KNOWLEDGE, PERCEPTION AND USE OF ARTIFICIAL INTELLIGENCE AMONG STUDENTS OF UNIVERSITY OF BENIN, BENIN CITY, NIGERIA

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BEING A ONE-YEAR PROJECT PRESENTED TO THE DEPARTMENT OF PUBLIC HEALTH AND COMMUNITY MEDICINE, SCHOOL OF MEDICINE, COLLEGE OF MEDICAL SCIENCES, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE, NIGERIA.

IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE BACHELOR OF MEDICINE AND BACHELOR OF SURGERY (MBBS) DEGREE IN THE UNIVERSITY OF BENIN, BENIN CITY

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DEDICATION

This work is dedicated first and foremost to God Almighty, for His unending grace, wisdom, strength, and unwavering faithfulness throughout the course of this study and our entire academic journey.

We also dedicate this work to our beloved parents, for their sacrifices, wise counsel, unwavering support, encouragement, and prayers that formed the foundation of our education and personal growth. Our gratitude to knows no bounds.

DECLARATION

We hereby declare that this research project titled "Knowledge, perception and use of artificial intelligence among students of University of Benin, Benin City, Nigeria" was conducted under supervision and has not been submitted in part or in full for any purpose.

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CERTIFICATION

This was to certify that this research study titled "Knowledge, perception and use of artificial intelligence among students of University of Benin, Benin City, Nigeria" was conducted by Promise Tolulope Agbonidia with matriculation number MED1807356 and Osarumwense Aibangbee with matriculation number MED1807361 under the supervision of Prof. Vivian Omuemu in the Department of Public Health and Community Medicine, College of Medical Sciences, University of Benin as part of the requirements for the award of Bachelor of Medicine, Bachelor of Surgery (MBBS) degree.

_____	_____
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I owe a special debt of gratitude to my parents, the late Mr. Christopher Agbonidia and Mrs. Opeyemi Aluko Agbonidia, without whom I would not be where I am today. Their sacrifices, love, and unwavering support have shaped my journey and made this achievement possible.

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My heartfelt thanks go to my parents, the late Mr. Edwin Osamudiamen Aibangbee and Mrs. Victoria Aibangbee, for their unwavering support, my elder sister for her care, and my younger siblings for their belief in me.

To my project partner, thank you for making the journey lighter.

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
AIED	Artificial Intelligence in Education
CAID	Centre for Artificial Intelligence Development
CBT	Computer-Based Testing
DRID	Directorate of Research, Innovation and Development
FGN	Federal Government of Nigeria
MIL	Media and information Literacy
NLP	Natural Language Processing

SSA	Sub-Sahara Africa
TAM	Technology Acceptance Model
TAME	Technology Acceptance Model Extension
UNESCO	United Nations Educational, Scientific and Cultural Organization
UTAUT	Unified Theory of Acceptance Model Extension
TAME	Technology Acceptance Model Extension
NLP	Natural Language Processing

DEFINITION OF TERMS

Artificial Intelligence: a field of science that studies how to create machines that can learn, reason, and act like humans. It is a set of technologies that enables computers to perform a variety of advanced functions, including the ability to see, understand and translate spoken and written language, analyse data, make recommendations, and more.

AI Literacy: The ability to understand, evaluate, and effectively engage with AI technologies. It includes knowledge of how AI works, its applications, ethical concerns, and the ability to use AI tools responsibly and effectively.

ChatGPT: A conversational AI model developed by OpenAI capable of generating human-like responses. It is used in education for brainstorming, summarizing, writing assistance, and research support.

Deep Learning: A specialized form of machine learning that uses neural networks with multiple layers to model complex patterns in large datasets.

Digital Divide: The gap between individuals or groups with access to modern information and communication technologies (like AI) and those without such access, often due to infrastructural, economic, or educational disparities.

Grammarly: An AI-powered writing tool that aids in grammar correction, clarity improvement, and plagiarism detection, widely used by students in academic writing.

Generative AI: A category of AI models (e.g., ChatGPT, DALL·E) that can generate new content, such as text, images, or audio, often used for summarizing, rephrasing, or content creation in academic settings.

IBM Watson: An AI platform offering various capabilities, including language processing, data analysis, and personalized learning support.

Machine Learning (ML): A subset of AI that enables systems to learn from data and improve performance over time without being explicitly programmed.

Neural Networks: AI systems inspired by the structure of the human brain, used especially in deep learning to recognize patterns in data.

Student: a person who is studying at a university or other place of higher learning in order to enter a particular profession.

Technology Acceptance Model (TAM): A theoretical model used to explain how users come to accept and use technology, focusing on perceived usefulness and perceived ease of use.

ABSTRACT

BACKGROUND: Artificial Intelligence (AI) is transforming higher education globally, yet data on AI knowledge, perception, and usage among Nigerian university students remain limited. Understanding these factors is essential for effective curriculum integration and preparing students for an AI-driven workforce.

OBJECTIVE: This study assessed the knowledge, perception, and use of Artificial Intelligence among students of the University of Benin, Benin City, Nigeria.

METHODS: A descriptive cross-sectional study was conducted among 603 undergraduate students selected using multistage random sampling from six faculties. Data were collected using a structured pretested, self-administered questionnaire and analysed with IBM SPSS version 27. Associations between sociodemographic factors and knowledge/perception/use were tested using chi-square and logistic regression, with statistical significance set at $p < 0.05$ (95% CI).

RESULTS: The mean age of respondents was 19.9 ± 2.87 years and majority were females 355 (58.9%). Overall, 340 (56.4%) demonstrated good knowledge of AI, while 427 (70.8%) held positive perceptions. High AI usage was reported by 329 (54.6%) respondents, with ChatGPT being the most commonly used platform 450 (32.8%). Significant predictors of good knowledge included female sex (OR = 1.980, p = 0.001), being in the Faculty of Medicine (OR = 14.069, p = 0.001), and higher academic level (OR = 1.717, p = 0.020). Positive perception was significantly associated with high AI usage (OR = 8.020, $p < 0.001$) and excellent internet access (p = 0.041). AI usage was significantly influenced by positive perception (OR = 2.087, p = 0.025), peer interest (OR = 0.423, p = 0.004), and access to online learning platforms (OR = 0.528, p = 0.037). The most common concerns about AI were that it

can make students lazy (19.2%), produce inaccuracies (15.8%), and pose data privacy risks (10.8%).

CONCLUSION: More than half of University of Benin students demonstrated good knowledge and positive perceptions of AI, with high usage reported by over half of respondents. However, disparities exist by sex, faculty, and academic level. Targeted interventions, including curriculum integration, infrastructure improvement, and faculty development, are recommended to enhance AI literacy and responsible use.

KEYWORDS: Artificial Intelligence; knowledge; perception; use; university students; Nigeria; University of Benin

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

The concept of Artificial Intelligence (AI) dates back to antiquity, with myths of artificial beings possessing intelligence appearing in Greek and Chinese traditions. However, modern AI began in 1956, when John McCarthy coined the term "Artificial Intelligence" at the Dartmouth Conference.[1] Early AI research focused on symbolic reasoning, leading to the development of expert systems in the 1970s and 1980s. During the 1990s and early 2000s, AI saw significant progress with the advent of machine learning, neural networks, and deep learning models.[2]

Globally, AI has emerged as a key driver of innovation, transforming industries such as education, healthcare, finance, and transportation by enabling rapid data processing, improved decision-making, efficiency, and personalization, ultimately allowing for a more tailored and efficient approach to learning and work.[3]

Artificial Intelligence has revolutionized various sectors, including education, by enhancing teaching, learning, and administrative processes. AI-driven tools such as ChatGPT, Grammarly, and AI-based research assistants are increasingly being used in universities worldwide to improve students' engagement and academic performance.[4] Universities plays a vital role in shaping a knowledgeable and responsible society, but they are not immune to the transformative impact of Artificial Intelligence. To remain relevant, these institutions must evolve and integrate AI training into various academic programmes, extending beyond computer science. This ensures graduates are equipped to meet the demand of the future job market, where AI literacy skill will

be a highly valued skill.[5] Universities are incorporating AI-driven tools for automated grading, plagiarism detection, personalized learning, and academic research assistance.[6] AI-based chatbots and virtual assistants such as ChatGPT, IBM Watson, Google Bard, and Grammarly have enhanced access to information, revolutionizing student learning experiences.[7] Students can quickly grasp complex topics and refine their understanding through AI-generated explanations. Additionally, it fosters skill development by enhancing digital literacy, content creation and analytical thinking.

Tools like ChatGPT aid in writing, problem-solving, and programming, helping students become more proficient in their studies. Google bard now referred to as Gemini can assist with language learning, research, and content creation, while IBM Watson can provide personalized learning, research assistance, and automated grading. Students can use Grammarly for academic writing, assignment submission, thesis, and dissertation writing. Grammarly helps to improve grammar and syntax, enhance clarity and concision, plagiarism detection and to save time.[6] Understanding how students interact with and perceive AI is essential for seamlessly incorporating AI technologies into education-whether as a subject, teaching tool, or student aid. By doing so, universities can foster a generation of AI-savvy professionals who can navigate, innovate, and thrive in an AI-driven world. Ultimately, this innovation will enable universities to stay at the forefront of technological advancement, while providing students with a future-proof education.

Despite these advancements, challenges persist regarding ethical considerations, data privacy, digital literacy, and accessibility. The perception of AI varies among students, with some viewing it as a tool for academic success, while others express concerns about job displacement, bias in AI models, and over-reliance on technology for cognitive tasks.[8]

The Digital Education Council Global AI Student Survey in 2024 shows that many students worldwide are already using AI in their studies, marking a shift from theoretical to practical applications, and reflecting a global transition from one-size-fits-all education to a model that individualized learning experience.[9] For example, intelligent tutoring systems and AI-powered platforms are transforming education by providing personalized learning experiences, real-time feedback, and adaptive teaching materials, ultimately leading to improved learning outcomes and increased student engagement worldwide.[10]

Researches on AI awareness in Nigerian universities indicate that engineering, computer science, and business students exhibit higher AI proficiency than those in humanities and social sciences.[11] Additionally, studies indicate that students' readiness for using AI support services is influenced by factors like perceived usefulness and ease of use. Misconceptions about AI such as fears of job automation and ethical dilemma impact students' willingness to engage with AI-driven tools for academic purposes.[12] While AI adoption is increasing globally, students' knowledge and perception of AI vary based on technological exposure and academic background. In Nigeria, particularly at the University of Benin, understanding how students interact with AI will provide insights into improving AI literacy, addressing misconceptions, and fostering responsible AI usage.

1.2 PROBLEM STATEMENT

Globally, despite the increasing use of AI tools such as ChatGPT, intelligent tutoring systems, and automated assessment platforms, a significant knowledge gap persists between the superficial use and the comprehensive AI literacy required to maximize its full potential for educational advancements. Global survey shows that while 86%

of university students use AI tools in some capacity, only about 42% report having a deep understanding of these technologies.[9]

AI adoption in Africa remains significantly low due to limited knowledge and awareness, infrastructural deficits, poor internet connectivity, and inadequate policy frameworks, with only 28% of African universities having AI-specific policies, resulting in fragmented integration efforts, and limited student access to AI-powered learning tools.[13]

Sub-Saharan Africa (SSA) faces significant challenges in AI adoption, ranking lowest in the 2023 Government AI Readiness Index, with no country among the top 50 nations prepared to harness its benefits, underscoring the region's challenges in adopting and integrating AI technologies effectively.[14] Studies show that fewer than 30% of universities in SSA have integrated dedicated AI modules into their curricula, exacerbating the digital divide and hindering the development of robust AI competencies that are crucial for competing in the global digital divide.[15]

The gap between Nigeria's current reality and the global ideal in AI adoption has far-reaching implications, exacerbating the digital divide, leading to suboptimal learning outcomes, and diminished global competitiveness, which may worsen as the global AI education market grows from $1.1 billion in 2020 to $12.6 billion by 2027, potentially leaving Nigerian graduates underprepared for a technology-driven world unless significant interventions are made to tap into AI's benefits.[16]

In Nigeria, university students possess only a rudimentary understanding of AI technologies with studies revealing significant gaps in their understanding of AI potential with only 46% of Nigerian students reporting awareness and even fewer using them effectively for learning.[17,18] Funding constraints significantly limit the

acquisition of essential AI infrastructure, such as adaptive learning platforms and automated tools for research and teaching.[19, 20] Issues such as unreliable power supply, limited internet access, and inadequate digital tools continue to impede the adoption of AI technologies in Nigerian universities.[17, 21] The lack of access to AI tools disproportionately affects students from less privileged backgrounds, exacerbating existing inequalities.[18, 22]

Without AI, students miss opportunities for personalized learning, efficient grading, and real-time feedback. Processes like admissions, student support, and grading could benefit from automation, but they remain manual, leading to delays and inefficiencies.[21,22] Limited AI adoption hinders Nigeria's capacity to train skilled graduates capable of contributing to national development goals.[21] Fragmented and underfunded interventions, including pilot workshops, elective digital literacy courses, and government-led initiatives, have been attempted to boost AI awareness and integration, but these efforts have not been scaled adequately across public and private institutions, leaving many students without necessary support to develop meaningful AI competencies.[18, 22]

University students acknowledge the potential of AI to enhance educational quality and personalize learning experiences. However, there is a notable gap between their awareness of its benefits and practical application in their academic pursuits. Students utilize AI tools, such as ChatGPT, primarily for brainstorming, summarization, and research assistance, demonstrating an appreciation for its capabilities. Nevertheless, they often lack the necessary skills to effectively integrate it into their academic work. Furthermore, while students find AI helpful in simplifying complex information, they express concern regarding its factual accuracy and classroom learning applications.[23] This disparity suggests that without targeted interventions, students may be unable to

fully leverage AI technologies, potentially hindering their academic growth and competitiveness in an AI-driven world.

The identified gaps in AI knowledge and perception among university students may lead to several adverse outcomes which includes underutilization of educational tools as students may miss opportunities to enhance their learning through AI-driven resources. For example, while AI tools can assist in various educational tasks, a lack of understanding may prevent students from utilizing these resources effectively.[24] Skill deficiency is another adverse outcome as graduates may enter the workforce without essential AI competencies, affecting their employability and career progression. The increasing integration of AI across industries necessitates a workforce proficient in AI applications. Resistance to technological integration is also an adverse outcome in the sense that a lack of understanding could foster apprehension or resistance to adopting new AI-based educational methodologies. Educators have noted that students' unfamiliarity with AI can lead to challenges in integrating these tools into learning environments.[25]

To bridge this gap, several strategies have been proposed such as curriculum enhancement which involves integrating AI-focused courses to provide students with foundational knowledge and practical skills, faculty development which involves training educators to effectively incorporate AI tools into their teaching practices and lastly, workshops and seminars which involves organizing events to raise awareness and improve AI literacy among students.[26]

Despite these initiatives, the persistent gap between perception and practical application indicates a need for more targeted and effective strategies to improve AI knowledge and utilization among University of Benin students.

1.3 JUSTIFICATION FOR THE STUDY

Globally, the integration of artificial intelligence (AI) in higher education is transforming teaching, learning, and administration. According to the Digital Education Council (2024), 86% of students worldwide use AI tools—with nearly 43% of college students in the US relying on these tools (22% for assignment completion).[9] AI-powered chatbots deliver personalized support with 91% accuracy, and studies indicate that AI interventions can boost academic performance by up to 30% and reduce anxiety by 20%.[27]

In Africa, awareness and perception of AI among students are generally low, with inadequate infrastructure and training identified as major barriers[2]. Given the limited data on AI awareness and usage among Nigerian university students and the regional disparities, [17, 18] conducting a study at the University of Benin is essential. This research will offer valuable insights into students' current knowledge, perception, and use of AI within this institution.

Understanding students' perceptions of AI in education is critical, as these views significantly impact learning experiences, technology adoption, and academic success. Studies have highlighted that student attitudes play a pivotal role in the successful implementation of educational technologies.[28]

However, there is a noticeable gap in the literature regarding students' knowledge and perceptions of AI usage, particularly in Nigeria, which has a substantial population of undergraduate students. This study will address this gap by examining the knowledge and perceptions of AI among undergraduate students at the University of Benin.

The integration of AI in education offers numerous benefits that enhance the learning experience, including personalized learning, immediate feedback, improved

collaboration, access to educational resources, intelligent learning analytic, and continuous learning support.[19] This research will provide valuable insights into the current state of AI knowledge, perception, and usage among students in this institution. The findings can inform targeted interventions to enhance AI literacy and integration in the curriculum, ultimately preparing students to effectively engage with AI technologies in their future careers.

By exploring the state of AI knowledge, perception, and usage at the University of Benin, this research will contribute to understanding the barriers and opportunities for AI integration in education. The findings will inform targeted interventions to enhance AI literacy and ensure students are well-prepared to navigate AI-driven professional environment.

1.4 RESEARCH QUESTIONS

1. What is the level of understanding of AI among university of Benin students?

2. What are the perceptions of University of Benin students regarding the potential benefits and drawbacks of AI?

3. What is the extent to which students of University of Benin adopt and utilise AI technologies?

4. What are the factors that influence the knowledge, perception and use of AI?

1.5 AIM AND OBJECTIVES

The aim of this study is to assess the knowledge, perception, and use of Artificial Intelligence (AI) among University of Benin students, with a view to integrate AI into the curriculum.

1. To determine the level of knowledge about AI among University of Benin students.

2. To examine the perception of University of Benin students towards AI.

3. To investigate the extent to which University of Benin students use AI technologies.

4. To identify the factors that influence the knowledge, perception, adoption and use of AI among University of Benin students.

CHAPTER TWO

LITERATURE REVIEW

The integration of Artificial Intelligence (AI) into higher education is transforming teaching and learning by offering personalized experiences, adaptive feedback, and enhanced academic performance. Tools like chatbots, intelligent tutoring systems, and automated grading are widely used to support research, improve engagement, and streamline academic processes. Students generally view AI positively, acknowledging its benefits for accessibility and individualized learning. However, concerns remain about technical reliability, privacy, and ethical issues like authorship and data use.

Factors influencing satisfaction with AI tools include perceived usefulness, ease of use, and system quality. Theoretical models such as Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) help explain students' acceptance and continued use of AI in education. Individual traits like self-efficacy and readiness for self-directed learning also play a role. Regional differences exist in adoption rates, and further research is needed to ensure AI integration aligns with educational goals and sustainability principles.

In today’s rapidly evolving digital era, Artificial Intelligence (AI) has become an integral force shaping society, education, and professional life. AI literacy defined as the ability to understand, evaluate, and effectively engage with AI technologies is now considered a fundamental component of digital competence and media and information literacy (MIL). According to Mansoor et al. (2024), AI literacy has emerged as both a human right and a critical pillar for societal development,

necessitating widespread awareness and competency across all academic disciplines and nations.

AI tools are no longer limited to tech industries—they are actively transforming communication, healthcare, education, and even creative arts. Tools like ChatGPT and Claude facilitate natural language processing, enabling students and professionals to generate content, summarize texts, and engage in interactive learning. In academic research, Elicit helps automate literature reviews, while Scite verifies the credibility of citations. Visual-based tools such as DALL·E and Midjourney generate images from textual prompts, assisting in media production and creative expression. In data analysis, platforms like IBM Watson and Google AutoML empower users to make predictions, detect patterns, and derive insights without needing deep programming knowledge.

Despite the proliferation of these tools, significant disparities exist in students' awareness and usage of AI, as highlighted in both international and national studies. For instance, Hornberger et al. (2023) developed and validated an AI literacy test among German university students, finding that while students with technical backgrounds demonstrated higher literacy, many lacked the foundational understanding necessary to critically engage with AI applications.

