affective and psychomotor terms. As a result, there is a lack of empirical knowledge of the role played by the perceptions of the Nigerian undergraduates towards AI in determining the efficacy of AI-rich learning experiences. This paper fills this gap through the empirical research that investigates the relevance of the perceptions of Artificial Intelligence to the undergraduates in predicting holistic learning outcomes in universities in Nigeria.

Social Cognitive Theory, (SCT, 1986) by Bandura

The research is anchored on the Social Cognitive Theory (SCT, 1986) developed by Bandura, according to which the process of learning occurs as the result of a fruitful interaction of the personal, environmental and behavioral factors. According to SCT, reciprocal determinism is an important aspect because the perception and willingness of students towards AI, their interaction with AI tools, and their learning environment continuously affect each other. The willingness and intention to work with AI among students is influenced by personal factors such as awareness, attitudes and willingness to use AI, self-efficacy and motivation. The situations that are favorable or limiting to meaningful AI use are environmental, including the presence of institutional infrastructure, peer practices, instructor support, and access to AI resources. Behavioral factors represent the actual interaction with AI, including working in virtual lab, simulation, adaptive learning platform, and collaborative AI-enabled activities, which subsequently influences the outcomes of learning. The concept of reciprocal determinism describes the relationship between perception and readiness and AI engagement, which in turn supports the positive attitudes, motivates more, and institutions are also motivated. Using SCT, the study will investigate how personal dispositions of undergraduates toward AI through the environmental support influence the overall learning outcomes in cognitive, affective, and psychomotor aspects. Cognitively, students who have greater self-efficacy and institutional support have a higher likelihood of acquiring knowledge, solving problems, and critical thinking under the use of AI. Positive attitudes and motivational reinforcement provide engagement, confidence and satisfaction affectively. When available to AI-based simulations and practical platforms, psychomotor results are improved, as the theoretical knowledge is converted into applied skills. SCT is thus especially

relevant in this case since it represents the dynamic and two-way interaction of personal, behavioral, and environmental conditions, which can be offered a holistic model of perception and readiness predicting the use of AI and its further influence on holistic learning outcomes in Nigerian universities.

Methodology

The research design used was descriptive survey research to investigate how the perceptions of undergraduates toward Artificial Intelligence (AI) affect the learning outcome in Nigeria universities. The study population included the undergraduate students in the public and private universities in Ibadan Metropolis, Oyo State, Nigeria. A multi-stage sampling method was used to stratify the respondents from the universities, where the ownership of the universities (public and private) was first stratified, followed by proportionate stratified sampling to identify the respondents per institution. A total population of 60,369 students was used to give a sample of 398 undergraduates based on the formula given by Yamane (1967) at 5% margin of error. A structured questionnaire was used to gather the required data, which was called Undergraduates Perceptions and Readiness towards the Use of Artificial Intelligence Questionnaire (UPRAIQ). To conduct this study, the researcher has employed Section B of the instrument to understand perceptions of AI in students (awareness, attitude, and willingness), whereas Section D focused on learning outcomes in cognitive, affective, and psychomotor realms. The rating was done on a four-point Likert scale of Strongly Agree to Strongly Disagree.

Content and face validity had been applied to the instrument by expert review in educational technology and measurement, where reliability testing using Cronbach Alpha gave it a coefficient of 0.74 giving it an acceptable internal consistency. The questionnaires were given to the respondents directly by using the help of trained research assistants which guaranteed a high response rate. Descriptive and inferential statistics were used in the analysis of data. The description of perception of students about AI and learning outcomes were described with the means and standard deviation and the multiple regression analysis was undertaken to find out how many of the perception of AI (awareness, attitude, and willingness) influenced cognitive, affective, and the psychomotor learning outcomes. Each of the hypotheses was checked at the level of significance 0.05. Relevant university authorities gave their ethical approval and informed consent, confidentially and voluntary participation were strictly followed.