This underscores the pressing need to embed AI literacy across educational curricula. As Mansoor et al. (2024) observed in their cross-national study involving students from Egypt, India, Saudi Arabia, and Malaysia, variables such as academic discipline, degree level, and country significantly influence students' perceptions and effective use of AI tools. Therefore, fostering AI literacy through inclusive, interdisciplinary education is vital—not only to empower individuals academically and professionally

but also to ensure ethical and informed participation in a world increasingly shaped by intelligent systems.

2.1 KNOWLEDGE OF ARTIFICIAL INTELLIGENCE AMONG UNIVERSITY STUDENTS

A cross-sectional study was conducted in Germany in 2023 to assess AI literacy among university students using a validated AI knowledge test. A total of 1,286 students were sampled using a random sampling technique, and data were collected through a self-administered web-based multiple-choice AI literacy test. The study involved students from six universities in southern Germany. The study shows that 73.5% of students engaged in informal AI learning less than once a month, indicating limited exposure outside formal education. Only 19.6% of students had taken an AI-related course, suggesting gaps in formal AI education. The findings from the study shows that students with higher self-efficacy and strong interest in AI tended to perform better on the literacy test. However, those from non-technical backgrounds consistently scored lower, indicating a disparity in AI comprehension among disciplines. The strength of the study lies in its large sample size and the use of a validated AI knowledge test students which provides a solid foundation for inference and ensures consistency and accuracy in measuring AI literacy. However, the study did not account for prior AI exposure through work or personal projects, which may impact knowledge levels and it focused on southern German universities, limiting applicability to broader populations.[29]

In a broader effort to understand cross-cultural AI literacy, a multinational cross-sectional survey carried out in 2024 examined university students in Saudi Arabia, Malaysia, India, and Egypt. Spanning ten universities and drawing on responses from 1,800 students selected via stratified random sampling technique, this study assessed

the AI literacy levels among university students and explore the influence of demographic and academic factors on their understanding and use of AI. Data were collected through a self-administered online questionnaire distributed from April 20 to May 20, 2024. Striking differences were observed between countries; Malaysian students emerged as the most AI literate with 68% demonstrating high proficiency while only 35% of Egyptian students met this threshold. Overall, the average AI literacy score across all participants was 2.98 out of 5, reflecting a moderate understanding but clear deficiencies in both practical skills and ethical understanding related to AI. By capturing insights from multiple countries as well as the large sample size of 1,800 respondents, the study offers a valuable comparative lens. It also offers transnational perspective by including diverse educational and cultural setting. The study's limitations include its reliance on self-assessment methods, which may introduce response bias. Additionally, focusing solely on students from four countries limits the generalizability of the findings.[30]

A cross-sectional study was conducted in Sudan in 2024 examined the knowledge, attitudes, and practices related to artificial intelligence (AI) among medical students. Drawing from multiple universities across the country, the study sampled 762 students through a convenience sampling method, with data collected via a self-administered web-based survey distributed through social media platforms such as WhatsApp, Facebook, and Messenger, as well as Email. The findings revealed that while 84.3% of students had a basic understanding of AI, more specific knowledge was lacking. Only 32.7% were familiar with machine learning and deep learning. Moreover 56.7% of respondents were unaware of AI's role in the medical field. Awareness of AI application in radiology (24.4%) and pathology (21.7) was also limited, highlighting significant knowledge gap in medical contexts. Notably, 81.9%

of students had never received formal AI education in medical school, emphasizing a need for structured training within the medical curriculum. The study's sample size of 762 medical students from multiple universities across different regions in Sudan provides a broad representation of medical students in the country. The study addresses a significant gap by exploring AI literacy among medical students in a low resource setting. However, convenience sampling via online platforms may not yield a fully representative sample and a potential redundancies and response biases due to the nature of the self-administered web surveys.[31]

In a 2023 cross-sectional survey conducted at Nnamdi Azikiwe University, Awka, Anambra State, Nigeria, researchers explore knowledge and perception of AI use among undergraduate students. A sample size of 380 undergraduate students was selected using a survey method and data were collected via a self-administered structured questionnaire. The study found that 41% of respondents reported a low level of knowledge about AI, while 32% reported very low knowledge. Only 23% of respondents claimed high or very high knowledge of AI and 4% were undecided. The study provides a focused exploration of undergraduate knowledge to enhance their academics, highlighting areas for improvement. However, the study sample size is limited to a single university which may not be representative of Undergraduate students in other institutions or regions and the use of a convenience sampling method introduce selection bias, as the sample may not truly represent the population.[18]

In a 2025 cross-sectional study conducted in Nigeria in 2025 to investigate the influence of AI on Nigerian students' academic performance in tertiary institutions. The study encompassed a broad spectrum of institutions-universities, polytechnics, monotechnics, and colleges of education across Nigeria and employed a random sampling technique to select a total of 509 students. The data collection process

involved a self-administered online questionnaire, which was distributed through Google Forms, allowing participants to independently complete and submit their responses. Results indicated a high level of AI awareness with 74.3% of students reporting familiarity with AI tools. Students were most familiar with Snapchat AI (38.9%) and ChatGPT (33.4%), suggesting that social media and general-purpose AI tools dominate AI exposure. Notably, 58.5% (298) of students had undergone training in using AI for academic purposes, while 28.1% (144 students) had not received such training. Additionally, 13.25% (67 students) were uncertain about their AI training status. This translates to approximately 6 in 10 Nigerian students having received AI training, 3 in 10 not having received it, and 1 in 10 being unsure. The study also linked AI knowledge to academic benefit finding that students reported various advantage. Some 26.3% (134 students) credited AI with enhancing their knowledge in various subjects, while 24.6% (125 students) reported improved learning skills. Additionally, 19.8% (101 students) found that AI simplified complex aspects of their disciplines and 14.9% (76 students) appreciated AI for facilitating quick understanding of subjects. A smaller percentage, 4.1% (21 students), believed AI improved their language skills. While the study's diverse sample from various tertiary institutions across Nigeria enhances its representativeness of students' experiences with AI, it lacks detail on whether the AI training received by students was formal or informal, which could impact the interpretation of the results. Moreover, the use of an online questionnaire may limit the depth of insight gathered.[32]

2.2 PERCEPTION OF UNIVERSITY STUDENTS TOWARDS AI

A cross-sectional study was conducted in Hong Kong in 2023 to analyze university students' perceptions of generative AI (GenAI) technologies, such as ChatGPT, focusing on their familiarity, willingness to engage, benefits, challenges, and effective

integration. The study targeted 399 undergraduate and postgraduate students from six universities in Hong Kong, representing various disciplines. A total of 399 students were sampled using a convenience sampling technique, and data were collected through a self-administered online structured questionnaire. The survey findings revealed that 66.7% of students had prior experience with AI, and a significant majority (89%) had a positive perception of AI in education, acknowledging its role in assisting with writing, research, and brainstorming. Despite this, only 10% believed AI improved their academic performance, showing skepticism about its effectiveness. Furthermore, 78% of students believe AI-generated work can be identified, raising concerns about its validity in academia. Ethical concerns were also common, with students expressing worries about accuracy (93%), misinformation, and over-reliance on AI for learning tasks. The study's key strength lies in its comprehensive exploration of students' perceptions across multiple dimensions, providing a well-rounded understanding of how generative AI is viewed in the academic contexts. However, the use of convenience sampling and self-reported data may introduce bias and there is limited generalizability due to the study being restricted to Hong Kong universities.[33]

A mixed-method cross-sectional study was conducted at the University of Liverpool, UK, in 2024 to assess student perspectives on Generative AI tools to inform academic integrity policies. The study began with three focused group sessions involving 24 students from various faculties and level of study. Subsequently, a total of 2,555 students participated, sampled using a survey-based approach. The results showed that student perceptions towards Generative AI was largely conditional. While 54.1% were supportive or somewhat supportive of tools like Grammarly for grammar assistance, 70.4% expressed disapproval of using ChatGPT to write entire essays.

Many students emphasized the difference between assistive use and outright substitution of their academic effort. Comments from the survey suggested that generative AI could be useful for summarizing texts, rewording, complex information, or providing quick support, particularly beneficial for international students and those with learning difficulties. Furthermore, 41.1% advocated for a university-wide policy clearly defining AI use boundaries, highlighting a need for clearer institutional guidelines. Some students expressed concerns about fairness in AI accessibility, potential misuse, and academic integrity risks. The study benefits from a large and diverse sample size of 2,555 students, offering rich insights into student views from a single institution. The mixed-methods approach, combining survey and focused group allow for a more comprehensive understanding of student perspectives and experiences with Generative AI tools. However, the study focused on one university, potentially limiting the generalizability of its findings. It also did not explore a wide range of AI tools beyond Grammarly and ChatGPT.[34]

A cross-sectional study conducted in the Kathmandu Valley, Nepal in 2024 to evaluate awareness, perceptions, and competencies of undergraduate students concerning AI. The study involved 123 undergraduate students from various colleges in the Kathmandu Valley. The students were sampled using a structured Likert-scale questionnaire administered both online and in-person. Results showed strong optimism towards AI: 51.2% strongly agreed, and 35% agreed that AI will significantly impact daily life, highlighting a broad recognition of AI's influence. While 66.7% of students believed AI will create job opportunities, 36.9% expressed concerns about job displacement and increasing social isolation. Ethical concerns were notable as 43.9% of students were concerned about privacy risks and algorithmic bias, indicating a need for AI ethics education. Trust in AI-generated

information varied, with 37.4% neutral while 29.3% expressing agreement. While 59% of students agreed that AI could revolutionize life, work, and interactions, only 21.1% strongly believed it would have a long-term positive impact on society. AI exposure influenced perception. Students who had attended AI-related seminars or courses held more positive attitudes toward AI adoption. The study offers valuable insight into how students perceive AI potential and challenges. The study was limited by its sample size and focus on students from a specific region (Kathmandu Valley), which may limit the generalizability of the findings. Potential selection bias due to the reliance on students from urban colleges. Additionally, the use of self-reported data might introduce bias in the responses.[35]

A cross-sectional study was conducted in South Africa, Egypt, Nigeria, and Ethiopia in 2024 to assess the usage, impact, integration, and barriers to accessing publicly available AI tools within higher education in Africa's largest economies. The study targeted university students aged 18-26 across the four countries. A total of 2,883 students were sampled using an online survey method with a structured questionnaire to collect data. The findings revealed varied perception across countries. In Egypt, 50% of students believed that AI tools contributed to a tenfold increase in the productivity, the highest among the countries surveyed. South Africa followed with 32%, while Ethiopia and Nigeria trailed with 25% and 24% respectively. In terms of a fivefold productivity boost, 52% of Nigerian students, reported this level of impact, the highest in that category, followed by Ethiopia at 38%. South Africa and Egypt reported 21% and 38% respectively. For moderate productivity gains (twofold increase), South Africa led with 27%, while Nigeria recorded only 9%. Minimal impact (2-7% improvement) was reported by a small number in each country, while 12% of Nigerian and 10% of Ethiopian students felt AI tools made no difference to

productivity. The study sample size of 2,883 students from four countries (South Africa, Egypt, Nigeria, and Ethiopia) provides a broad representation of university students experiences with AI tools in Africa. It also offers transnational perspective by including diverse educational and cultural setting. The study's limitation includes a focus on economically prominent countries, potentially neglecting perspectives from smaller or less developed African nations. The reliance on self-reported survey data also introduces the possibility of response bias.[36]

A qualitative study was conducted in South Africa in 2024 to explore postgraduate students' perceptions of the benefits of artificial intelligence tools, specifically ChatGPT, in their academic success at historically disadvantaged universities. The study focused on postgraduate students pursuing master's degrees at two historically disadvantaged universities in South Africa. A total of 10 postgraduate students were sampled using a purposive sampling technique, and data were collected through semi-structured interviews. Students perceived ChatGPT as an indispensable tool for refining research topics, paraphrasing text, and enhancing academic writing. Some students relied on ChatGPT to generate ideas for research problem statements, indicating its influence on the early stages of the research process. ChatGPT was seen as a time-saving tool, particularly in conducting literature reviews, helping students find relevant sources more efficiently. Non-native English speakers found ChatGPT helpful in improving their academic writing skills, ensuring grammatical accuracy and coherence. Despite its benefits, students acknowledged concerns about over-reliance, ethical considerations, and the need for policy development on AI use in academia. The qualitative approach allows for a deep understanding of the students' personal experience within their social contexts, and the use of purposive sampling enables the selection of participants who are specifically relevant to the research question,

ensuring the data collected is rich and informative. However, online interviews may have lacked the depth that face-to-face interactions could provide. Findings may be specific to historically disadvantaged universities and not applicable to well-resourced institutions.[7]

A cross-sectional study was conducted in North Central, Nigeria, in 2024 to investigate undergraduate students' awareness, perceptions, and challenges in integrating artificial intelligence (AI) into pedagogical practice. The study targeted undergraduate students from the Faculty of Education at a university in North Central, Nigeria. A total of 421 students were sampled using a multi-stage probability sampling technique, and data were collected through a structured questionnaire. The results showed that 59% of students believed AI could improve personalized learning experiences, while 66% agreed AI could help address learning gaps. 50% of the students expressed interest in using AI-powered tools, although concerns around ethics and privacy remained prominent. Students viewed AI as a valuable addition to traditional teaching methods (2.89 mean score), but there was mild skepticism about its actual impact on academic performance (2.86 mean score). Additional concerns included technical difficulties (2.58 mean score), privacy risks (2.72 mean score), and inadequate training (2.67 mean score). Notably, there was resistance to AI adoption was observed, with students fearing reduced critical thinking skills (2.81 mean score) and loss of human interaction in learning. The study's sample size of 421 students is relatively large, providing a representative sample of undergraduate students from the Faculty of Education and also increases the generalizability of the findings to the broader population of undergraduate students in North Central, Nigeria. The study focused only on education students, limiting generalizability to other disciplines.

Relied on self-reported perceptions, which may introduce bias and did not examine long-term AI adoption trends, missing insights into evolving perceptions over time.[10]

2.3 THE EXTENT TO WHICH UNIVERSITY STUDENTS USE AI TECHNOLOGIES

A cross-sectional study was conducted in 50 countries in 2024 to explore early perceptions and patterns of ChatGPT use in higher education globally. A total of 3,110 university students were sampled with stratified random sampling technique and data was collected through online structured questionnaire. Result from this study showed that 75% of students had used ChatGPT. Major uses included brainstorming, summarization, and content refinement. Students valued its usefulness but raised concerns about accuracy, ethics, and classroom applicability. It reported widespread early adoption of ChatGPT for academic purposes. However, the study also revealed cautious attitudes towards its factual accuracy and limited classroom applicability. Notably, students acknowledged ChatGPT's usefulness in simplifying complex concepts, but expressed concerns about over-reliance and ethical use of such tools. While the sample was diverse and the response rate high, the reliance on self-reported data introduces response bias. Cultural and curriculum-based factors influencing usage were under-explored.[4]

A descriptive cross-sectional study was conducted in Europe in 2023 among 480 Hungarian university students to examine the usage of and attitude of university students towards artificial intelligence. The students were sampled through convenience sampling technique and data was collected through Likert-scale questionnaires. Result from this study showed about 42% of students had used AI tools, but only 15% understood how they function. Lack of AI-related curriculum was

the main barrier. Students used AI mostly for writing assistance and translation. The study also found that while many students had access to AI tools, practical usage remained limited due to low digital literacy and lack of structured AI education. It emphasized the need for institutions to develop curricula integrating AI applications to ensure students not only use these tools but do so critically and ethically. While the study identified barriers clearly, it was limited to one country and lacked qualitative insights into students' learning behaviors.[7]

A qualitative study was conducted in the United States of America in 2023 among undergraduate students to explore awareness, perception, and impact of ChatGPT on learning. A total of 200 undergraduate social science students were sampled using purposive sampling technique and data was collected through semi structured interviews. Result from this study showed that students reported ChatGPT as useful for simplifying topics and generating study materials. However, many were unaware of potential academic integrity issues and over-reliance risks. The study provides rich insights into user experience but was limited by a small, discipline-specific sample.[37]

A cross-sectional study was conducted in the United States of America in 2024 among university students to examine the ethical use of generative AI tools in higher education. A total of 1,042 students were sampled through stratified random sampling technique and data was collected through online surveys. The result showed that 88% of students used AI tools in academic work, with 63% using them weekly. However, 45% were unaware of data privacy implications. Students in engineering and computer science showed higher proficiency. The study showed robust dataset and cross-institutional coverage, but the survey lacked qualitative feedback on user experience.[38]

A descriptive study was conducted in China in 2023 to examine students' perception and use of generative AI tools in higher education. A total of 399 undergraduate and postgraduate students were sampled through convenience sampling method and data was collected through online survey. The results showed that students generally use AI tools for writing, research, and self-study. Common concerns included over-dependence, misinformation, and plagiarism. The study had good breadth but lacks cross-cultural comparison; non-peer-reviewed source limits academic rigor.[39]

A descriptive cross-sectional study was conducted in Malaysia in 2022 to assess students' awareness and usage of AI technologies. A total of 750 undergraduates were sampled with stratified random sampling technique and data was collected using online questionnaires. Result showed that 60% of students reported using AI tools such as chatbots, translators, and content summarizers. AI usage was higher in science and technology faculties. Only 25% had received formal AI training. The study showed strong representation across disciplines and institutions, but lacks qualitative data to contextualize attitudes and barriers.[40]

A descriptive cross-sectional study was conducted in Vietnam in 2022 to evaluate the extent of use of AI technologies among university students. A total of 500 students were sampled using convenience sampling technique and data was collected using online surveys. Result showed 80% had used AI tools such as Google Translate, Grammarly, and ChatGPT. However, only 30% claimed to understand the technical functioning of these tools. Ethical concerns and AI bias were noted. The study provided important statistics but lacked information on curriculum integration or faculty support for AI learning.[41]

A quantitative cross-sectional study was conducted in Mexico in 2023 to access differences in AI tools usage and adoption across various academic fields. A total of 238 students across disciplines were sampled with non-probability sampling technique and data was collected using online questionnaire. Result showed usage of AI tools like ChatGPT and DALL-E was higher among students in architecture and design. Students valued efficiency but lacked training and institutional guidance. The study highlights discipline-specific trends, but self-reported data may be biased. The study also lacks longitudinal insights.[42]

An exploratory cross-sectional study was conducted in Kenya in 2023 to assess the level of AI literacy among university students. A total of 300 students were sampled using stratified sampling techniques employing mixed method data collection method through surveys and interviews. Result showed that 70% of engineering students and only 25% of humanities students used AI tools. Common applications included plagiarism checking, data analysis, and AI-assisted writing. The study showed excellent discipline-based comparison but limited generalizability due to single-institution scope.[43]

A cross-sectional study was conducted in Ghana in 2024 to assess the use of AI for academic writing support among postgraduate students. A total of 339 postgraduate students were sampled using multistage sampling technique and data was collected using online surveys and follow-up interviews. Results showed that 71.1% of postgraduate students used AI tools like Grammarly and ChatGPT to generate or improve academic texts. 58.9% used AI for grammar and spelling correction, 44.2% used AI for paraphrasing or rewording text, and 29.6% relied on AI to generate ideas or outlines for assignment. However, ethical awareness and skills in evaluating AI

outputs were low. The study had strong in depth and triangulation of data sources, but focused only on one level of study (postgraduate).[44]

A descriptive cross-sectional study was conducted in three Southwestern Nigerian universities in 2021 to assess usage of AI tools among students in higher education institutions in Nigeria. A total of 450 students were sampled using random sampling technique and data was collected through structured questionnaire. Result showed that while 57% of students were aware of AI tools, only 21% reported consistent use. Usage was mostly limited to tools like Grammarly and Turnitin for plagiarism check. Barriers included lack of access, insufficient exposure, and poor faculty integration. The sample from multiple institutions enhances representativeness. However, the study lacks an in-depth qualitative dimension to explore students' experiences or challenges in using AI tools.[45]

A descriptive cross-sectional study was conducted across three Federal Universities in Southern Nigeria in 2024 to investigate the AI literacy level and usage among university students in Nigeria. A total of 618 students were sampled using stratified random sampling method and data was collected through online structured questionnaire. Results showed that 71% of students expressed positive perceptions of AI use in academics but only 28% had used AI tools, mostly for writing assistance. Lack of training, inadequate infrastructure, and absence of AI in curriculum hindered broader adoption. The study showed that the large and diverse sample supports broader applicability of findings. However, the exclusive use of online surveys may have excluded students with limited internet access.[46]

A descriptive cross-sectional study was conducted in a tertiary institution in Anambra State, Nigeria in 2025 to examine the level of awareness, perception, and usage of AI

technologies among undergraduate communication students. A total of 322 undergraduate communication students were sampled using purposive sampling techniques and data was collected through structured questionnaires and focus group discussions. The findings showed that only 30% of respondents actively used AI tools for academic purposes. Barriers included poor digital skills, low access to resources, and lack of curriculum integration. The mixed-method approach enriched data interpretation, but the study was restricted to one academic discipline, which limits generalizability across other faculties.[6]

A descriptive cross-sectional study was conducted in the University of Benin, Edo State, Nigeria in 2025 to assess the perception and extent of use of AI tools among undergraduate students. A total of 402 undergraduates were sampled using stratified sampling method and data was collected through paper-based questionnaire. The showed that 65% of students acknowledged that AI could enhance their learning experiences. Despite recognizing benefits like rapid grading and personalized learning, few students had practical experience using AI tools. Concerns included mistrust in AI output, bias, and lack of AI literacy. The institution-specific focus limits national comparability. A follow-up longitudinal or inter-university study would offer stronger insights.[47]

2.4 FACTORS THAT INFLUENCE KNOWLEDGE, PERCEPTION, ADOPTION AND USE OF AI AMONG UNIVERSITY STUDENTS

A cross-sectional study was conducted among five Arab countries (Egypt, Iraq, Jordan, Kuwait, and Lebanon) in 2023 to assess factors affecting university students' attitudes and usage of ChatGPT and validate the Technology Acceptance Model Extension (TAME) for ChatGPT instrument for educational contexts. A total of 2,240 university students were sampled using non-probability (convenience) sampling

technique and data was collected through online self-administered structured questionnaire (TAME-ChatGPT instrument with 25 Likert-scale items). The study showed that Perceived Ease of Use (PEU) and Perceived Usefulness (PU) were significant predictors of ChatGPT adoption. Social influence and attitudes toward technology strongly influenced perception and willingness to use ChatGPT. Behavioral and cognitive factors (e.g., habits, prior experience) had a notable role in increasing adoption rates. Perceived risks and anxiety were inversely related to ChatGPT usage. Students from Egypt and those with lower GPAs reported higher usage. Age negatively correlated with adoption. Private university students were more likely to use ChatGPT than those from public institutions. The large, multinational sample increases regional generalizability. The TAME-ChatGPT instrument showed strong construct validity through confirmatory factor analysis (CFA). It explores a wide range of cognitive, behavioral, and demographic factors. The limitation of the study includes the fact that convenience sampling introduces selection bias and limits the external validity of findings. The cross-sectional design also restricts causal interpretations and ignores temporal trends. Reliance on self-reported usage and perception data could introduce response bias. Cultural and linguistic differences across the sample countries were not deeply analyzed in relation to AI adoption.[48]

A cross-sectional study was conducted in Jordan, Turkey, Canada and USA in 2025 to investigate the technological and socio-environmental factors influencing AI adoption intentions among students and staff in higher education institutions. A total of 367 participants sampled through purposive sampling technique and data was collected through online structured questionnaire. The study showed that the key positive influencers of AI adoption intentions included compatibility, user satisfaction, ease of use, performance expectation, strategic alignment, user interface, technological

support, and facilitating conditions. Demographic variables (such as age, gender, and experience) had moderating effects. Competitive pressure and government regulations showed no significant direct influence. The study had a large sample and global scope which improved generalizability. However, combining students, faculty, and staff in one sample might blur user-specific insights. The non-peer-reviewed nature of the preprint requires cautious interpretation.[49]

A cross-sectional study was conducted in the United Kingdom in 2019 to explore the motivations and factors behind academic outsourcing and its connection to AI use in higher education. A total of 50 students were sampled through purposeful sampling and data was collected through interviews and questionnaires. The study showed that students outsourced assignments due to low motivation and skill; AI tools potentially replaced such outsourcing. The study was not AI-focused but provides indirect insight into AI adoption motivations and factors that influence AI usage.[50]

A cross-sectional study was conducted in China in 2020 to explore the factors affecting teachers' adoption of AI-based educational tools in higher education, using an extended Technology Acceptance Model (TAM). A total of 311 teachers were sampled through purposive sampling (teachers experienced with AI technologies such as Mosoteach and Smart Class) and data was collected through structured questionnaire with 21 items on a 5-point Likert scale, analyzed using Structural Equation Modeling. Self-efficacy had the strongest effect on perceived ease of use, attitude toward use, and indirectly on behavioral intention. Attitude towards use had the most significant total effect (0.793) on behavioral intention. Perceived usefulness and perceived ease of use influenced attitude towards use and behavioral intention but with less direct impact than self-efficacy. Anxiety negatively related to attitude towards use but not significantly predictive on its own. Model fit and reliability of the

structural equation model explained 70.4% of the variance in teachers' behavioral intention to adopt AI. Cronbach's alpha for constructs ranged from 0.699 to 0.925, indicating strong internal reliability. Empirically robust use of Structural Equation Model to test a comprehensive model integrating psychological and perceptual (perceived use and perceived ease of usage) factors. Clear identification of self-efficacy as a crucial enabler of AI adoption among educators, offering a template for institutional training strategies. The study focused solely on teachers, not students, limiting generalizability to the broader academic community. Data were collected from a single national context (China), which may not reflect cross-cultural variations in AI adoption. The cross-sectional design prevents conclusions about long-term behavioral change or sustained use of AI tools.[51]

A cross-sectional study was conducted at King Faisal University, Saudi Arabia in 2024 to investigate the factors influencing students' adoption of ChatGPT for research and its impact on learning satisfaction. A total of 262 universities students (which included both undergraduate and postgraduate students) were sampled through voluntary response sampling technique and data collected through self-administered structured questionnaires. The study showed that interactive learning and collaborative learning were strong predictors of both perceived ease of use and ChatGPT adoption. Students who discussed and collaborated with peers about ChatGPT reported higher comfort levels using it. Perceived ease of use had a significant impact on ChatGPT use, learning motivation, and satisfaction. Perceived usefulness significantly influenced learning satisfaction and motivation but did not significantly predict actual use. High-quality, relevant content from ChatGPT strongly influenced continued usage. In contrast, inaccurate or misleading outputs reduced trust and usage. ChatGPT use was positively associated with increased learning

motivation, which in turn significantly influenced learning satisfaction. Surprisingly, IQ did not significantly impact ChatGPT use, suggesting other variables such as usability and usefulness play stronger roles. Learning satisfaction was most strongly influenced by perceived usefulness, ease of use, and motivation suggesting indirect rather than direct effects of ChatGPT use on satisfaction. The study was able to investigate the factors influenced students' adoption of AI technology for research in higher education but was limited by the fact that it was conducted in a single institution in Saudi Arabia, limiting cross-cultural generalizability, it focused solely on ChatGPT, excluding other AI tools used in academia, it used a cross-sectional design, which limits causal inference and self-reporting may introduce social desirability bias.[52]

A cross-sectional study was conducted in the University of the Witwatersrand, South Africa in 2025 to examine the drivers influencing the use of AI-powered tools in academic research among university students. A total of 271 final-year undergraduate and postgraduate students were sampled using convenience sampling technique and data was collected through structured questionnaire. The study revealed that adoption of AI was strongly influenced by perceived usefulness and ease of use, prior knowledge, and awareness. Trust and self-efficacy moderated the adoption of AI tools. Most-used tools were for summarizing, paraphrasing, and editing research content. The study had focused sample which provided relevant academic context but limited generalizability beyond one institution. There was also strong use of the Technology Acceptance Model (TAM) enriched its theoretical depth.[53]

A descriptive cross-sectional sturdy was conducted among 5 Nigerian Polytechnics to assess the factors influencing the awareness and readiness of polytechnic students toward adopting AI in library operations. The study was conducted among 385 final-

year students (from 5 Nigerian polytechnics) were sampled the purposive sampling technique and data was collected through structured questionnaire. Influencing factors were ranked using Unified Theory of Acceptance and Use of Technology (UTAUT) constructs: Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions and major challenge was unstable power supply (34%). The study provides robust empirical data using UTAUT and large sample enhances reliability but was limited to polytechnic students; results may not generalize to university students.[54]

A descriptive cross-sectional study was conducted in Cross River, Nigeria in 2023 to examine factors influencing AI utilization in science teaching using the Technology Acceptance Model (TAM). The study was conducted among 79 science teachers (not university students, but relevant for African educational context) were sampled through simple random sampling technique and data was collected through structured questionnaire. The result showed that the teachers demonstrated high approval for AI use (mean score: 3.00/4). Self-esteem, perceived ease of use, and perceived benefits significantly influenced behavioral intention. Sex, age, and residence location had no significant influence. While informative, the study's sample was limited to science teachers in secondary education, not university students. Thus, generalization to university populations must be done cautiously.[55]

A qualitative case study was conducted among 4 universities in Jigawa State, Nigeria in 2024 to examine the factors influencing the adoption and use of AI in teaching and learning. A total of 12 academic staff were sampled using purposive sampling technique and data was collected through semi-structured interviews. Participants reported that AI tools saved time and enhanced teaching efficiency. Factors influencing adoption included performance expectancy, effort expectancy, social

influence, and facilitating conditions. Some participants raised concerns about content accuracy and lack of technical infrastructure. The study rich qualitative insights but small sample limits generalizability. It was also focused on staff, not students, but provides institutional context for factors influencing AI use.[56]

A cross-sectional study was conducted in Bayelsa State, Nigeria in to assess factors influencing the utilization of AI tools by computer science students. A total of 263 students were sampled through census of all enrolled students and data was collected through structured questionnaire. The study revealed that AI tools like ChatGPT were widely used. Usage was influenced by institutional support, technological infrastructure, and digital literacy. Key barriers included lack of training and poor internet access. The study had strong context-specific insights, but limited generalizability beyond computer science students.[57]

A systematic content analysis of 25 articles from developed and developing nations was conducted in 2024 to examine global challenges, influences and opportunities for AI adoption in academic libraries. 25 articles were sampled through purposive selection of peer-reviewed articles and data was collected through literature review. The study reported that the key barriers in Nigeria include limited AI expertise, inadequate funding, poor infrastructure, and ethical concerns. Nigerian academic libraries face similar challenges as other developing nations in AI adoption. The study provides comparative perspective between Nigeria and global contexts. It focuses on academic libraries; findings relevant to university services but not student-specific.[58]

CHAPTER THREE

METHODOLOGY

3.1 STUDY AREA

This study was conducted in University of Benin (UNIBEN) located in Benin City, Edo State, Nigeria. It is located in the South-South geopolitical zone of the country. Edo state is bounded in the North by Kogi State, in the West by Ondo State, in the South by Delta state and in the East by Anambra state. It has a landmass of 19,794 square kilometers and lies between latitudes 05' 44" N and 07' 34" N and between longitudes 05' 04' E and 06' 45'E.[59]

University of Benin is located in Ovia North-East Local Government Area of the State, which is one of the eighteen (18) local government areas in Edo State. It was established on the 23rd of November, 1970 by Colonel Samuel Osaigbovo Ogbemudia who led the military administration of Midwest State. The University was established first as Midwest Institute of Technology. After attaining the status of a full-fledged university in line with the requirements of the National Universities Commission on the 1st of July 1971, the name was changed to the University of Benin and the Institution became a federal government owned University on the 1st of April, 1975. The University which currently has two campuses: Ugbowo and Ekenwan campuses initially commenced academic activities at the site of the Old Teachers' Training College on Ekehuan Road (which is now one of the campuses of the University) with 109 students, it now has an estimated 60,000 students' population who are spread across the two campuses of the University. The University has a student enrolment of 38,309 full-time students and 4,000 – 4,499 academic staff with

15 Faculties, 2 Colleges and 3 Institutes. The faculties in UNIBEN include Agriculture, Arts, Education, Engineering, Environmental Sciences, Humanities, Life Sciences, Management Sciences, Pharmacy, Physical Sciences, Social Sciences, Veterinary Medicine and a College of Medical Sciences composed of the Schools of Medicine, Dentistry, Basic Medical Sciences and Institute of Child Health. The university has garnered national, regional, and international acclaim for its pioneering achievements, including being Nigeria's first university to develop indigenous software for Computer-Based Testing (CBT).[60]

UNIBEN is invested in AI, offering a range of opportunities for academic exploration and hands-on involvement. In the Department of Computer Science, students can engage with specialized courses such as Artificial Intelligence (CSC839) and Expert System (CSC842) within its post-graduate programme while undergraduate students in Library and Information Science also take a course on introduction to AI.[61] The University's Directorate of Research, Innovation and Development (DRID) currently offers internship programs which include AI & Machine Learning Engineering that features Natural Language processing(NLP), AI-powered recommendations, and deep learning that provides them with practical experience and exposure to real-world AI challenges.[62] UNIBEN has also established strategic collaborations, notably with the OpenBinacle Group, to advance research in AI and machine translation, with a particular emphasis on indigenous languages.[63] The presence of the AI Development Centre (CAID) further underscores the university's commitment to AI development and application.[64]

3.2 STUDY DESIGN

A descriptive cross-sectional study design was used to determine the knowledge, perception and use of AI among students of UNIBEN.

3.3 STUDY POPULATION

The study population included undergraduate students of the University of Benin, Benin City Edo State.

3.4 SELECTION CRITERIA

3.4.1 Inclusion Criteria

1. Full time undergraduate students of UNIBEN
2. Students of UNIBEN present at the time of data collection.
3. Students who gave consent for the study

3.4.2 Exclusion Criteria

1. Students with impaired cognitive function

3.5 DURATION OF STUDY

The study was carried out from February 2025 to April 2026.

3.6 SAMPLE SIZE DETERMINATION

The minimum sample size (n) was calculated using the Cochran's formula used for descriptive studies.

$$n = \frac{z^2 pq}{d^2}$$

Where:

n = minimum sample size.

z = normal standard deviation (1.96 at 95% confidence interval)

p = proportion of students with very good perception of the use of AI in Nnamdi Azikwe University, Anambra State, Nigeria = 39%.[18]

p = 0.39

q = 0.39 – 1

q = 0.39 – 1 = 0.61

d = degree of precision set at 0.05

n = 365.56

To account for non-response, 10% non-response rate was added to the minimum sample size, utilizing the formula for non-response rate.

ns = adjusted sample size

ns = calculated sample size + non-response rate

nr = non-response rate = 10% = 0.1

nr = 0.1x 365.56 = 36.56

n = calculated sample size = 365.56

ns = 365.56 + 36.56 = 402.12

using a design effect of 1.5

ns = 402.15 x 1.5

ns = 603

3.7 SAMPLING TECHNIQUE

This study utilized a multistage random sampling technique to ensure balanced and representative inclusion of undergraduate students across academic disciplines in the university.

Stage 1: Selection of faculties

Step 1: Stratification of academic faculties by thematic relevance

To account for disciplinary variation in AI relevance and exposure, all faculties were first stratified into three thematic groups, each reflecting a unique interaction with AI technologies:

I. **Science, Technology, Engineering, Mathematics (STEM) Faculties (Excluding Health Sciences):**

This stratum includes disciplines focused on computation, data science, and innovation, that are primary drivers and adopters of AI. Faculties under this group include Engineering, Physical Sciences, Life Sciences, Environmental Sciences, and Agriculture.

II. **Health Sciences Faculties:**

These faculties represent domains where AI is being actively integrated into diagnostics, medical imaging, treatment planning, predictive analytics, and health systems. The stratum includes Medicine, Pharmacy, Basic Medical Sciences, Dentistry, and Veterinary Medicine.

III. Social Sciences, Humanities, and Management Faculties:

This group captures fields involved in exploring the broader societal, ethical, legal, psychological, and economic implications of AI. Disciplines include Arts, Law, Social Sciences, Education, and Management Sciences.

Step 2: Selection of faculties within each stratum

In order to maintain feasibility and resource efficiency, two faculties were selected from each of the three thematic strata through simple random sampling using a balloting method. The selected faculties were:

STEM: Physical Sciences, Life Sciences

Health Sciences: Medicine, Pharmacy

Social Sciences/Humanities/Management: Arts, Management Sciences

This deliberate reduction allowed for manageability of the sample while preserving the principle of stratification.

Step 3: Proportional allocation by faculty

Following faculty selection, a proportional allocation strategy was employed based on the total student population in each faculty. This ensures that each faculty's contribution to the overall sample reflects its actual proportion within the total student body.

Table 1: Proportional allocation of sample by faculty

Faculties	Student population	Percentage of total sample %	Sample size
Arts	10000	45.13	272
Life science	4700	21.21	127
Management science	1970	8.89	54
Medicine	1346	6.07	36
Pharmacy	1200	5.41	32
Physical science	2940	13.26	82
Total	**22, 156**	**100%**	**603**

Stage 2: Selection of departments

Within each selected faculty, two departments were chosen using simple random sampling. A simple random sampling by balloting method was employed to randomly select two departments per faculty, with each department having an equal chance of being chosen. However, in the Faculty of Medicine and Faculty of Pharmacy, all undergraduate students are enrolled under a single department. Therefore, the Department of Medicine and Department of Pharmacy were included directly without additional random selection.

The departments selected through this process are as follows:

Faculty of Arts: International Studies and Diplomacy (ISD), and History

Faculty of Management Sciences: Accounting, and Actuarial Science

Faculty of Physical Sciences: Chemistry, and Computer Science

Faculty of Life Sciences: Animal and Environmental Biology (AEB), and Optometry

Faculty of Medicine: Department of Medicine

Faculty of Pharmacy: Department of Pharmacy

Stage 3: Selection of respondents

The sample of undergraduate students was allocated first by department and then by the academic level using a random sampling approach by balloting. To begin, the total number of students allocated to each faculty was divided equally among its selected departments, so that each department received an identical share of that faculty's sample.

Next, within each department, that departmental share was further divided equally across all academic levels (for example, 100-level through 600-level), creating level-specific quotas.

For each level quota, the required number of students was selected by simple random sampling technique.

Table 2: Departmental and level-based allocation of respondents

Faculty	**Department**	**Faculty sample size**	**Number of departments**	**Sample per department**	**Number of levels**	**Sample per level**
Arts	ISD	272	2	136	4	34
	History			136	4	34
Life sciences	AEB	127	2	64	4	16
	Optometry			63	6	10
Management Sciences	Accounting	54	2	27	4	7
	Actuarial Science			27	4	7
Medicine	Medicine	36	1	36	6	6
Pharmacy	Pharmacy	32	1	32	6	5
Physical Sciences	Chemistry	82	2	41	4	10
	Computer Science			41	4	10

3.8 DATA MANAGEMENT

3.8.1 METHOD OF DATA COLLECTION

Data was collected using a self-administered questionnaire (Google Form), which was sent to selected UNIBEN students via platforms such as Whatsapp, Snapchat, and so on. It was a structured, self-administered questionnaire with close ended and open-ended questions that seek to answer the study objectives.