Results

Table 1: Demographics Section

Demographic Variable	Category	Frequency	Percent (%)
Gender	Male	155	52.0
	Female	143	48.0
Institution Type	Public Universities	245	82.2
	Private Universities	53	17.8
Level of Study	100 Level	56	18.8
	200 Level	81	27.2
	300 Level	95	31.9
	400 Level	66	22.1
Age Group (years)	16–19	62	20.8
	20–23	142	47.7
	24–27	72	24.2
	28 and above	22	7.3
Total Respondents	–	298	100.0

Source: Researcher's Fieldwork, 2025

The table 1 shows the demographic data of the 298 undergraduate respondents of the diverse demographics of 155 males (52.0%) and 143 females (48.0%), thus, there was very little gender bias. Most of the respondents were undertaking public Universities (245; 82.2 percent) but 53 (17.8 percent) were in private institutions, which represent the fact that the population of tertiary institutions in Ibadan Metropolis is usually more in the public Universities. The participants were spread across all the academic levels with the highest number of 300 Level (95; 31.9%) and the lowest number of 100 Level (56; 18.8) which gave a wide representation of the students at varying levels of their study. Age-wise, the figures were almost equal with almost half of them aged between 20 and 23 years (142; 47.7%), 2427 years (22; 7.3) traditional-age undergraduates. In general, the demographic data show a reflection of diversity in terms of gender, institution type, academic level, and age which improves the reliability and generalizability of the study findings on the subject of AI preparedness and its role on the outcome of learning.

Research Question 1: What is the influence of undergraduates' awareness of AI on learning outcomes?

Table 4.3.1: Students' Awareness of AI in Learning

S/N	Item	SA (%)	A (%)	D (%)	SD (%)	Mean	SD
1	I am aware of the use of Artificial Intelligence in modern education	128 (43.0)	112 (37.6)	38 (12.8)	20 (6.6%)	3.17	0.96
2	I know some common AI tools or applications that can support learning	109 (36.6)	114 (38.3)	52 (17.4)	23 (7.7)	3.04	0.98
3	I have been exposed to discussions or trainings on AI in my university	92 (30.9)	87 (29.2)	75 (25.2)	44 (14.8)	2.76	1.05
4	I believe AI is increasingly being integrated into higher education globally	136 (45.6)	102 (34.2)	42 (14.1)	18 (6.0)	3.20	0.94
5	I am familiar with AI applications such as chatbots, adaptive learning, or automated feedback	101 (33.9)	113 (37.9)	59 (19.8)	25 (8.4)	2.97	0.98
6	I have observed or heard of AI being used by my peers in their studies	96 (32.2)	111 (37.2)	63 (21.1)	28 (9.4)	2.92	0.99
7	I can distinguish between traditional learning tools and AI-based tools	117 (39.3)	107 (35.9)	54 (18.1)	20 (6.7)	3.08	0.97
Weighted Mean = 3.02							

Source: Researcher's Fieldwork, 2025

Threshold 3.00 (High), 2.5-2.99 (Moderate) and 2.50 (Low)

Table 2 represents that the knowledge of AI in learning tended to be high among the students (Weighted Mean = 3.02). Things like the understanding of the global integration of AI (Mean = 3.20) and the knowledge of AI in contemporary education (Mean = 3.17) posted highest.

Nevertheless, the direct exposure to the AI-related discourse/trainings was less (Mean = 2.76), which indicates that the awareness is high, but the institutional level of engagement is low.

Research Question 2: How do attitudes toward AI affect learning outcomes?

Table 3: Students' Attitudes towards AI in Learning

S/N	Item	SA (%)	A (%)	D (%)	SD (%)	Mean	SD
1	I believe AI can make learning easier and more engaging	142 (47.7)	106 (35.6)	32 (10.7)	18 (6.0)	3.25	0.92
2	I see AI as a positive innovation in education	136 (45.6)	112 (37.6)	30 (10.1)	20 (6.7)	3.22	0.93
3	I feel comfortable with the idea of using AI for academic purposes	117 (39.3)	109 (36.6)	45 (15.1)	27 (9.0)	3.06	0.98
4	I believe AI can enhance critical thinking and creativity in learning	127 (42.6)	102 (34.2)	47 (15.8)	22 (7.4)	3.12	0.96
5	I trust AI-based tools to provide accurate and useful information	110 (36.9)	107 (35.9)	53 (17.8)	28 (9.4)	3.00	0.99
6	I think AI can complement, rather than replace, the role of lecturers	129 (43.3)	104 (34.9)	45 (15.1)	20 (6.7)	3.15	0.95
7	I believe AI adoption in learning should be encouraged in Nigerian universities	140 (47.0)	110 (36.9)	31 (10.4)	17 (5.7)	3.25	0.91

Weighted Mean = 3.15

Source: Researcher's Fieldwork, 2025

Key: 4 = Strongly Agree (SA), 3 = Agree (A), 2 = Disagree (D) and 1 = Strongly Disagree (SD).