The questions were divided into 5 sections as follows:

Section A: Sociodemographic data which obtained information on the respondents such as age, sex, tribe, religion, faculty, department, level and socioeconomic status. The tribe was then recategorized into Edo and Non-Edo indigenes in the bivariate and multivariate tables. The Edo indigenes include Benin, Esan, and Afemai while the Non-Edo tribes include Igbo, Yoruba, Hausa, Ika, Itsekiri, Efik, Ibibio, Igala, Ijaw, Isoko, Kalabari, Kwak, and Tiv

Section B: Knowledge of AI among UNIBEN students. Knowledge domains were divided into foundational knowledge of AI, application knowledge of AI, technical knowledge of AI and knowledge about AI ethics.

Section C: Perception of UNIBEN students regarding the potential benefits and drawback of AI.

Section D: The extent to which students of UNIBEN adopt and use AI Technologies

Section E: The factors that influence knowledge, perception and use of AI among UNIBEN students

3.8.2 PRETESTING

The questionnaire was pretested among students at Benson Idahosa University, Benin City, which has a similar study population. To ensure standardization of the questionnaire, it was pretested using 61 questionnaire which is 10% of the initial sample size (603). Appropriate corrections were made to the questionnaire where applicable before commencement of the final survey. Informed consent was obtained from the respondents and they were assured of confidentiality.

3.8.3 METHOD OF DATA ANALYSIS

The filled questionnaires were thoroughly checked for any inconsistency. Data were cleaned and entered into IBM Statistical Package for Social Sciences (IBM – SPSS) Statistics software version 27. Univariate analyses on categorical and numerical data were done and expressed as frequencies, percentages, and mean (standard deviation). Bivariate analysis using Chi- square test and Fisher's exact was done to analyse factors associated with knowledge, perception and use of AI. Multivariate analysis was also carried out to further determine the significant predictors of variables. A p-value of < 0.05, confidence interval of 95% was used. Prose, tables and charts was used in the presentation of data. Data were categorized and analyzed using descriptive statistics, frequencies and percentage based on the total number of respondents.

3.8.4 MEASUREMENT OF VARIABLES AND SCORING

Knowledge of AI

There are 13 questions in total. Each correct response was awarded a score of 1 while incorrect answers received a score of 0, making the maximum possible score 13 and

the minimum score 0. The total scores was converted to percentages and grouped as follows:

Poor knowledge: 0 – 59.9%

Good knowledge: 60 – 100%

Perception of AI

There are 10 Likert-scale items, points are allocated to each as follows: Strongly Agree (SA) = 5, Agree (A) = 4, Neutral (N) = 3, Disagree (D) = 2 and Strongly Disagree (SD) = 1

The maximum cumulative points possible for all 10 items was 50. The final calculated score was then interpreted as a percentage of the total cumulative score using the following formula:

Final score (%) = (Cumulative points / Maximum possible points) * 100

The final score was interpreted as follows:

- ≥ 70%: Positive perceptions
- < 70%: Negative perceptions

The extent to which students of UNIBEN adopt and use AI technologies

There are 9 Likert-scale items, points are allocated to each as follows:

Always = 5, Often = 4, Sometimes = 3, Rarely = 2 and Never = 1

The maximum cumulative points possible for all 9 items was 45. The final calculated score is then interpreted as a percentage of the total cumulative score using the

following formula:

Final score (%) = (Cumulative points / Maximum possible points) * 100

The final score was interpreted as follows:

- ≥ 75%: High AI usage
- 50-74%: Moderate AI usage
- < 50%: Low AI usage

The factors that influence knowledge, and use of AI among UNIBEN students

This section explored factors influencing AI knowledge, and usage through a combination of binary yes/no questions and open-ended questions. For the factors affecting knowledge and use respondents answer five and four yes/no questions respectively. Additionally, a single open-ended question for each aspect, invited respondents to identify their major influencing factor.

3.9 ETHICAL CONSIDERATION

Ethical approval and permission to carry out the study was obtained from the Ethics and Research Committee of the University of Benin Teaching Hospital. Informed consent was taken from the respondents before administering the questionnaires. The respondents were also informed of their right to withdraw without any penalty.

3.10 LIMITATIONS OF STUDY

i. This study relied on information provided by the respondents and may be limited by recall bias.
ii. AI is rapidly evolving field, and findings may become quickly outdated
iii. Certain respondents were unwilling to disclose information regarding their

monthly allowance, they were encouraged to give a range of the amount.

3.11 BENEFITS OF STUDY

i. This study identified the gaps in AI understanding and awareness among students.

ii. This study also identified ways to integrate AI into university curricula and research.

iii. It aimed to provide insights for policymakers to develop informed strategies for AI adoption and integration.

iv. It helped in contributing to the growing body of research on AI adoption and use in higher education.

CHAPTER FOUR

RESULTS

A total of 603 respondents participated in the study and the response rate was 100%. The results are presented in the following sections in line with the specific objectives.

SECTION A: Sociodemographic characteristics of respondents

SECTION B: Knowledge of artificial intelligence among respondents

SECTION C: Perception of artificial intelligence among respondents

SECTION D: Use of artificial intelligence among respondents

SECTION E: Factors influencing knowledge, perception and use of AI among respondents

SECTION A

SOCIODEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Table 1: Sociodemographic characteristics of respondents		
Variables	**Frequency (n = 603)**	**Percent**
Age group (years)		
< 20	310	51.4
20 – 24	255	42.3
> 25	38	6.3
Mean ± SD Age (years)	19.9 ± 2.87	
Sex		
Male	248	41.1
Female	355	58.9
Religion		
Christianity	547	90.7
Islam	48	8.0
African Traditional Religion	4	0.7
Others*	4	0.7
Ethnic groups		
Benin	205	34.0
Esan	109	18.1
Igbo	95	15.8
Afemai	72	11.9
Yoruba	54	9.0
Urhobo	22	3.6
Hausa	11	1.8
Ika	7	1.2
Itsekiri	7	1.2
Efik	5	0.8
Others**	16	2.7
Faculty		
Arts	272	45.1
Life Sciences	127	21.1
Physical sciences	82	13.6
Management sciences	54	9.0
Medicine	36	6.0
Pharmacy	32	5.3
Department		
History	136	22.6
ISD	136	22.6
AEB	64	10.6
Optometry	63	10.4
Chemistry	41	6.8
Computer science	41	6.8
Medicine	36	6.0
Pharmacy	32	5.3
Accounting	27	4.5
Actuarial science	27	4.5
Residence		
Off-campus	355	58.9
On-campus		

Agnostic, Hecate devotee, Hinduism, and Non-religious; **Ibibio, Igala, Ijaw, Isoko, Tiv, Kalabari, Kwak.

The mean age of respondents was 19.9 ± 2.87 years. More than half of the participants were aged less than 20 years, 310 (51.4%), followed by those aged 20–24 years, 255 (42.3%), while a small proportion were older than 25 years, 38 (6.3%). Females constituted the majority of respondents, 355 (58.9%), while males accounted for 248 (41.1%). The majority of respondents identified as Christian, 547 (90.7%), with smaller proportions identifying as Muslim, 48 (8.0%), African Traditional Religion adherents, 4 (0.7%), and other religions, 4 (0.7%) including agnostic, Hecate devotee, Hinduism, and non-religious.

In terms of ethnicity, the largest group was Benin, 205 (34.0%), followed by Esan, 109 (18.1%), and Igbo, 95 (15.8%). Other represented ethnic groups included Afemai, 72 (11.9%), Yoruba, 54 (9.0%), Urhobo, 22 (3.6%), Hausa, 11 (1.8%), Ika, 7 (1.2%), Itsekiri, 7 (1.2%), Efik, 5 (0.8%), and various others, 16 (2.7%).

By faculty, most respondents were from Arts, 272 (45.1%), followed by Life Sciences, 127 (21.1%), and Physical Sciences, 82 (13.6%), while fewer were from Management Sciences, 54 (9.0%), Medicine, 36 (6.0%), and Pharmacy, 32 (5.3%). At the departmental level, History and ISD had the highest representation with 136 (22.6%) each. Other departments contributing smaller proportions included AEB, 64 (10.6%), Optometry, 63 (10.4%), Chemistry, 41 (6.8%), Computer Science, 41 (6.8%), Medicine, 36 (6.0%), Pharmacy, 32 (5.3%), Accounting, 27 (4.5%), and Actuarial Science, 27 (4.5%).

Regarding residency, more than half of the respondents lived off-campus, 355 (58.9%), while 248 (41.1%) resided on-campus.

Table 2: Socioeconomic status of respondents

Variables	Frequency (n = 603)	Percent
Academic level		
100	142	23.5
200	139	23.1
300	141	23.4
400	139	23.1
500	21	3.5
600	21	3.5
Devices owned*		
Smartphone	566	68.9
Laptop	201	24.5
Tablet	45	5.5
Desktop computer	9	1.1
Internet access		
Excellent	185	30.7
Good	309	51.2
Fair	95	15.8
Poor	13	2.2
No access	1	0.2
Monthly allowance (₦)		
<70,000	478	79.3
≥ 70,000	125	20.7
Mean ± SD	61,562.35 ± 103,848.728	
Monthly data expenditure (₦)		
≤ 2,000	101	16.7
2,001 – 5,000	211	35.0
5,001 – 10,000	154	25.5
> 10,000	137	22.7
Mean ± SD	9,515.77 ± 11,206.25	
Disabilities/learning challenges		
Yes	28	4.6
No	575	95.4

Multiple response question

Academic levels were fairly evenly distributed from 100 to 400 level, with 100 level accounting for 142 (23.5%), 200 level for 139 (23.1%), 300 level for 141 (23.4%), and 400 level for 139 (23.1%), while only small proportions were in 500 level, 21 (3.5%), and 600 level, 21 (3.5%).

For device ownership, smartphones were the most prevalent among respondents, 566 (68.9%), followed by laptops, 201 (24.5%), tablets, 45 (5.5%), and desktop computers, 9 (1.1%). Regarding internet connectivity, more than half of the participants described their access as good, 309 (51.2%), while others rated it as excellent, 185 (30.7%), fair, 95 (15.8%), or poor, 13 (2.2%), with only a single respondent reporting no access at all, 1 (0.2%).

The mean monthly allowance was ₦61,562.35 ± 103,848.73$. A total of 478 (79.3) earned less than ₦70,000, while 125 (20.7) earned ₦70,000 or more. Monthly data expenditure followed a similar distribution, with the largest proportion spending between ₦2,001 and ₦5,000, 211 (35.0%), followed by ₦5,001 to ₦10,000, 154 (25.5%), more than ₦10,000, 137 (22.7%), and less than ₦2,000, 101 (16.7%), resulting in a mean expenditure of $₦9,515.77 \pm 11,206.25$. Finally, the majority of respondents reported having no disabilities or learning challenges, 575 (95.4%), while 28 (4.6%) indicated that they did.

SECTION B

KNOWLEDGE OF ARTIFICIAL INTELLIGENCE AMONG RESPONDENTS

Table 3a: Knowledge of artificial intelligence among respondents

Knowledge domains	Frequency (n = 603)	Percent
Foundational knowledge		
Meaning of artificial intelligence		
Machines that perform tasks requiring human intelligence	389	64.5
Machines that perform repetitive mechanical tasks	109	18.1
Machines that can only store large amounts of data	75	12.4
I don't know	30	5.0
Source of information about AI*		
Media	331	39.5
University courses	215	25.6
Friends/family	152	18.1
AI-powered tools	141	16.8
AI connectivity		
Can function both online and offline depending on their design	252	41.8
Can only operate with human supervision	227	37.6
Cannot function without cloud computing	88	14.6
Only works on mobile devices	36	6.0
Application knowledge		
Example of AI in use		
Voice assistants (e.g. Siri and Alexa)	497	82.4
Remote control	93	15.4
Wall clock	12	2.0
Printed map	1	0.2
Function of AI in universities		
Used for both teaching and administrative purposes	435	72.1
AI is not used in any university functions	74	12.3
AI is banned in education	65	10.8
Used exclusively for grading exams	29	4.8
Use of AI in healthcare diagnostics		
To detect diseases in medical images	431	71.5
To replace doctors in all functions	105	17.4
To prescribe medication without supervision	43	7.1
To organize hospital furniture	24	4.0
Relevance of AI to students		
Can be relevant to students in all fields of study	462	76.6
Has no application in the arts or humanities	73	12.1
Only computer science students benefit from AI	48	8.0
AI is only taught in postgraduate courses	20	3.3

Multiple response question

Regarding foundational knowledge, a majority of respondents correctly identified the meaning of artificial intelligence as machines that perform tasks requiring human

intelligence, 389 (64.5%), while others viewed them as machines for repetitive mechanical tasks, 109 (18.1%), or data storage tools, 75 (12.4%), and 30 (5.0%) reported they did not know. The primary sources of information about AI included the media, 331 (39.5%), university courses, 215 (25.6%), friends or family, 152 (18.1%), and direct use of AI-powered tools, 141 (16.8%). In terms of AI connectivity, 252 (41.8%) understood that AI can function both online and offline depending on design, though 227 (37.6%) believed it requires constant human supervision, 88 (14.6%) thought it relies exclusively on cloud computing, and 36 (6.0%) believed it only works on mobile devices.

In the area of application knowledge, voice assistants such as Siri and Alexa were the most recognized examples of AI in use, 497 (82.4%), followed by remote controls, 93 (15.4%), wall clocks, 12 (2.0%), and printed maps, 1 (0.2%). When considering the function of AI in universities, 435 (72.1%) respondents recognized its use for both teaching and administrative purposes; however, smaller proportions believed AI is not used in university functions, 74 (12.3%), that it is banned in education, 65 (10.8%), or that it is used exclusively for grading, 29 (4.8%).

Knowledge of AI in healthcare diagnostics was high, with 431 (71.5%) identifying its use in detecting diseases in medical images, though some believed it replaces doctors entirely, 105 (17.4%), prescribes medication without supervision, 43 (7.1%), or organizes hospital furniture, 24 (4.0%). Finally, most participants agreed that AI is relevant to students in all fields of study, 462 (76.6%), while a minority believed it has no application in the arts or humanities, 73 (12.1%), benefits only computer science students, 48 (8.0%), or is only taught in postgraduate courses, 20 (3.3%).

Table 3b: Knowledge of artificial intelligence among respondents

Knowledge domains	Frequency (n = 603)	Percent
Technical knowledge		
Commonly used programming language in AI		
Python	243	40.3
HTML	132	21.9
JavaScript	94	15.6
Excel	75	12.4
Word	59	9.8
AI performance		
Can be improved performance through additional learning	423	70.1
Must be reprogrammed after every task	88	14.6
Never improves after initial training	55	9.1
AI systems degrade over time	37	6.1
Algorithm in the context of AI		
A set of instructions to solve problems	265	43.9
A method of encryption	170	28.2
A set of ethical rules	108	17.9
A type of hardware	60	10.0
Neural networks in AI		
Are replicative of the way human brains process information	440	73.0
Are replicative of human movement	84	13.9
Are replicative of the human eye	41	6.8
Are replicative of the digestive system	38	6.3
Best description of AI objectivity		
It is programmed to be neutral at all times	260	43.1
It may reflect the biases in the data or design	179	29.7
It is always fair and unbiased	104	17.2
It cannot make mistakes	60	10.0
True about AI regulation		
Governments and organizations are working on AI regulation	325	53.9
Only private companies regulate AI	110	18.2
AI is unregulated and cannot be controlled	88	14.6
AI regulation is unnecessary	80	13.3

In the domain of technical knowledge, Python was identified as the most commonly used programming language in AI by 243 (40.3%) respondents, followed by HTML,

132 (21.9%), JavaScript, 94 (15.6%), Excel, 75 (12.4%), and Word, 59 (9.8%). Regarding AI performance, majority recognized that performance can be improved through additional learning, 423 (70.1%), whereas others believed AI must be reprogrammed after every task, 88 (14.6%), never improves after initial training, 55 (9.1%), or that systems degrade over time, 37 (6.1%). When defining an algorithm in the context of AI, 265 (43.9%) correctly identified it as a set of instructions to solve problems, while others viewed it as a method of encryption, 170 (28.2%), a set of ethical rules, 108 (17.9%), or a type of hardware, 60 (10.0%).

Neural networks were correctly understood by 440 (73.0%) of participants as being replicative of the way human brains process information, though some incorrectly associated them with human movement, 84 (13.9%), the human eye, 41 (6.8%), or the digestive system, 38 (6.3%). In terms of AI objectivity, 260 (43.1%) respondents believed AI is programmed to be neutral at all times, 179 (29.7%) correctly noted that it may reflect biases in data or design, 104 (17.2%) felt it is always fair and unbiased, and 60 (10.0%) believed it cannot make mistakes. Finally, regarding AI regulation, more than half of the respondents, 325 (53.9%), acknowledged that governments and organizations are working on regulations, while smaller proportions believed only private companies regulate AI, 110 (18.2%), that AI is unregulated and uncontrollable, 88 (14.6%), or that regulation is unnecessary, 80 (13.3%).

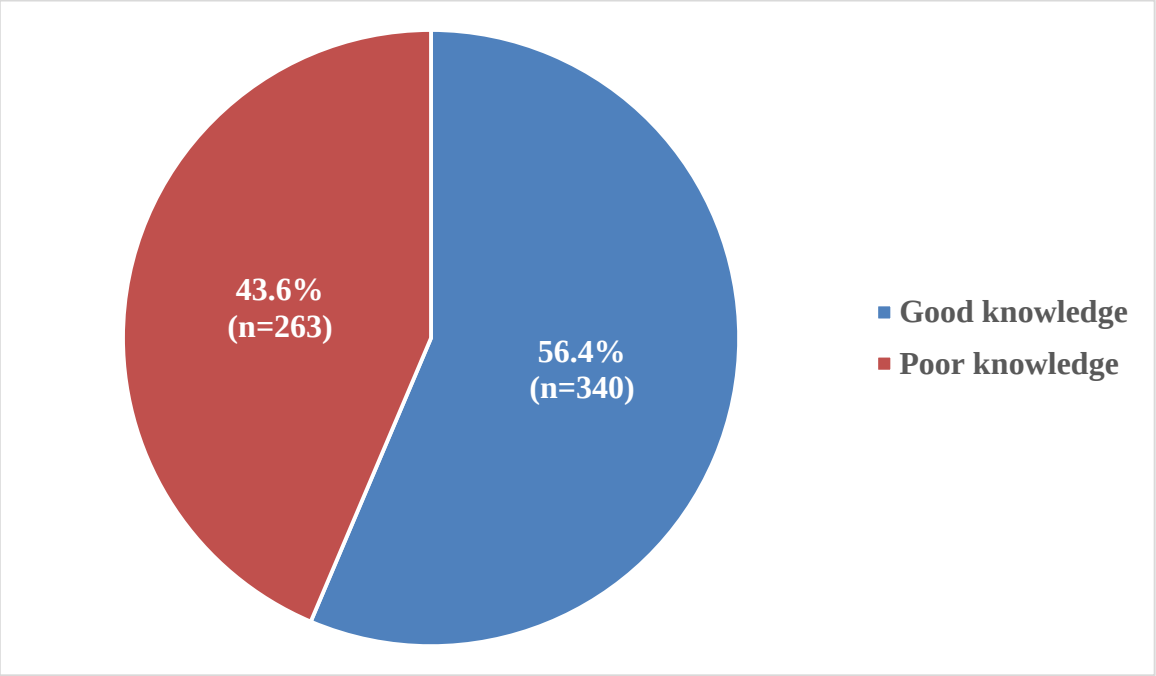

Figure 1: Respondents' overall knowledge of artificial intelligence

Overall, a majority of the respondents demonstrated a good level of knowledge regarding artificial intelligence, 340 (56.4%), while a smaller proportion of the sample, 263 (43.6%), was found to have poor knowledge.

Table 4a: Association between respondents' sociodemographic characteristics and knowledge of AI

Variables	Knowledge		Test statistic	p-value
	Good (n=340) Freq. (%)	Poor (n=263) Freq. (%)		
Age group (years)				
< 20	183 (59.0)	127 (41.0)	χ^2=1.818	0.189
≥ 20	157 (53.6)	136 (46.4)		
Sex				
Male	121 (48.8)	127 (51.2)	χ^2=9.879	**0.002***
Female	219 (61.7)	136 (38.3)		
Ethnicity				
Edo non-indigenes	126 (58.1)	91 (41.9)	χ^2=0.389	0.550
Edo indigenes	214 (55.4)	172 (44.6)		
Religion				
Christianity	310 (56.7)	237 (43.3)	0.343+	0.846
Islam	26 (54.2)	22 (45.8)		
Others**	4 (50.0)	4 (50.0)		
Faculty				
Arts	138 (50.7)	134 (49.3)	χ^2=36.583	**<0.001***
Life Sciences	81 (63.8)	46 (36.2)		
Physical sciences	51 (62.2)	31 (37.8)		
Management sciences	21 (38.9)	33 (61.1)		
Medicine	34 (94.4)	2 (5.6)		
Pharmacy	15 (46.9)	17 (53.1)		
Department				
History	65 (47.8)	71 (52.2)	χ^2=39.960	**0.001***
ISD	73 (53.7)	63 (46.3)		
AEB	44 (68.8)	20 (31.3)		
Optometry	37 (58.7)	26 (41.3)		
Chemistry	24 (58.5)	17 (41.5)		
Computer science	27 (65.9)	14 (34.1)		
Medicine	34 (94.4)	2 (5.6)		
Pharmacy	15 (46.9)	17 (53.1)		
Accounting	12 (44.4)	15 (55.6)		
Actuarial science	9 (33.3)	18 (66.7)		
Academic level				
100 – 300 level	222 (52.6)	200 (47.4)	χ^2=8.160	**0.005***
400 – 600 level	118 (65.2)	63 (34.8)		

Statistically significant; +Fisher's Exact Test **African Traditional Religion, Agnostic, Hecate devotee, Hinduism, and Non-religious.

Age group did not show a statistically significant relationship (p=0.350); however, good knowledge was observed in 183 (59.0%) of those aged <20 years, 135 (52.9%) of those aged 20–24 years, and 22 (57.9%) of those aged ≥ 25 years. Sex was significantly associated with AI knowledge (p=0.002), with a higher proportion of females demonstrating good knowledge, 219 (61.7%), compared to males, 121 (48.8%). Conversely, no significant associations were found for ethnicity (p=0.550) or religion (p=0.846), though the majority of Christian, 310 (56.7%), and Muslim respondents, 26 (54.2%), displayed good knowledge.

Faculty of study showed a highly significant association with AI knowledge (p<0.001), with the highest level of good knowledge found in Medicine, 34 (94.4%), followed by Life Sciences, 81 (63.8%), and Physical Sciences, 51 (62.2%), while lower proportions were noted in Pharmacy, 15 (46.9%), and Management Sciences, 21 (38.9%). At the departmental level, significant differences were also observed (p=0.001), ranging from 34 (94.4%) with good knowledge in Medicine to 9 (33.3%) in Actuarial Science.

While academic level was statistically significant (p=0.005), with those in 400 – 600, 118 (65.2%) level having better knowledge than those in 100 – 300 level 222 (52.6%).

Table 4b: Association between respondents' socio-economic status and knowledge of AI

Variables	Knowledge		Test statistic	p-value
	Good (n=340) Freq. (%)	Poor (n=263) Freq. (%)		
Residence				
Off-campus	187 (52.7)	168 (47.3)	χ^2=4.828	**0.030***
On-campus	153 (61.7)	95 (38.3)		
Internet access				
Excellent	116 (62.7)	69 (37.3)	χ^2=6.529	0.137
Good	168 (54.4)	141 (45.6)		
Fair	50 (52.6)	45 (47.4)		
Poor	5 (38.5)	8 (61.5)		
No access	1 (100.0)	0 (0.0)		
Monthly allowance (₦)				
<70,000	265 (55.4)	213 (44.6)	χ^2=0.838	0.365
≥ 70,000	75 (60.0)	50 (40.0)		
Monthly data expenditure				
≤ 2,000	62 (61.4)	39 (38.6)	χ^2=2.451	0.486
2,001 – 5,000	122 (57.8)	89 (42.2)		
5,001 – 10,000	85 (55.2)	69 (44.8)		
> 10,000	71 (51.8)	66 (48.2)		
Disabilities/learning challenges				
Yes	14 (50.0)	14 (50.0)	χ^2=0.487	0.560
No	326 (56.7)	249 (43.3)		
Perception of AI				
Positive	239 (56.0)	188 (44.0)	χ^2=0.101	0.787
Negative	101 (57.4)	75 (42.6)		
Extent of AI use				
Low	13 (61.9)	8 (38.1)	χ^2=0.282	0.866
Moderate	131 (56.5)	101 (43.5)		
High	196 (56.0)	154 (44.0)		

Statistically significant

Place of residence was significantly associated with knowledge (p=0.030), as those living on-campus showed a higher prevalence of good knowledge, 153 (61.7%), compared to those living off-campus, 187 (52.7%).

Quality of internet access did not show a statistically significant relationship (p=0.137), though good knowledge was most prevalent among those with excellent access, 116 (62.7%), compared to those with poor access, 5 (38.5%). Similarly, monthly allowance was not significantly associated with knowledge levels (p=0.365), with good knowledge reported by 265 (55.4%) of those earning <₦70,000, and 75 (60.0%) of those earning ≥ ₦70,000.

Monthly data expenditure also showed no significant association (p=0.486), with good knowledge ranging from 71 (51.8%) among the highest spenders to 62 (61.4%) among those spending ≤ ₦2,000. There was no significant difference in knowledge based on the presence of disabilities or learning challenges (p=0.560), with 14 (50.0%) of those with challenges and 326 (56.7%) of those without displaying good knowledge. Furthermore, perception of AI was not significantly linked to knowledge (p=0.787), as good knowledge was similar between those with a positive perception, 239 (56.0%), and those with a negative perception, 101 (57.4%). Finally, the extent of AI use did not significantly impact knowledge levels (p=0.866), with good knowledge reported by 13 (61.9%) of low users, 131 (56.5%) of moderate users, and 196 (56.0%) of high users.

Table 5a: Predictors of knowledge of Artificial Intelligence among respondents

Variables	β (regression coefficient)	OR	95% C.I. for OR		p-value
			Lower	Upper	
Age group (years)	-0.043	0.958	0.890	1.031	0.254
Sex					
Male*		1			
Female	0.683	1.980	1.336	2.935	**0.001****
Ethnicity					
Edo indigenes*		1			
Edo non-indigenes	0.007	1.007	0.680	1.489	0.973
Religion					
Christianity*		1			
Islam	-0.195	0.823	0.411	1.648	0.582
Others	1.142	3.132	0.304	32.282	0.337
Faculty					
Arts*		1			
Life Sciences	0.222	1.249	0.597	2.612	0.555
Management sciences	-0.592	0.553	0.220	1.391	0.208
Medicine	2.644	14.069	2.999	65.995	**0.001****
Pharmacy	-0.078	0.925	0.384	2.225	0.861
Physical sciences	0.802	2.230	0.973	5.111	0.058
Department					
Accounting*		1			
Actuarial science	-0.177	0.838	0.253	2.771	0.772
AEB	0.380	1.463	0.627	3.412	0.379
Chemistry	-0.576	0.562	0.205	1.540	0.263
History	-0.013	0.987	0.573	1.700	0.961
Academic level					
100 – 300*		1			
400 - 600	0.541	1.717	1.088	2.710	**0.020****
Residence					
On-campus*		1			
Off-campus	-0.166	0.847	0.565	1.271	0.423
Internet access					
Excellent*		1			
Poor/no access	-0.381	0.683	0.168	2.776	0.595
Fair	-0.633	0.531	0.293	0.961	**0.037****
Good	-0.444	0.642	0.410	1.005	0.053

OR: Odds ratio; CI: Confidence interval; * Reference category; ** p < 0.05, R^2= 11.6 – 15.7%.

Iincreasing age was associated with a slight reduction in the odds of good knowledge, but this relationship was not statistically significant (OR = 0.958, 95% CI: 0.890 - 1.031, p = 0.254). Sex, however, was a significant predictor, as females were nearly twice as likely as males to have good knowledge of artificial intelligence (OR = 1.980, 95% CI: 1.336 - 2.935, p = 0.001).

Edo no- indigenes had similar odds of good knowledge as indigenes (OR = 1.007, 95% CI 0.680 - 1.489, p = 0.973). Similarly, religion was not a significant predictor; although respondents practising Islam had lower odds (OR = 0.823, 95% CI: 0.411 - 1.648, p = 0.582) and those in other religions had higher odds (OR = 3.132, 95% CI: 0.304 - 32.282, p = 0.337) compared to Christians, these associations were imprecise and not statistically reliable.

Respondents who were in the faculty of medicine were about fourteen times more likely to have good knowledge compared to those in Arts (OR = 14.069, 95% CI: 2.999 - 65.995, p = 0.001). In contrast, students in Life Sciences (OR = 1.249, 95% CI: 0.597 - 2.612, p = 0.555), Management Sciences (OR = 0.553, 95% CI: 0.220 - 1.391, p = 0.208), and Pharmacy (OR = 0.925, 95% CI: 0.384 - 2.225, p = 0.861) did not differ significantly from Arts students. Those in Physical Sciences had higher odds (OR = 2.230, 95% CI: 0.973 - 5.111, p = 0.058), but this was not statistically significant.

Departmental affiliation was not significantly associated with knowledge: Actuarial Science (OR = 0.838, 95% CI: 0.253 - 2.771, p = 0.772), AEB (OR = 1.463, 95% CI: 0.627 - 3.412, p = 0.379), Chemistry (OR = 0.562, 95% CI: 0.205 - 1.540, p = 0.263), and History (OR = 0.987, 95% CI: 0.573 - 1.700, p = 0.961) all showed no significant differences from the reference group.

Academic level was a significant predictor, with students in higher levels (400 to 600) having increased odds of good knowledge (OR = 1.717, 95% CI: 1.088 - 2.710, p = 0.020).

Table 5b: Predictors of knowledge of Artificial Intelligence among respondents

Variables	β (regression coefficient)	OR	95% C.I. for OR		p-value
			Lower	Upper	
Monthly allowance (₦)					
<70,000*		1			
≥70,000	0.096	1.101	0.647	1.873	0.723
Monthly data expenditure					
> 10,000*		1			
5,001 – 10,000	0.198	1.219	0.706	2.103	0.477
2,001 – 5,000	0.336	1.400	0.798	2.457	0.241
≤ 2,000	0.357	1.429	0.724	2.820	0.303
Disabilities/learning challenges					
Yes*		1			
No	0.298	1.347	0.580	3.130	0.488
Perception of AI					
Positive*		1			
Negative	0.046	1.047	0.680	1.614	0.834
Extent of AI use					
Low*		1			
Moderate	-0.035	0.965	0.312	2.991	0.951
High	-0.206	0.813	0.263	2.515	0.720

OR: Odds ratio; CI: Confidence interval; * Reference category; ** p < 0.05; R^2 = 11.6 – 15.7%.

Respondents with higher monthly allowance >₦70,000 did not differ significantly from those with lower allowance <₦70,000 (OR = 1.101, 95% CI: 0.647 - 1.873, p = 0.723).

Monthly data expenditure was not significantly associated with knowledge across all categories: 5,001 – 10,000 (OR = 1.219, 95% CI: 0.706 - 2.103, p = 0.477), 2,001 – 5,000 (OR = 1.400, 95% CI: 0.798 - 2.457, p = 0.241), and < 2,000 (OR = 1.429, 95% CI: 0.724 - 2.820, p = 0.303).

Respondents without disabilities or learning challenges did not differ significantly from those with such challenges (OR = 1.347, 95% CI: 0.580 - 3.130, p = 0.488).

Perception of AI was not significantly associated with knowledge, as those with negative perception had similar odds compared to those with positive perception (OR = 1.047, 95% CI: 0.680 - 1.614, p = 0.834).

Extent of AI use was also not a significant predictor, with moderate use (OR = 0.965, 95% CI: 0.312 - 2.991, p = 0.951) and high use (OR = 0.813, 95% CI: 0.263 - 2.515, p = 0.720) showing no significant differences compared to low use.

SECTION C

PERCEPTION OF AI-LEARNING PLATFORMS AMONG RESPONDENTS

Table 6: Respondents' perception of AI-learning platforms

	n = 603 Freq. (%)				
Variables	**SD**	**D**	**N**	**A**	**SA**
I find AI-powered tools and technologies easy to use	1 (0.2)	7 (1.2)	76 (12.6)	299 (49.6)	220 (36.5)
AI platforms can improve my motivation to study	4 (0.7)	18 (3.0)	91 (15.1)	282 (46.8)	208 (34.5)
AI-based platforms can improve learning outcomes	0 (0.0)	7 (1.2)	75 (12.4)	270 (44.8)	251 (41.6)
AI learning tools are a valuable complement to traditional education	10 (1.7)	37 (6.1)	143 (23.7)	226 (37.5)	187 (31.0)
I trust AI to deliver accurate academic content	6 (1.0)	47 (7.8)	207 (34.3)	217 (36.0)	126 (20.9)
I believe AI can be biased or misleading	17 (2.8)	87 (14.4)	182 (30.2)	211 (35.0)	106 (17.6)
I think AI platforms should be officially integrated into university curricula	10 (1.7)	36 (6.0)	162 (26.9)	227 (37.6)	168 (27.9)
AI will eventually replace some roles of traditional lecturers	20 (3.3)	96 (15.9)	147 (24.4)	224 (37.1)	116 (19.2)
AI systems respect student privacy and data protection	8 (1.3)	33 (5.5)	177 (29.4)	243 (40.3)	142 (23.5)
AI addresses diverse learning styles	5 (0.8)	12 (2.0)	121 (20.2)	279 (46.3)	186 (30.8)

SD = Strongly Disagree; D = Disagree; N = Neutral; A = Agree; SA = Strongly Agree.

Majority agreed that AI tools are easy to use, with 220 (36.5%) strongly agreeing and 299 (49.6%) agreeing. Similarly, many respondents agreed that AI can improve motivation to study, with 208 (34.5%) strongly agreeing and 282 (46.8%) agreeing, as well as enhance learning outcomes, with 251 (41.6%) strongly agreeing and 270 (44.8%) agreeing. In addition, respondents viewed AI learning tools as a valuable complement to traditional education, with 187 (31.0%) strongly agreeing and 226 (37.5%) agreeing, and supported their integration into university curricula, with 168 (27.9%) strongly agreeing and 227 (37.6%) agreeing.

Some respondents, 207 (34.3%) were neutral regarding trust in AI to deliver accurate academic content, and whether AI systems respect student privacy and data protection, 177 (29.4%). Despite this, many acknowledged that AI addresses diverse learning

styles, with 186 (30.8%) strongly agreeing and 279 (46.3%) agreeing, and that it could replace some roles of traditional lecturers, with 116 (19.2%) strongly agreeing and 224 (37.1%) agreeing

Table 7: Perception of the role of Artificial Intelligence in education and associated concerns among respondents

Variables	Frequency (n = 603)	Percent
Role of AI in education		
Useful	309	51.2
Provides academic support	256	42.5
Enhances efficiency and accessibility	38	6.3
Concerns about AI (n=603)		
I don't have a concern	343	56.9
It can make students lazy	50	8.3
Inaccuracy and misinformation	41	6.8
Data privacy and security concerns	28	4.6
Cost	20	3.3
Technical limitations and usability issues	20	3.3
Limits thinking ability	20	3.3
Job displacement and human replacement	18	3.0
Dependence	18	3.0
Bias and lack of objectivity	15	2.6
Misuse and academic dishonesty	13	2.1
Accessibility	13	2.1
Poor enhancement	4	0.7

Most respondents perceived AI as useful 309 (51.2%), while 256 (42.5%) reported that it provides academic support, and a smaller proportion 38 (6.3%) noted that it enhances efficiency and accessibility.

More than half of the respondents had no concerns 346 (56.9%), the most common concern was that AI can make students lazy 50 (8.3%), followed by inaccuracy and misinformation 41 (6.8%), and data privacy and security concerns 28 (4.6%). Other concerns included cost, technical limitations and usability issues, and limits to thinking ability 20 (3.3%) each. Job displacement and dependence were reported by 18 (3.0%) each, while bias and lack of objectivity accounted for 15 (2.6%). Misuse

and academic dishonesty and accessibility were each reported by 13 (2.1%), and a few respondents noted that AI has potential and can be enhanced 4 (0.7%).

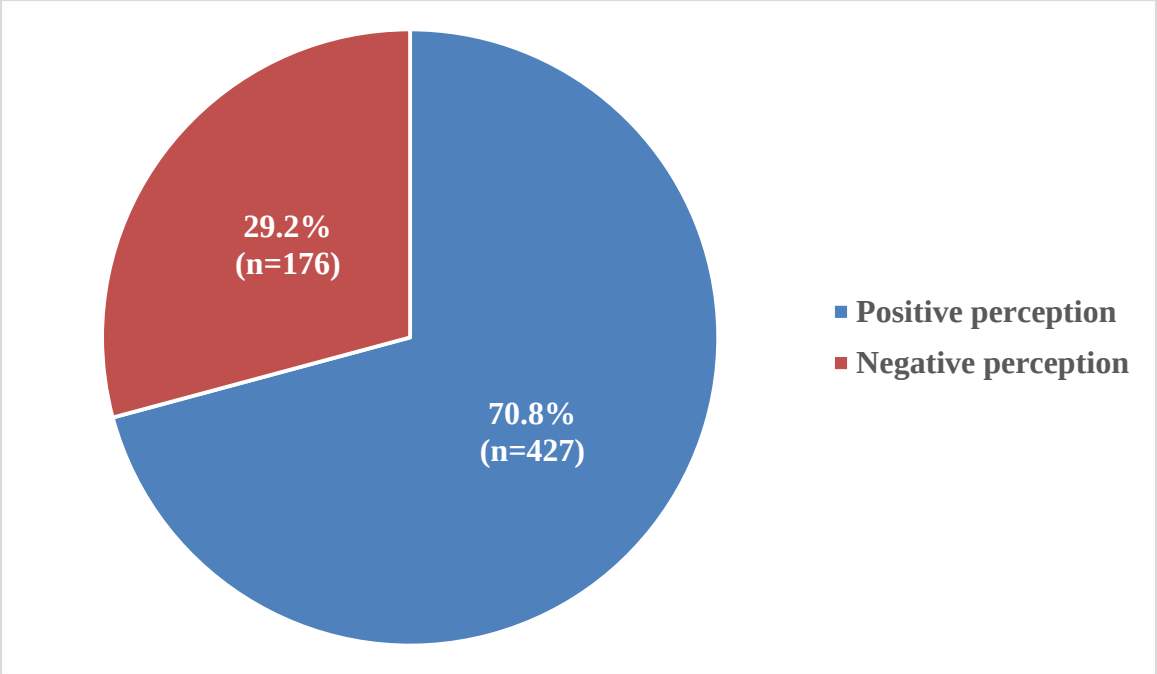

Figure 2: Respondents' overall perception of Artificial Intelligence

Majority of the respondents held a positive perception, 427 (70.8%), while a smaller proportion expressed a negative perception, 176 (29.2%) toward artificial intelligence.