Threshold: Mean of 3.00 (High), 2.5-2.99 (Moderate) and 2.50 (Low)

Table 3 shows that the attitude of undergraduates towards AI was very high (Weighted Mean = 3.15). There was a strong agreement among students that AI made learning interesting (Mean = 3.25) and must be promoted in the Nigerian universities (Mean = 3.25). Although the level of trust

in the tools based on AI was lower (Mean = 3.00), it also demonstrated positive views. On the whole, students have positive and encouraging perspectives on the use of AI in teaching.

Research Question 3: To what extent does willingness to use AI predict learning outcomes?
   Table 4.3.3: Students' Willingness to Use AI in Learning

S/N	Item	SA (%)	A (%)	D (%)	SD (%)	Mean	SD
1	I am willing to try AI tools to improve my academic performance	139 (46.6)	112 (37.6)	29 (9.7)	18 (6.1)	3.25	0.92
2	I would recommend AI-based learning tools to my friends or colleagues	130 (43.6)	115 (38.6)	34 (11.4)	19 (6.4)	3.19	0.94
3	I am willing to learn how to use AI applications for my studies	135 (45.3)	110 (36.9)	34 (11.4)	19 (6.4)	3.21	0.93
4	I am interested in using AI to complete academic tasks more efficiently	132 (44.3)	113 (37.9)	35 (11.7)	18 (6.1)	3.20	0.93
5	I would actively seek out AI platforms if they are made available	128 (43.0)	112 (37.6)	38 (12.8)	20 (6.6)	3.17	0.95
6	I am open to replacing some traditional study methods with AI-assisted ones	122 (40.9)	108 (36.2)	44 (14.8)	24 (8.1)	3.10	0.97
7	I am willing to attend workshops or training sessions on AI for learning	136 (45.6)	107 (35.9)	33 (11.1)	22 (7.4)	3.19	0.95

 Weighted Mean = 3.19

Source: Researcher's Fieldwork, 2025
Key: 4 = Strongly Agree (SA), 3 = Agree (A), 2 = Disagree (D) and 1 = Strongly Disagree (SD).
Threshold: Mean of 3.00 and above (High), 2.5-2.99 (Moderate) and 2.5-2.00 (Low)
The Table 4 indicates that students are willingness to use AI (Weighted Mean = 3.19). The highest scores of willingness were making attempts to use AI tools to enhance performance (Mean = 3.25) and willingness to participate in training (Mean = 3.19). This is an indication of willingness to

embrace the use of AI in the learning process when resources and institutional reinforcement is in place.

Test of Hypotheses

H₀1: There will be no significant relative influence of undergraduates' perceptions of artificial intelligence (awareness, attitude, and willingness) on learning outcomes (cognitive, affective, and psychomotor) in universities within Ibadan Metropolis.

Table 5: Summary of Regression Analysis showing the Relative Contribution of Awareness, Attitude, and Willingness on Learning Outcomes of Undergraduates in Universities within Ibadan Metropolis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	12.104	1.285		9.421	0.000
	Awareness	0.412	0.081	0.298	5.086	0.000
	Attitude	0.587	0.093	0.365	6.312	0.000
	Willingness	0.276	0.089	0.188	3.101	0.002

a. Dependent Variable: Learning Outcomes (Cognitive, Affective, Psychomotor)

Source: Researcher's Fieldwork, 2025

The table 5 shows the regression coefficients which describe the relative effect of awareness, attitude and willingness on the learning outcomes of undergraduates in the universities of Ibadan Metropolis. This constant term (12.104, $p < 0.05$) is very significant meaning that even in the absence of the perception variables, there is a minimum level of learning outcomes among students. It has a significant and positive influence (B = 0.412, 0.298, t = 5.086, $p < 0.05$). This implies that the more students become aware of AI, the better their learning results become. Compared to other factors, the awareness accounts for the approximately 29.8% variance in the learning outcomes, which is very important in modifying cognitive and affective gains. The most positive impact (B = 0.587, 0.365 t = 6.312, $p < 0.05$) is made by attitude. This demonstrates that positive perceptions towards AI have a strong positive effect on the learning outcomes of students on the cognitive, affective, and psychomotor levels. It is the strongest predictor between the three variables.

There is also willingness, which has a positive and significant impact (B = 0.276, 0.188, t = 3.101, p =.002). Willingness to adopt AI-based learning tools, on the one hand, is a significant predictor of higher performance despite being smaller in terms of its influence compared to attitude and awareness. The null hypothesis (H 0 1) is rejected because all the three predictors obtained the value of statistically significant at the 0.05 level. This implies that the perceptions of AI amongst the undergraduates: awareness, attitude and willingness; each exert substantial relative effect on

the outcomes of their learning. Consequently, the findings indicate that the strongest impact is on attitude, then on awareness, and lastly on willingness which indicates that positive orientation and readiness towards AI technologies play an important role in maximizing learning in universities in Ibadan Metropolis.