Table 8a: Association between respondents' sociodemographic characteristics and perception of AI

Variables	Perception of AI		Test statistic	p-value
	Positive (n=427) Freq. (%)	Negative (n=176) Freq. (%)		
Age group (years)				
< 20	214 (69.0)	96 (31.0)	$\chi^2 = 0.978$	0.326
≥ 20	213 (72.7)	80 (27.3)		
Sex				
Male	182 (73.4)	66 (26.6)	$\chi^2 = 1.351$	0.275
Female	245 (69.0)	110 (31.0)		
Ethnicity				
Edo non-indigenes	153 (70.5)	64 (29.5)	$\chi^2 = 0.015$	0.926
Edo indigenes	274 (71.0)	112 (29.0)		
Religion				
Christianity	386 (70.6)	161 (29.4)	$\chi^2 = 0.187$	0.923
Islam	35 (72.9)	13 (27.1)		
Others*	6 (75.0)	2 (25.0)		
Faculty				
Arts	190 (69.9)	82 (30.1)	$\chi^2 = 2.450$	0.787
Life Sciences	89 (70.1)	38 (29.9)		
Management sciences	40 (74.1)	14 (25.9)		
Medicine	26 (72.2)	10 (27.8)		
Pharmacy	20 (62.5)	12 (37.5)		
Physical sciences	62 (75.6)	20 (24.4)		
Department				
Accounting	20 (74.1)	7 (25.9)	$\chi^2 = 14.212$	0.115
Actuarial science	20 (74.1)	7 (25.9)		
AEB	47 (73.4)	17 (26.6)		
Chemistry	37 (90.2)	4 (9.8)		
Computer science	25 (61.0)	16 (39.0)		
History	89 (65.4)	47 (34.6)		
ISD	101 (74.3)	35 (25.7)		
Medicine	26 (72.2)	10 (27.8)		
Optometry	42 (66.7)	21 (33.3)		
Pharmacy	20 (62.5)	12 (37.5)		
Academic level				
100 – 300	299 (70.9)	123 (29.1)	$\chi^2 = 0.001$	>0.999
400 – 600	128 (70.7)	53 (29.3)		
Residence				
Off-campus	256 (72.1)	99 (27.9)	$\chi^2 = 0.706$	0.414
On-campus	171 (69.0)	77 (31.0)		

African Traditional Religion, Agnostic, Hecate devotee, Hinduism, and Non-religious.

Age group did not significantly influence perception (p=0.326), with positive views held by 214 (69.0%) of those under 20 years, and 213 (71.8%) of those aged $\geq$ 20. Similarly, sex was not a significant factor (p=0.275), though a slightly higher percentage of males, 182 (73.4%), reported a positive perception compared to females, 245 (69.0%). No significant differences were observed regarding ethnicity (p=0.926) or religion (p=0.923), with positive perceptions remaining consistent across Edo indigenes, 274 (71.0%), and non-indigenes, 153 (70.5%), as well as among Christians, 386 (70.6%), and Muslims, 35 (72.9%).

Educational background also showed no significant association with perception at the faculty level (p=0.787) or the departmental level (p=0.115). Positive perceptions were highest in Physical Sciences, 62 (75.6%), and Management Sciences, 40 (74.1%), while Chemistry recorded the highest departmental positive rating at 37 (90.2%). Academic level did not significantly impact views (p=0.420), with positive perceptions ranging from 104 (73.2%) in the 100 level to 25 (59.5%) among those in the 500 level and above. Finally, place of residence was not a significant predictor (p=0.414), with 256 (72.1%) of off-campus residents and 171 (69.0%) of on-campus residents maintaining a positive perception of AI.

Table 8b: Table: Association between respondents' socio-economic status and perception of AI

Variables	Perception of AI		Test statistic	p-value
	Positive (n=427) Freq. (%)	Negative (n=176) Freq. (%)		
Internet access				
Excellent	144 (77.8)	41 (22.2)	9.220+	**0.041***
Good	203 (65.7)	106 (34.3)		
Fair	70 (73.7)	25 (26.3)		
Poor	10 (71.4)	4 (28.6)		
No access	1 (100.0)	0 (0.0)		
Monthly allowance (₦)				
<70,000	336 (70.3)	142 (29.7)	$\chi^2 = 0.301$	0.659
≥ 70,000	91 (72.8)	34 (27.2)		
Monthly data expenditure				
≤ 2,000	62 (61.4)	39 (38.6)	$\chi^2 = 8.903$	**0.031***
2,001 – 5,000	163 (77.3)	48 (22.7)		
5,001 – 10,000	106 (68.8)	48 (31.2)		
> 10,000	96 (70.1)	41 (29.9)		
Disabilities/learning challenges				
Yes	21 (75.0)	7 (25.0)	$\chi^2 = 0.249$	0.677
No	406 (70.6)	169 (29.4)		
Knowledge of AI				
Good	239 (70.3)	101 (29.7)	$\chi^2 = 0.101$	0.787
Poor	188 (71.5)	75 (28.5)		
Extent of AI use				
Low	7 (33.3)	14 (66.7)	$\chi^2 = 35.853$	**<0.001***
Moderate	142 (61.2)	90 (38.8)		
High	278 (79.4)	72 (20.6)		

Statistically significant; +Fisher's Exact Test.

Internet access was found to be a significant factor (p=0.041), with the highest proportion of positive perceptions observed among those with excellent access, 144 (77.8%), compared to those with good access, 203 (65.7%). Monthly allowance did not show a statistically significant association (p=0.659). However, monthly data

expenditure was significantly associated with perception (p=0.031), with those spending ₦2,001–5,000 reporting the highest positive perception, 163 (77.3%), while the lowest was seen in those spending ≤ ₦2,000, 62 (61.4%).

The presence of disabilities or learning challenges did not significantly influence perception (p=0.677), with 21 (75.0%) of those with challenges and 406 (70.6%) of those without challenges holding a positive view. Similarly, overall knowledge of AI was not significantly associated with perception (p=0.787), as positive views were nearly identical between those with good knowledge, 239 (70.3%), and those with poor knowledge, 188 (71.5%). In contrast, the extent of AI use was a highly significant predictor of perception (p<0.001); respondents with a high extent of use reported the most positive perception, 278 (79.4%), whereas only 7 (33.3%) of low users viewed AI positively, with the majority of that group, 14 (66.7%), reporting a negative perception.

Table 9a: Predictors of respondents' perception of Artificial Intelligence

Variables	β (regression coefficient)	OR	95% C.I. for OR		p-value
			Lower	Upper	
Age group (years)	0.020	1.021	0.938	1.110	0.636
Sex					
Male*		1			
Female	-0.441	0.644	0.413	1.002	0.051
Ethnicity					
Edo indigenes*		1			
Edo non-indigenes	-0.029	0.971	0.632	1.492	0.893
Religion					
Christianity*		1			
Islam	-0.211	0.810	0.365	1.797	0.604
Others	-0.168	0.845	0.087	8.258	0.885
Faculty					
Arts*		1			
Life Sciences	-0.157	0.855	0.374	1.950	0.709
Management sciences	-0.069	0.933	0.314	2.777	0.901
Medicine	0.235	1.265	0.465	3.440	0.645
Pharmacy	-0.730	0.482	0.186	1.247	0.132
Physical sciences	-0.814	0.443	0.183	1.072	0.071
Department					
Accounting*		1			
Actuarial science	-0.011	0.990	0.248	3.943	0.988
AEB	-0.329	0.720	0.290	1.787	0.478
Chemistry	2.181	8.854	2.350	33.359	**0.001****
History	-0.480	0.619	0.335	1.142	0.125
Academic level					
100 – 300*		1			
400 – 600	0.046	1.047	0.635	1.725	0.858
Residence					
On-campus*		1			
Off-campus	-0.021	0.979	0.626	1.529	0.925
Internet access					
Excellent*		1			
Poor/no access	0.470	1.600	0.274	9.328	0.601
Fair	-0.134	0.875	0.440	1.740	0.703
Good	-0.634	0.531	0.322	0.874	**0.013****

OR: Odds ratio; CI: Confidence interval; * Reference category; ** p < 0.05, R^2=11.2 – 16.1%.

Age group was not significantly associated with perception toward artificial intelligence (OR = 1.021, 95% CI: 0.938–1.110, p = 0.636). Sex was also not statistically significant, although females had lower odds of positive perception compared to males (OR = 0.644, 95% CI: 0.413–1.002, p = 0.051), which was borderline.

Edo non-indigenes had similar odds of perception toward artificial intelligence as indigenes (OR = 0.971, 95% CI: 0.632–1.492, p = 0.893). Religion was also not significant, with Islam (OR = 0.810, 95% CI: 0.365–1.797, p = 0.604) and other religions (OR = 0.845, 95% CI: 0.087–8.258, p = 0.885) showing no significant differences compared to Christianity.

None of the faculties including Life Sciences (OR = 0.855, 95% CI: 0.374–1.950, p = 0.709), Management Sciences (OR = 0.933, 95% CI: 0.314–2.777, p = 0.901), Medicine (OR = 1.265, 95% CI: 0.465–3.440, p = 0.645), Pharmacy (OR = 0.482, 95% CI: 0.186–1.247, p = 0.132), and Physical Sciences (OR = 0.443, 95% CI: 0.183–1.072, p = 0.071) were significant predictors of positive perception,

Those in Chemistry department were shown to have a higher odds of the positive perception toward AI compared to those in Accounting (OR = 8.854, 95% CI: 2.350–33.359, p = 0.001). Actuarial Science (OR = 0.990, 95% CI: 0.248–3.943, p = 0.988), AEB (OR = 0.720, 95% CI: 0.290–1.787, p = 0.478), and History (OR = 0.619, 95% CI: 0.335–1.142, p = 0.125) were not significant.

Academic level was not significantly associated with perception toward artificial intelligence (OR = 1.047, 95% CI: 0.635–1.725, p = 0.858), and place of residence also showed no significant effect (OR = 0.979, 95% CI: 0.626–1.529, p = 0.925).

Respondents who had a good internet connection had lower odds of positive perception compared to those with excellent access (OR = 0.531, 95% CI: 0.322–0.874, p = 0.013). Poor or no access (OR = 1.600, 95% CI: 0.274–9.328, p = 0.601) and fair access (OR = 0.875, 95% CI: 0.440–1.740, p = 0.703) were not significant predictors.

Table 9b: Predictors of respondents' perception of Artificial Intelligence

Variables	β (regression coefficient)	OR	95% C.I. for OR		p-value
			Lower	Upper	
Monthly allowance (₦)					
<70,000*		1			
≥70,000	-0.224	0.800	0.444	1.441	0.457
Monthly data expenditure					
> 10,000*		1			
5,001 – 10,000	-0.272	0.762	0.371	1.565	0.459
2,001 – 5,000	0.568	1.765	0.931	3.347	0.082
≤ 2,000	-0.039	0.962	0.530	1.745	0.898
Disabilities/learning challenges					
Yes*		1			
No	-0.317	0.728	0.257	2.062	0.550
Knowledge of AI					
Good*		1			
Poor	0.033	1.034	0.673	1.588	0.880
Extent of AI use					
Low*		1			
Moderate	1.134	3.108	1.009	9.573	**0.048****
High	2.082	8.020	2.585	24.888	**<0.001****

OR: Odds ratio; CI: Confidence interval; * Reference category; ** p < 0.05, R^2=11.2 – 16.1%.

Monthly allowance was not a significant predictor of perception toward artificial intelligence, as respondents earning above ₦70,000 had similar odds compared to those earning less (OR = 0.800, 95% CI: 0.444–1.441, p = 0.457).

Monthly data expenditure was also not a significant predictor across all categories, including 5,001–10,000 (OR = 0.762, 95% CI: 0.371–1.565, p = 0.459), 2,001–5,000 (OR = 1.765, 95% CI: 0.931–3.347, p = 0.082), and <2,000 (OR = 0.962, 95% CI: 0.530–1.745, p = 0.898).

Disabilities or learning challenges were not a significant predictor of perception toward artificial intelligence, as respondents without disabilities had comparable odds to those with disabilities (OR = 0.728, 95% CI: 0.257–2.062, p = 0.550).

Knowledge of AI was also not a significant predictor, with respondents with poor knowledge showing no meaningful difference compared to those with good knowledge (OR = 1.034, 95% CI: 0.673–1.588, p = 0.880).

Extent of AI use was a significant predictor of perception toward artificial intelligence. Respondents with moderate use had higher odds of positive perception compared to those with low use (OR = 3.108, 95% CI: 1.009–9.573, p = 0.048), while those with high use also had markedly higher odds (OR = 8.020, 95% CI: 2.585–24.888, p < 0.001).

SECTION D

USE OF ARTIFICIAL INTELLIGENCE AMONG RESPONDENTS

Table 10: AI platforms used by respondents

Variables	Frequency (n = 603)	Percent
Use AI-driven learning platforms (n=603)		
Yes	546	90.5
No	57	9.5
AI-driven learning platforms used (n=546) *		
ChatGPT	450	82.4
Bard/Gemini	171	31.3
Duolingo	154	28.2
Grammarly	114	20.8
Coursera	102	18.6
Claude	97	17.7
Google classroom with AI features	55	10.0
Google teams with AI features	52	9.5
Khan academy	49	8.9
Quizlet	42	7.6
BYJU'S	33	6.0
Chegg	15	2.7
DeepSeek	13	2.3
Gradescope	10	1.8
Meta AI	7	1.2
Grok	5	0.9
Other**	5	0.9
Devices used to access AI-driven learning platforms (n=546) *		
Smartphone	516	94.5
Laptop	140	25.6
Desktop computer	24	4.3
Tablet	18	3.2
Time spent on AI-driven platforms per session (hours) (n=546)		
≤ 1	173	31.7
2 – 4	306	56.0
≥ 5	67	12.3
Mean $\pm$ SD of time spent on AI platforms (hours)	2.75 ± 2.73	

Multiple response question; **Siri, Perplexity, Gizmo, Copilot and Monica AI.

Most respondents 546 (90.5%) reported using AI driven learning platforms, while 57 (9.5%) did not. The most commonly used platform was ChatGPT 450 (82.4%), followed by Bard or Gemini 171 (31.3%), Duolingo 154 (28.2%), and Grammarly 114 (20.8%). Other frequently used platforms included Coursera 102 (18.6%), Claude 97 (17.7%), Google Classroom with AI features 55 (10.0%), Google Teams with AI

features 52 (9.5%), Khan Academy 49 (8.9%), and Quizlet 42 (7.6%). Less commonly used platforms included BYJU'S 33 (6.0%), Chegg 15 (2.7%), DeepSeek 13 (2.3%), Gradescope 10 (1.8%), Meta AI 7 (1.2%), Grok 5 (0.9%), and other platforms 5 (0.9%).

Smartphones were most common device used 516 (94.5%), followed by laptops 140 (25.6%), desktop computers 24 (4.3%), and tablets 18 (3.2%). Most respondents, 306 (56.0%) spent 2 to 4 hours, followed by less than 1 hour 173 (31.7%), while 67 (12.3%) spent more than 5 hours. The mean time spent on AI platforms was 2.75 ± 2.73 hours.

Table 11: Frequency of AI use for academic activities among respondents

Variables	n = 546 Freq. (%) Always	Often	Sometimes	Rarely	Never
I use AI for explanations of difficult concepts	294 (53.8)	172 (31.5)	74 (13.6)	6 (1.1)	0 (0.0)
I combine AI with textbooks or lecture notes	219 (40.1)	143 (26.2)	128 (23.4)	38 (7.0)	18 (3.3)
I use AI platforms to assist with assignments	211 (38.6)	204 (37.4)	122 (22.3)	8 (1.5)	1 (0.2)
I use AI to summarize academic articles	200 (36.6)	169 (31.0)	135 (24.7)	31 (5.7)	11 (2.0)
I use AI to search for academic materials	186 (34.1)	168 (30.8)	123 (22.5)	48 (8.8)	21 (3.8)
I use AI for test preparation	179 (32.8)	160 (29.3)	140 (25.6)	47 (8.6)	20 (3.7)
I use AI to generate study plans	177 (32.4)	137 (25.1)	120 (22.0)	72 (13.2)	40 (7.3)
I use AI during group discussions or projects	168 (30.8)	169 (31.0)	149 (27.3)	60 (11.0)	0 (0.0)
I rely heavily on AI platforms for daily learning tasks	120 (22.0)	129 (23.6)	151 (27.7)	104 (19.0)	42 (7.7)

Most respondents, 294 (53.8%) reported that they always use AI for explanations of difficult concepts while 172 (31.5%) often do so, 74 (13.6%) sometimes, and 6 (1.1%) rarely. For combining AI with textbooks or lecture notes, 219 (40.1%) always use it, 143 (26.2%) often, 128 (23.4%) sometimes, 38 (7.0%) rarely, and 18 (3.3%) never.

AI was always used for assignments by 211 (38.6%), whereas 204 (37.4%) reported often, 122 (22.3%) sometimes, 8 (1.5%) rarely, and 1 (0.2%) never. For its use in summarising academic articles, 200 (36.6%) reported always, 169 (31.0%) often, 135 (24.7%) sometimes, 31 (5.7%) rarely, and 11 (2.0%) never.

Searching for academic materials was reported by 186 (34.1%) as always, 168 (30.8%) often, 123 (22.5%) sometimes, 48 (8.8%) rarely, and 21 (3.8%) never. For test

preparation, 179 (32.8%) always use AI, 160 (29.3%) often, 140 (25.6%) sometimes, 47 (8.6%) rarely, and 20 (3.7%) never. Generating study plans was reported as 177 (32.4%) always, 137 (25.1%) often, 120 (22.0%) sometimes, 72 (13.2%) rarely, and 40 (7.3%) never.

AI was always used during group discussions or projects by 168 (30.8%) respondents, while 169 (31.0%) used it often, 149 (27.3%) sometimes, and 60 (11.0%) rarely used it. Reliance on AI for daily learning tasks was always for 120 (22.0%) respondents, whereas 129 (23.6%) responded as often, 151 (27.7%) sometimes, 104 (19.0%) rarely, and 42 (7.7%) never.

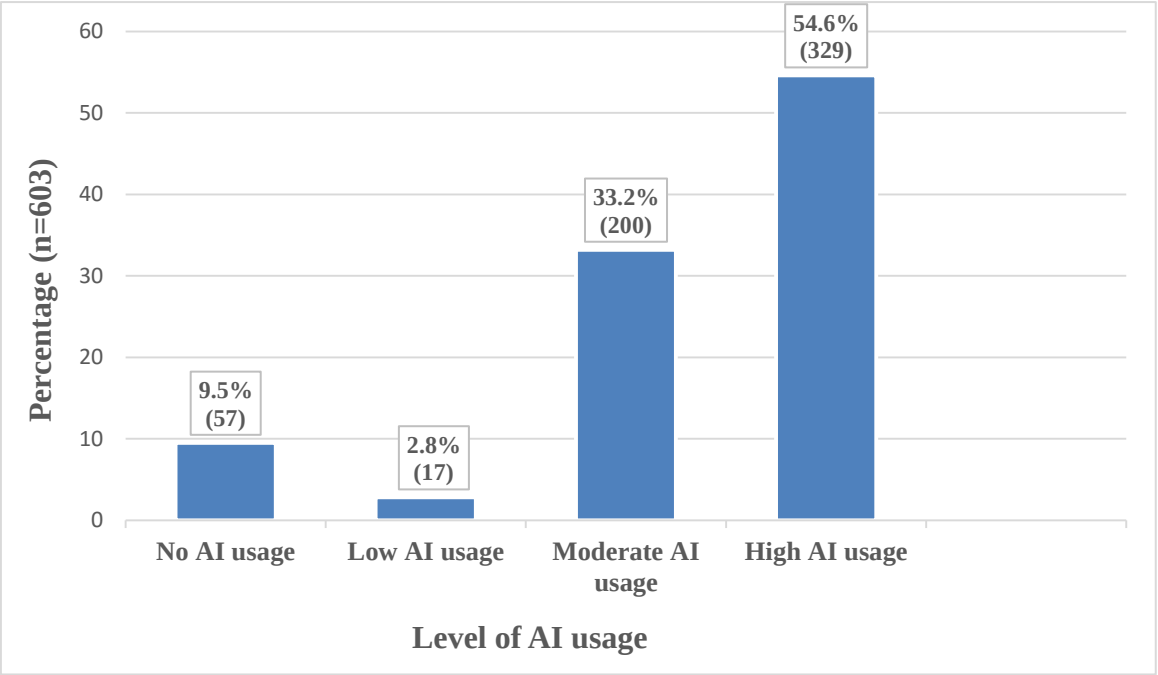

Figure 3: Extent of Artificial Intelligence use among respondents.

More than half of the respondents 329 (54.6%) reported high use of AI platforms, while 200 (33.2%) had moderate use. A smaller proportion 17 (2.8%) reported low use, while 57 (9.5%) indicated that they had never used AI platforms

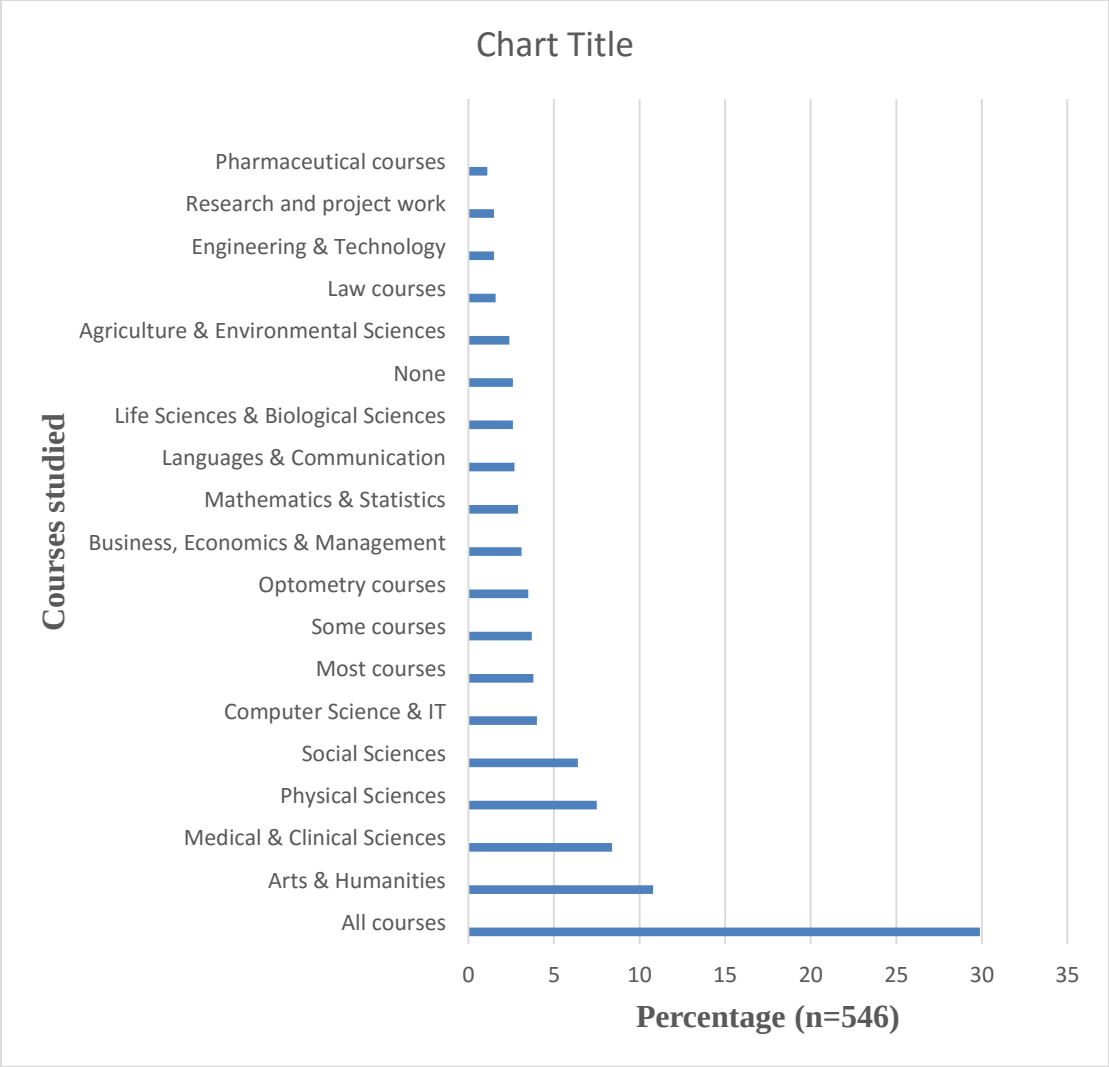

Figure 4: Courses studied by respondents using AI platforms

Majority of students reported applying AI tools in their studies, with 163 (29.9%) indicating use across all courses. This was followed by Arts and Humanities at 59 (10.8%), Medical and Clinical Sciences at 46 (8.4%), and Physical Sciences at 41 (7.5%).

Selective usage was observed in Social Sciences, 35 (6.4%), Computer Science and IT, 22 (4.0%), while 21 (3.8%) reported use for most courses and 20 (3.7%) for some

courses. Other disciplines included Optometry, 19 (3.5%), Business, Economics and Management, 17 (3.1%), and Mathematics and Statistics, 16 (2.9%).

Lower frequencies were recorded in Languages and Communication, 15 (2.7%), Life Sciences and Biological Sciences, 14 (2.6%), and Agriculture and Environmental Sciences, 13 (2.4%). The least reported AI integration was in Law, 9 (1.6%), Engineering and Technology, 8 (1.5%), Research and project work, 8 (1.5%), and Pharmaceutical courses, 6 (1.1%). Notably, 14 (2.6%) of respondents indicated no use of AI for any specific course.

Table 12a: Association between sociodemographic characteristics and respondents' use of Artificial Intelligence

Variables	Use of AI		Test statistic	p-value
	Yes (n=546) Freq. (%)	No (n=57) Freq. (%)		
Age group (years)				
< 20	286 (92.3)	24 (7.7)	χ^2 =2.182	0.164
≥ 20	260 (88.7)	33 (11.3)		
Sex				
Male	225 (90.7)	23 (9.3)		
Female	321 (90.4)	34 (9.6)	χ^2 = 0.016	>0.999
Ethnicity				
Edo non-indigenes	200 (92.2)	17 (7.8)	χ^2 =1.038	0.316
Edo indigenes	346 (89.6)	40 (10.4)		
Religion				
Christianity	500 (91.4)	47 (8.6)		
Islam	41 (85.4)	7 (14.6)	7.724+	**0.014***
Others**	5 (62.5)	3 (37.5)		
Faculty				
Arts	238 (87.5)	34 (12.5)		
Life Sciences	117 (92.1)	10 (7.9)	χ^2 = 7.202	0.202
Management sciences	49 (90.7)	5 (9.3)		
Medicine	35 (97.2)	1 (2.8)		
Pharmacy	29 (90.6)	3 (9.4)		
Physical sciences	78 (95.1)	4 (4.9)		
Department				
Accounting	25 (92.6)	2 (7.4)		
Actuarial science	24 (88.9)	3 (11.1)	18.880	**0.026***
AEB	64 (100.0)	0 (0.0)		
Chemistry	40 (97.6)	1 (2.4)		
Computer science	38 (92.7)	3 (7.3)		
History	122 (89.7)	14 (10.3)		
ISD	116 (85.3)	20 (14.7)		
Medicine	35 (97.2)	1 (2.8)		
Optometry	53 (84.1)	10 (15.9)		
Pharmacy	29 (90.6)	3 (9.4)		
Academic level				
100 - 300	382 (90.5)	40 (9.5)	χ^2 =0.001	>0.999
300 – 600	164 (90.6)	17 (9.4)		

Statistically significant; **African Traditional Religion, Agnostic, Hecate devotee, Hinduism, and Non-religious; +Fisher's Exact Test.

There was no statistically significant association between age group and use of artificial intelligence (p = 0.164) although respondents aged above 20 years had a slightly higher proportion of the outcome 33 (11.3%) compared to those below 20 years 24 (7.7%).

Religion was significantly associated with AI use (p = 0.014), with usage highest among Christians 500 (91.4%), followed by Muslims 41 (85.4%) and others 5 (62.5%). Department was also significant (p = 0.026), with highest use in AEB 64 (100.0%), Medicine 35 (97.2%), and Chemistry 40 (97.6%), and lower rates in Optometry 53 (84.1%) and ISD 116 (85.3%).

Sex (p > 0.999), ethnicity (p = 0.316), faculty (p = 0.202), and academic level (p = >0.999) were not significantly associated, with consistently high usage across groups. Residence was not significant (p = 0.089), though usage was slightly higher on campus 231 (93.1%) than off campus 315 (88.7%).

Table 12b: Association between socio-economic status and respondents' use of Artificial Intelligence

Variables	Use of AI		Test statistic	p-value
	Yes (n=546) Freq. (%)	No (n=57) Freq. (%)		
Internet access				
Excellent	169 (91.4)	16 (8.6)	6.820+	0.150
Good	282 (91.3)	27 (8.7)		
Fair	85 (89.5)	10 (10.5)		
Poor	9 (69.2)	4 (30.8)		
No access	1 (100.0)	0 (0.0)		
Monthly allowance (₦)				
<70,000	428 (89.5)	50 (10.5)	$\chi^2 = 2.735$	0.122
≥ 70,000	118 (94.4)	7 (5.6)		
Monthly data expenditure				
≤ 2,000	87 (86.1)	14 (13.9)	$\chi^2 = 3.593$	0.308
2,001 – 5,000	190 (90.0)	21 (10.0)		
5,001 – 10,000	142 (92.2)	12 (7.8)		
> 10,000	127 (92.7)	10 (7.3)		
Disabilities/learning challenges				
Yes	27 (96.4)	1 (3.6)	1.187+	0504
No	519 (90.3)	56 (9.7)		
Knowledge of AI				
Good	323 (95.0)	17 (5.0)	$\chi^2 = 18.058$	**<0.001***
Poor	223 (84.8)	40 (15.2)		
Perception of AI				
Positive	394 (92.3)	33 (7.7)	$\chi^2 = 5.082$	**0.031***
Negative	152 (86.4)	24 (13.6)		

Statistically significant; +Fisher's Exact Test.

Internet access was not significantly associated (p = 0.150), although usage was lowest among those with poor access 9 (69.2%). Monthly allowance also was not significantly associated with use of artificial intelligence (p = 0.122). However, there was a higher usage among those who earned above ₦70,000, 118 (94.4%) compared to 428 (89.5) of those who earned less.

Knowledge of AI was also significant ($p < 0.001$), with higher use among those with good knowledge 323 (95.0%) compared to poor knowledge 223 (84.8%). Similarly, perception of AI was significant ($p = 0.031$), with higher use among those with positive perception 394 (92.3%) than negative perception 152 (86.4%).

Monthly data expenditure ($p = 0.308$) and presence of disabilities or learning challenges ($p = 0.504$) were also not significant, with consistently high usage across categories.

Table 13a: Predictors of respondents' use of Artificial Intelligence

Variables	β (regression coefficient)	OR	95% C.I. for OR		p-value
			Lower	Upper	
Age group (years)	-0.116	0.891	0.795	0.998	**0.045****
Sex					
Male*		1			
Female	-0.048	0.953	0.495	1.834	0.885
Ethnicity					
Edo indigenes*		1			
Non-Edo indigenes	0.473	1.605	0.813	3.167	0.173
Religion					
Christianity*		1			
Islam	-0.819	0.441	0.159	1.219	0.114
Others	-2.845	0.058	0.009	0.382	**0.003****
Faculty					
Arts*		1			
Life Sciences	-0.431	0.650	0.242	1.747	0.393
Management sciences	0.430	1.538	0.310	7.633	0.599
Medicine	1.257	3.515	0.398	31.072	0.258
Pharmacy	0.587	1.799	0.423	7.645	0.427
Physical sciences	0.763	2.145	0.513	8.968	0.296
Department					
Accounting*		1			
Actuarial science	0.097	1.102	0.152	8.009	0.924
AEB	19.751	3.78E+08	0.000	—	0.997
Chemistry	0.800	2.225	0.196	25.207	0.518
History	0.387	1.472	0.663	3.270	0.342
Academic level					
100 - 300*		1			
400 – 600	0.226	1.253	0.606	2.594	0.543
Place of residence					
On-campus*		1			
Off-campus	-0.308	0.735	0.363	1.488	0.392
Self-rated internet connectivity					
Excellent*		1			
Poor/no access	-1.302	0.272	0.064	1.161	0.079
Fair	-0.136	0.873	0.343	2.218	0.774
Good	0.240	1.272	0.607	2.665	0.524

OR: Odds ratio; CI: Confidence interval; * Reference category; ** $p < 0.05$; $R^2 = 11.1 – 23.9\%$.

Age was a significant predictor of AI usage, with increasing age associated with lower odds of use (OR = 0.891, 95% CI: 0.795–0.998, p = 0.045). Sex was not a significant predictor (OR = 0.953, 95% CI: 0.495–1.834, p = 0.885). Ethnicity did not significantly predict AI usage although Edo non-indigenes were over 1.5 more likely to have a higher usage compared to Edo indigenes (OR = 1.605, 95% CI: 0.813–3.167, p = 0.173).

Religion was a significant predictor overall, with respondents in "other religions" showing significantly lower odds of AI use compared to Christians (OR = 0.058, 95% CI: 0.009–0.382, p = 0.003), while Islam was not significant (OR = 0.441, 95% CI: 0.159–1.219, p = 0.114).

Faculty was not a significant predictor across all categories (p > 0.05). Similarly, department was not significant overall, although individual categories did not show meaningful predictive effects. Academic level was also not a significant predictor of AI usage (OR = 1.253, 95% CI: 0.606–2.594, p = 0.543), and place of residence showed no significant effect (OR = 0.735, 95% CI: 0.363–1.488, p = 0.392).

Internet connectivity was not a significant predictor of AI usage (OR = 0.272, 95% CI: 0.064–1.161, p = 0.079). Monthly allowance (OR = 1.850, 95% CI: 0.637–5.370, p = 0.258) and data expenses were also not significant predictors.

Table 13b: Predictors of respondents' use of Artificial Intelligence

Variables	β (regression coefficient)	OR	95% C.I. for OR		p-value
			Lower	Upper	
Monthly allowance (₦)					
< 70,000*		1			
≥ 70,000	0.615	1.850	0.637	5.370	0.258
Monthly data expenditure					
> 10,000*		1			
5,001–10,000	0.165	1.180	0.435	3.202	0.746
2,001–5,000	-0.475	0.622	0.237	1.629	0.334
<2,000	-0.712	0.491	0.176	1.367	0.173
Disabilities/learning challenges					
Yes*		1			
No	-1.254	0.285	0.034	2.403	0.249
Knowledge of AI					
Good*		1			
Poor	-1.079	0.340	0.177	0.654	**0.001****
Perception of AI					
Positive*		1			
Negative	0.736	2.087	1.097	3.972	**0.025****

OR: Odds ratio; CI: Confidence interval; * Reference category; ** $p < 0.05$; R^2 = 11.1 – 23.9%.

Disabilities or learning challenges did not significantly predict AI usage even though those who did not have a disability were shown to be nearly four times less likely to use AI platforms (OR = 0.285, 95% CI: 0.034–2.403, p = 0.249).

Knowledge of AI was a significant predictor, with higher knowledge associated with lower odds of AI usage (OR = 0.340, 95% CI: 0.177–0.654, p = 0.001). In contrast, perception of AI was also a significant predictor, with higher perception scores associated with increased odds of AI usage (OR = 2.087, 95% CI: 1.097–3.972, p = 0.025).

Table 14a: Association between respondents' sociodemographic characteristics and level of use of AI

Variables	Use of AI			Test statistic	p-value
	Low (n=17) Freq. (%)	Moderate (n=200) Freq. (%)	High (n=329) Freq. (%)		
Age group (years)					
< 20	13 (4.5)	110 (38.5)	163 (57.0)	χ^2=5.567	0.064
≥ 20	4 (1.5)	90 (34.6)	166 (63.8)		
Sex					
Male	9 (4.0)	74 (32.9)	142 (63.1)	χ^2=2.946	0.226
Female	8 (2.5)	126 (39.3)	187 (58.3)		
Ethnicity					
Edo non-indigenes	8 (4.0)	69 (34.5)	123 (61.5)	χ^2=1.268	0.551
Edo indigenes	9 (2.6)	131 (37.9)	206 (59.5)		
Religion					
Christianity	16 (3.2)	186 (37.2)	298 (59.6)	7.036+	0.139
Islam	0 (0.0)	13 (31.7)	28 (68.3)		
Others**	1 (20.0)	1 (20.0)	3 (60.0)		
Faculty					
Arts	8 (3.4)	98 (41.2)	132 (55.5)	19.569+	**0.034***
Life Sciences	4 (3.4)	32 (27.4)	81 (69.2)		
Physical sciences	3 (3.8)	33 (42.3)	42 (53.8)		
Management sciences	0 (0.0)	18 (36.7)	31 (63.3)		
Medicine	1 (2.9)	16 (45.7)	18 (51.4)		
Pharmacy	1 (3.4)	3 (10.3)	25 (86.2)		
Department					
Accounting	0 (0.0)	8 (32.0)	17 (68.0)	26.729+	0.084
Actuarial science	0 (0.0)	10 (41.7)	14 (58.3)		
AEB	1 (1.6)	13 (20.3)	50 (78.1)		
Chemistry	1 (2.5)	19 (47.5)	20 (50.0)		
Computer science	2 (5.3)	14 (36.8)	22 (57.9)		
History	4 (3.3)	51 (41.8)	67 (54.9)		
ISD	4 (3.4)	47 (40.5)	65 (56.0)		
Optometry	3 (5.7)	19 (35.8)	31 (58.5)		
Medicine	1 (2.9)	16 (45.7)	18 (51.4)		
Pharmacy	1 (3.4)	3 (10.3)	25 (86.2)		
Academic level					
100 – 300	13 (3.4)	147 (38.5)	222 (58.1)	χ^2=2.501	0.308
400 – 600	4 (2.4)	53 (32.3)	107 (65.2)		

Statistically significant; +Fisher's exact Test; **African Traditional Religion, Agnostic, Hecate devotee, Hinduism, and Non-religious.

Age group was not significantly associated with the extent of AI usage (p = 0.164), although respondents aged above 20 years reported a slightly higher proportion of high usage, 166 (63.8%), compared to those below 20 years, 163 (57.0%). Sex (p = 0.226), ethnicity (p = 0.551), and religion (p = 0.139) also did not show statistically significant associations. Faculty was, however, significantly associated with the extent of AI usage (p = 0.034), with high AI usage most prevalent in the Faculty of Pharmacy, 25 (86.2%), and Life Sciences, 81 (69.2%), while the Faculty of Arts recorded the highest proportion of moderate users, 98 (41.2%).

At the departmental level (p = 0.084), no statistically significant association was observed, although Pharmacy and AEB showed the highest frequency of high users at 25 (86.2%) and 50 (78.1%) respectively, while Chemistry demonstrated a more even distribution between moderate, 19 (47.5%), and high usage, 20 (50.0%).