Conclusion

This paper explored the perception of undergraduates towards Artificial Intelligence and how this determines cognitive, affective, and psychomotor learning in higher institutions in Nigeria. The results indicate that the level of AI awareness in the group of undergraduate students is rather high, the attitudes towards its application to learning are positive, and the desire to use AI-based tools in the learning process is high. All these perceptual factors form a positive contribution towards better learning outcomes in all the three learning domains. The multiple regression model showed the existence of significant effects of perception towards AI in terms of learning outcomes hence rejecting the null hypothesis. Of the perceptual variables, attitude towards AI was a strong predictor, then awareness and willingness. It means that affective orientations of students towards AI are a more decisive parameter that needs to define learning engagement, motivation, and performance, although the knowledge about AI and readiness to use AI is also significant. The paper concludes that the success of AI adoption by universities in Nigeria does not entirely depend on the technological presence there but heavily permeated by student perceptions. To transform AI tools into valuable educational outcomes, positive awareness, attitudes, and willingness are required. As such, to create holistic learning outcomes in higher education, it is essential to improve the perception of AI among the students.

Implications of the Study

Educational Implications: The results suggest that AI can be used to considerably improve cognitive, affective, and psychomotor learning outcomes in case students have a positive attitude toward its use. Universities are thus not just supposed to provide AI technologies, but to also impart knowledge and acceptance of the tools to the students. The use of AI applications by lecturers can encourage higher-level thinking, innovation, interaction and development of practical skills.

Policy Implications: The findings highlight the importance of institutional and national policies that can regulate the process of implementing AI in higher education. The policymakers are expected to consider the student perceptions as a focal point in the adoption of AI and formulate policies that generate awareness, fair use, and capacity building. The implementation of AI literacy in higher educational institutions can contribute to standardizing the exposure of students and narrow the gap in the use of AI.

Theoretical Implications: The research offers empirical evidence to the technology acceptance models like the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) in the case of the Nigerian university. The study has proven that

these theories are relevant to holistic learning outcomes, not only to the use of technology by showing that awareness, attitude, and willingness are very much predictive of learning outcomes. Practical Implications: In practice, the results indicate that AI-enhanced learning environments will be more beneficial to the students when they feel that AI is helpful, engaging, and supportive. To maintain a positive perception and outcome, universities are therefore advised to establish AI-based learning experiences that are user-friendly, applicable to the pedagogy, and relevant to the academic needs of the students.

Recommendations

In the light of the results of this research, the following recommendations are put across:

AI Awareness: To enhance awareness of AI tools and their use in academic work, universities ought to conduct a series of workshops, seminars, and orientation programs that enhance the awareness of AI among the students. Greater exposure will facilitate the conversion of conceptual awareness into the effective learning practices.

Fostering Good Disposition towards AI: Lecturers and administrators ought to put forward the beneficial aspect of AI in learning but not portray it as one that replaces human teachings. The practice of successful AI-assisted learning may help to increase the trust and positive attitudes of students.

Organized AI Training courses: Universities ought to offer practical learning opportunities whereby students will be taught practical AI skills. This training will improve the results of psychomotor learning and stimulate the readiness to continue using AI tools.

Curriculum Placing AI Literacy in the Curriculum: AI literacy must be integrated in all fields so that undergraduates can have equal access to AI and grow at the same rate. This will decrease the use of AI technologies based on informal or undirected use.

Supportive Institutional Policies Development: The management and policymakers of the university are expected to develop effective guidelines concerning ethical, responsible, and pedagogically appropriate use of AI in teaching and learning in order to benefit the maximum and harm the least.

References

Acosta-Enriquez, B. G., & Facil, A. (2024). Acceptance of artificial intelligence in university contexts: A UTAUT2 analysis. *Computers in Human Behavior, 150*, 107–122.

Adebayo, M., & Ojo, F. (2023). Artificial intelligence awareness and academic performance of undergraduate computer science students. *Journal of Digital Education Research, 2*(1), 45–59.

Ahmedi, P. K., Kurshumlija, A., & Ismajli, H. (2023). Teachers' attitudes towards constructivist approach to improving learning outcomes: The case of Kosovo. *International Journal of Instruction, 16*(1), 441–454.

Ajiye, O. T., & Omokhabi, A. A. (2025). The potential and ethical issues of artificial intelligence in improving academic writing. *ShodhAI: Journal of Artificial Intelligence, 2*(1), 1–9. https://doi.org/10.29121/ShodhAI.v2.i1.2025.241

Ajiye, O. T., Oyelowo, A. O., & Adejuwon, A. M. (2024). The role of digital technologies in the development of inclusive learning ecosystems in Nigeria. *International Journal of Continuing and Non-Formal Education, 11*(2), 16–31.

Akintoye, R., & Balogun, O. (2024). Readiness of Nigerian universities for AI tools. *Nigerian Educational Technology Journal, 27*(2), 89–107.

Alhassan, C., & Boateng, L. (2024). Institutional support and faculty development in AI integration. *International Journal of Educational Research, 126*, 101–118.

Allen, C., & Green, R. (2023). Artificial intelligence and student engagement in higher education. *Journal of Educational Technology Research, 45*(1), 15–32.

Almulla, M. A. (2023). Constructivism learning theory: A paradigm for students' critical thinking, creativity, and problem-solving to affect academic performance in higher education. *Cogent Education, 10*(1), 217–232.

Alzahrani, A. (2023). An analysis of the technology acceptance model (TAM) in understanding faculty's behavioral intention to use the Internet of Things (IoT). *International Journal of Educational Research and Innovation, 19*, 153–169.

Baig, M. I., & Yadegaridehkordi, E. (2024). ChatGPT in higher education: A systematic literature review and research challenges. *International Journal of Educational Technology in Higher Education, 21*(1), 1–28.

Bayaga, A. (2024). Ramifications of the unified theory of acceptance and use of technology (UTAUT): Limitations and future research. *Education and Information Technologies, 29*(4), 4513–4534.

Bello, A., & Mensah, C. (2023). Synergistic effects of awareness, attitudes, and willingness on student learning outcomes in AI-based education. *Contemporary Studies in Educational Technology, 3*(4), 88–106.

Bond, M. (2024). A meta-systematic review of artificial intelligence in higher education. *International Journal of Educational Technology in Higher Education, 21*(1), 1–34.

Budhathoki, T. (2024). Psychological readiness for AI in higher education: Student perspectives. *Education and Information Technologies, 29*(5), 6147–6165.

Cabero-Almenara, J., Palacios-Rodríguez, A., Loaiza-Aguirre, M., & Andrade-Abarca, P. (2024). The impact of pedagogical beliefs on the adoption of generative AI in higher education: A predictive model from UTAUT2. *Frontiers in Artificial Intelligence, 7*, 149–164.

Çibukçiu, B. (2025). The relationship between constructivist approach and inclusive education in primary school. *Frontiers in Education, 10*, Article 1600711.

Crompton, H., & Burke, D. (2023). Institutional readiness for AI in higher education: A comparative study. *Australasian Journal of Educational Technology, 39*(2), 25–45.

Du, Z. (2024). The application of constructivist educational theory in classroom practice in higher vocational colleges. *International Journal of Education & Learning, 11*(2), 137–152.

Feng, J. (2025). Key factors influencing educational technology adoption in higher education: A UTAUT-based systematic review. *Education and Information Technologies, 10*(2), 1–15.

Létourneau, A., Deslandes Martineau, M., Charland, P., Karran, J. A., Boasen, J., & Léger, P. M. (2025). A systematic review of AI-driven intelligent tutoring systems in K–12 and higher education. *NPJ Science of Learning, 10*, Article 29.

Li, K. (2023). Determinants of college students' actual use of AI-based systems: An extension of the technology acceptance model. *Sustainability, 15*(6), Article 5221.

Ojokheta, K., & Omokhabi, A. A. (2023). Project initiatives on inclusive and equitable use of artificial intelligence in education: Lessons for policy direction in Nigeria. *COUNS-EDU: The International Journal of Counselling and Education, 8*(3). https://doi.org/10.23916/002030845430

Omokhabi, A. A. (2021). Technology and parenting in the digital age: Opportunities and risks. *African Journal of Adult Learning, 1*, 37–56.

Omokhabi, A. A. (2023). Using digital technology to enhance adolescent and young adult development: Implications for child welfare in Nigeria. *Simulacra, 6*(1), 1–16.

Omokhabi, U. S., Omilani, M. A., Adegbite, O. O., & Omokhabi, A. A. (2025). The dark side of online learning: Examining cyberbullying and student engagement. *Unizik Journal of Educational Research and Policy Studies, 19*(2), 388–404.

Ukpabi, D. I., & Ajiye, O. T. (2025). Technologies in literacy education research. *Unizik Journal of Educational Research and Policy Studies, 19*(2), 364–376.