Academic level was not significantly associated with the extent of AI usage (p = 0.308), with respondents in 400–600 levels reporting a slightly higher proportion of high usage, 107 (65.2%), compared to those in 100–300 levels, 222 (58.1%). Finally, place of residence did not significantly impact usage (p = 0.150), although off-campus residents reported a slightly higher proportion of high usage, 199 (63.2%), compared to on-campus residents, 130 (56.3%).

Table 14b: Association between respondents' socio-economic status and level of use of AI

Variables	Use of AI			Test statistic	p-value
	Low (n=17) Freq. (%)	Moderate (n=200) Freq. (%)	High (n=329) Freq. (%)		
Residence					
Off-campus	7 (2.2)	109 (34.6)	199 (63.2)	χ^2=3.787	0.150
On-campus	10 (4.3)	91 (39.4)	130 (56.3)		
Internet access					
Excellent	5 (3.0)	46 (27.2)	118 (69.8)	17.296+	**0.022***
Good	10 (3.5)	116 (41.1)	156 (55.3)		
Fair	1 (1.2)	33 (38.8)	51 (60.0)		
Poor	1 (11.1)	5 (55.6)	3 (33.3)		
No access	0 (0.0)	0 (0.0)	1 (100.0)		
Monthly allowance (₦)					
<70,000	15 (3.5)	174 (40.7)	239 (55.8)	χ^2=16.135	**<0.001**
≥ 70,000	2 (1.7)	26 (22.0)	90 (76.3)		a
Monthly data expenditure					
≤ 2,000	7 (8.0)	35 (40.2)	45 (51.7)	22.201+	**0.001***
2,001 – 5,000	6 (3.2)	83 (43.7)	101 (53.2)		
5,001 – 10,000	3 (2.1)	50 (35.2)	89 (62.7)		
> 10,000	1 (0.8)	32 (25.2)	94 (74.0)		
Disabilities/learning challenges					
Yes	1 (3.7)	9 (33.3)	17 (63.0)	χ^2=1.151	0.938
No	16 (3.1)	191 (36.8)	312 (60.1)		
Knowledge of AI					
Good	11 (3.4)	123 (38.1)	189 (58.5)	χ^2=1.1069	0.589
Poor	6 (2.7)	77 (34.5)	140 (62.8)		
Perception of AI					
Positive	6 (1.5)	127 (32.2)	261 (66.2)	χ^2=27.390	**<0.001***
Negative	11 (7.2)	73 (48.0)	68 (44.7)		

Statistically significant; +Fisher's exact Test.

Internet access was a highly significant factor (p=0.022), where those with excellent access reported the highest proportion of high usage, 118 (69.8%), while high usage was markedly lower for those with poor access. Monthly income also showed a

significant association with the extent of AI use ($p < 0.001$), as respondents earning above ₦70,000 reported a higher proportion of high usage, 90 (76.3%), compared to 239 (55.8%) among those earning below ₦70,000. Monthly data expenditure followed this trend ($p=0.001$), as the highest spenders reported the greatest frequency of high AI use, 94 (74.0%), compared to only 45 (51.7%) for those spending ₦2,000.

The perception of AI was also shown to have a significant association with the extent of AI usage ($p=0.001$), with a positive perception corresponding to high usage in 261 (66.2%) of cases, while those with a negative perception were more likely to report moderate use, 73 (48.0%), or high use at a much lower rate of 68 (44.7%). Conversely, knowledge of AI did not show a statistically significant association with the extent of use ($p=0.589$), with high usage remaining relatively consistent between those with good knowledge, 189 (58.5%), and poor knowledge, 140 (62.8%). Finally, the presence of disabilities or learning challenges was not significantly associated with usage levels ($p=0.938$), as 17 (63.0%) of those with challenges and 312 (60.1%) of those without reported high usage.

SECTION E

FACTORS INFLUENCING THE KNOWLEDGE AND USE OF ARTIFICIAL INTELLIGENCE AMONG RESPONDENTS

Table 15a: Factors influencing the knowledge, perception and use of AI among respondents

Variable	Frequency (n = 603)	Percent
Received formal coursework on AI		
Yes	220	36.5
No	383	63.5
Access to online platforms to learn about AI		
Yes	465	77.1
No	138	22.9
Peers' interest in AI motivates learning		
Yes	411	68.2
No	192	31.8
Lecturers supportive of interest in learning AI		
Yes	282	46.8
No	321	53.2
Main influence on knowledge of AI		
Academic and educational exposure	153	25.4
Nothing	98	16.3
Time and convenience	80	13.3
Personal interest and curiosity	75	12.4
Perceived usefulness and efficiency	61	10.1
Repeated use and practical engagement	41	6.8
Media and digital exposure	34	5.6
Internet and technological access	22	3.6
I don't know	18	3.0
Peer and social influence	12	2.0
Financial factors	7	1.2
No opinion	2	0.3
Encouraged by your lecturers or department to use AI tools		
Yes	272	45.1
No	331	54.9
Have access to AI platforms and tools necessary for practical use		
Yes	442	73.3
No	161	26.7
Can afford data costs for AI tools		
Yes	411	68.2
No	192	31.8

The findings show that 220 (36.5%) respondents have received formal coursework on AI, while 383 (63.5%) have not. Access to online platforms to learn about AI was reported by 465 (77.1%) respondents, compared to 138 (22.9%) who reported no access. Peer interest motivates learning for 411 (68.2%) individuals, while 192

(31.8%) stated it does not. Regarding faculty support, 282 (46.8%) respondents indicated their lecturers are supportive of their interest in learning AI, while 321 (53.2%) indicated they are not.

The main influences on knowledge of AI include academic and educational exposure for 153 (25.4%) respondents, followed by nothing for 98 (16.3%), time and convenience for 80 (13.3%), and personal interest and curiosity for 75 (12.4%). Other factors reported include perceived usefulness and efficiency at 61 (10.1%), repeated use and practical engagement at 41 (6.8%), media and digital exposure at 34 (5.6%), and internet and technological access at 22 (3.6%). Less frequent influences were I don't know at 18 (3.0%), peer and social influence at 12 (2.0%), financial factors at 7 (1.2%), and no opinion at 2 (0.3%).

Additionally, 272 (45.1%) respondents reported being encouraged by their lecturers or department to use AI tools, while 331 (54.9%) were not. Access to AI platforms and tools necessary for practical use was confirmed by 442 (73.3%) respondents, with 161 (26.7%) reporting no access. Finally, 411 (68.2%) respondents indicated they can afford data costs for AI tools, while 192 (31.8%) reported that they cannot.

Table 15b: Factors influencing the knowledge, perception, and use of AI

Main influence for use of AI	Frequency (n = 546)	Percent
Academic and educational demands	154	28.2
Availability of data and internet access	139	25.5
No opinion	80	14.7
Learning and knowledge needs	64	11.7
Perceived usefulness and performance	33	6.0
Ease of use and convenience	17	3.1
Personal motivation and interest	17	3.1
Media and platform exposure	13	2.4
Time-related factors	8	1.5
Accessibility of devices and technology	7	1.3
I don't know	7	1.3
Financial factors	4	0.7
Policy, ethics, and institutional factors	3	0.5

The main influence on the use of artificial intelligence among respondents was academic and educational demands 154 (28.2%), followed by availability of data and internet access 139(25.5%). A proportion of respondents indicated no opinion (80; 14.7%), while learning and knowledge needs 64 (11.7%) were also reported.

Other factors included perceived usefulness and performance 33(6.0%), ease of use and convenience 17 (3.1%), and personal motivation and interest 17(3.1%). Additionally, media and platform exposure 13(2.4%) and time-related factors 8(1.5%) were identified.

Less frequently reported influences were accessibility of devices and technology 7(1.3%), I don’t know 7(1.3%), financial factors 4 (0.7%), and policy, ethics, and institutional factors 3(0.5%).

Table 16: Factors influencing knowledge of Artificial intelligence among respondents

Variables	Knowledge of AI		Test statistic	p-value
	Good (n=340) Freq. (%)	Poor (n=263) Freq. (%)		
Received formal coursework on AI				
Yes	229 (59.8)	154 (40.2)	χ^2 =4.953	**0.027***
No	111 (50.5)	109 (49.5)		
Access to online platforms to learn about AI				
Yes	269 (57.8)	196 (42.2)	χ^2 =1.773	0.204
No	71 (51.4)	67 (48.6)		
Peers' interest in AI motivates learning				
Yes	248 (60.3)	163 (39.7)	χ^2 =8.214	**0.005***
No	92 (47.9)	200 (52.1)		
Lecturers supportive of interest in learning AI				
Yes	152 (53.9)	130 (46.1)	χ^2 =1.329	0.251
No	188 (58.6)	144 (41.4)		

Statistically significant

Receipt of formal coursework on AI was significantly associated with knowledge (p = 0.027), with higher good knowledge among those exposed, 229 (59.8%), compared to those without, 111 (50.5%). Similarly, peer interest significantly influenced knowledge (p = 0.005), with 248 (60.3%) of those motivated by peers having good knowledge versus 92 (47.9%) among those not motivated. Access to online platforms (p = 0.204) and lecturers' support (p = 0.251) were not significantly associated with knowledge.

Table 17: Predictors of knowledge among respondents

Variables	β (regression coefficient)	OR	95% C.I. for OR		p-value
			Lower	Upper	
Received formal coursework on AI					
Yes		1			
No	0.487	1.628	1.129	2.347	**0.009****
Access to online platforms to learn about AI					
Yes		1			
No	-0.274	0.761	0.510	1.135	0.181
Peers' interest in AI motivates learning					
Yes		1			
No	-0.634	0.531	0.366	0.769	**0.001****
Lecturers supportive of interest in learning AI					
Yes		1			
No	0.231	1.260	0.883	1.797	0.202

OR: Odds ratio; CI: Confidence interval; * Reference category; ** $p < 0.05$; $R^2 = 3.2 – 4.3\%$.

Respondents who had not received formal coursework on AI were more likely to have higher odds of knowledge compared to those who had (OR = 1.628, 95% CI: 1.129–2.347; p = 0.009). Similarly, respondents whose peers did not show interest in AI were less likely to have good knowledge compared to those whose peers were interested (OR = 0.531, 95% CI: 0.366–0.769; p = 0.001).

However, access to online platforms for learning about AI (OR = 0.761, 95% CI: 0.510–1.135; p = 0.181) and lecturers' support for learning AI (OR = 1.260, 95% CI: 0.883–1.797; p = 0.202) were not significantly associated with knowledge.

Table 18: Factors influencing perception of Artificial intelligence among respondents

Variables	Perception of AI		Test statistic	p-value
	Positive (n=427) Freq. (%)	Negative (n=176) Freq. (%)		
Received formal coursework on AI				
Yes	163 (74.1)	57 (25.9)	$\chi^2 = 1.801$	0.193
No	264 (68.9)	119 (31.1)		
Access to online platforms to learn about AI				
Yes	336 (72.3)	129 (27.7)	$\chi^2 = 2.054$	0.166
No	91 (65.9)	47 (34.1)		
Peers' interest in AI motivates learning				
Yes	297 (72.3)	114 (27.7)	$\chi^2 = 1.313$	0.290
No	130 (67.7)	62 (32.3)		
Lecturers supportive of interest in learning AI				
Yes	210 (74.5)	72 (25.5)	$\chi^2 = 3.425$	0.073
No	217 (67.6)	104 (32.4)		

None of the assessed factors were significantly associated with perception of AI. Positive perception was slightly higher among those with formal coursework, 163 (74.1%), access to online platforms, 336 (72.3%), peer motivation, 297 (72.3%), and lecturer support, 210 (74.5%), but these differences were not statistically significant ($p>0.05$).

Table 19: Predictors of perception among respondents

Variables	β (regression coefficient)	OR	95% C.I. for OR		p-value
			Lower	Upper	
Received formal coursework on AI					
Yes		1			
No	-0.117	0.890	0.597	1.327	0.567
Access to online platforms to learn about AI					
Yes		1			
No	-0.213	0.808	0.530	1.232	0.323
Peers' interest in AI motivates learning					
Yes		1			
No	-0.086	0.917	0.619	1.360	0.668
Lecturers supportive of interest in learning AI					
Yes		1			
No	-0.254	0.776	0.529	1.138	0.194

OR: Odds ratio; CI: Confidence interval; * Reference category; ** p < 0.05; R^2 = 0.9 – 1.3%.

None of the predictors reached statistical significance. Receipt of formal coursework on AI (OR = 0.890, 95% CI: 0.597–1.327, p = 0.567) was not associated with AI use. Similarly, access to online platforms (OR = 0.808, 95% CI: 0.530–1.232, p = 0.323), peers' influence (OR = 0.917, 95% CI: 0.619–1.360, p = 0.668), and lecturers' support (OR = 0.776, 95% CI: 0.529–1.138, p = 0.194) were not statistically significant predictors.

Table 20: Factors influencing use of Artificial intelligence among

Variables	Use of AI		Test statistic	p-value
	Yes (n=546) Freq. (%)	No (n=57) Freq. (%)		
Received formal coursework on AI				
Yes	202 (91.8)	18 (8.2)	$\chi^2 = 0.654$	0.471
No	344 (89.8)	39 (10.2)		
Access to online platforms to learn about AI				
Yes	430 (92.5)	35 (7.5)	$\chi^2 = 8.805$	**0.005***
No	116 (84.1)	22 (15.9)		
Peers' interest in AI motivates learning				
Yes	385 (93.7)	26 (6.3)	$\chi^2 = 14.743$	**<0.001***
No	161 (83.9)	31 (16.1)		
Lecturers supportive of interest in learning AI				
Yes	264 (93.6)	18 (6.4)	$\chi^2 = 5.832$	**0.018***
No	282 (87.9)	39 (12.1)		

Statistically significant

Access to online platforms (p = 0.005), peer motivation (p < 0.001), and lecturers' support (p = 0.018) were significantly associated with AI use. Higher usage was observed among those with access, 430 (92.5%), those motivated by peers, 385 (93.7%), and those with lecturer support, 264 (93.6%). Receipt of formal coursework was not significantly associated with AI use (p = 0.471), although usage remained high among both groups.

Table 21: Predictors of use among respondents

Variables	β (regression coefficient)	OR	95% C.I. for OR		p-value
			Lower	Upper	
Received formal coursework on AI					
Yes		1			
No	0.245	1.278	0.668	2.445	0.458
Access to online platforms to learn about AI					
Yes		1			
No	-0.640	0.528	0.289	0.963	**0.037****
Peers' interest in AI motivates learning					
Yes		1			
No	-0.860	0.423	0.235	0.763	**0.004****
Lecturers supportive of interest in learning AI					
Yes		1			
No	-0.477	0.620	0.327	1.176	0.143

OR: Odds ratio; CI: Confidence interval; * Reference category; ** $p < 0.05$; $R^2 = 3.3 – 7.2\%$.

Access to online platforms (OR = 0.528, 95% CI: 0.289–0.963, p = 0.037) and peers' interest in AI (OR = 0.423, 95% CI: 0.235–0.763, p = 0.004) were significant predictors of AI use. Other variables were not statistically significant predictors (p > 0.05).

CHAPTER FIVE

DISCUSSION

This study assessed the knowledge, perception and use of artificial intelligence among undergraduate students of the University of Benin, Benin City, as well as the factors that influence these outcomes. The discussion that follows interprets the major findings in relation to the study objectives and existing literature, while also considering the local educational, technological and socio-cultural context in which students engage with AI tools. Particular attention is given to the level of AI literacy among students, their perception towards AI in learning, the extent to which these technologies have been incorporated into academic routines, and the demographic and institutional factors that shape these patterns. Overall, the discussion aims to place the findings within the broader discourse on AI integration in Nigerian higher education and to highlight their implications for curriculum development, policy formulation and equitable access to digital learning resources.

The mean age of respondents was 19.9 ± 2.87 years, with most respondents being younger than 20 years. A study conducted at UNIBEN reported a mean age of 20.1 ± 2.5 years, which is comparable to the finding in the present study.[47] This age distribution is typical for undergraduate students in Nigerian universities, where most students gain admission shortly after completing secondary education. Females constituted a greater proportion of the sample. This female predominance is consistent with several Nigerian studies. A study at UNIBEN reported a similar pattern, while other studies across multiple institutions also documented a higher proportion of female respondents.[18,32,47] The observed female predominance in this study may be related to the faculty distribution, as Arts and Life Sciences traditionally female-

dominated disciplines made up a substantial portion of the sample. The majority of respondents were Christians, which reflects the religious demography of the South-South geopolitical zone of Nigeria. This finding is consistent with previous studies that also reported Christianity as the predominant religion among respondents.[18] Ethnically, Benin and Esan groups were the most represented, reflecting the location of the university in Benin City, Edo State, and its attraction to local indigenes. This pattern is similar to findings from previous studies conducted at the same institution.[47] However, the presence of Igbo, Yoruba, and other ethnic groups highlights the institution's national character. Faculty distribution showed that Arts had the largest representation, followed by Life Sciences and Physical Sciences, while Medicine and Pharmacy accounted for a smaller proportion, consistent with their relatively lower enrolment sizes. This pattern is comparable to findings from a previous study at UNIBEN.[47] Most respondents lived off-campus, reflecting the limited availability of on-campus accommodation. Similar patterns have been reported in studies conducted at UNIBEN, while other studies in Nigerian universities have documented even higher rates of off-campus residence, underscoring the persistent challenge of inadequate hostel facilities.[18, 47]

For socioeconomic indicators, the mean monthly allowance was ₦61,562.35 (±103,848.73). This is higher than values reported in earlier studies, where students' monthly allowances were generally lower.[17, 18] The higher allowance observed in the present study may reflect inflation and the increasing cost of living in Benin City. Monthly data expenditure averaged ₦9,515.77 (±11,206.25). Most respondents reported no disabilities or learning challenges. Device ownership was dominated by smartphones, with relatively few respondents owning laptops. This pattern is consistent with findings from Nigerian tertiary institutions, where smartphones are the

primary digital devices due to their affordability and portability.[17, 32] Internet access was generally rated as good or excellent by most respondents, indicating reasonable connectivity, although a smaller proportion reported fair or poor access. This is in contrast to a multi-institutional study where less than half of the students reported good internet access. This better connectivity in this present study may reflect the urban location of Univeristy of Benin in Benin City, a major city with relatively better telecommunication infrastructure.[32]

The study revealed that a little over half of respondents demonstrated good knowledge of artificial intelligence, indicating a relatively satisfactory level of AI literacy among University of Benin students. This is in contrast to a cross-sectional study carried out in 2023 among undergraduate students at Nnamdi Azikiwe University, Nigeria, where only less than a quarter claimed high or very high knowledge of AI.[18] Globally, the findings are comparable with a multinational cross-sectional survey in Saudi Arabia, Malaysia, India, and Egypt which showed varying levels of AI knowledge with majority of Malaysian students showing high proficiency while less than two-fifth of Egyptian students showed high proficiency.[30] This study found that knowledge of AI was significantly associated with sex, faculty, and access to digital resources such as internet connectivity and smart devices. Female students demonstrated higher levels of knowledge compared to males. This finding may reflect increasing female engagement in digital learning and academic activities. Faculty-based differences were also evident, with students in science- and health-related disciplines showing better knowledge compared to those in non-technical fields. This finding is similar with studies from Germany and multinational settings, which reported significantly higher AI literacy among students in technical disciplines due to greater academic exposure and curriculum integration.[29, 30] Additionally, students with better internet

access and frequent use of digital tools were more likely to have good knowledge, highlighting the role of technological exposure in shaping understanding. The study also revealed that sex, faculty, and level of access to digital infrastructure remained significant independent predictors of good knowledge of AI. This suggests that beyond simple associations, these factors play a direct role in determining students' AI literacy. The persistence of faculty as a predictor underscores the importance of curriculum integration, while the role of digital access reflects the ongoing impact of the digital divide in developing countries. These findings imply that improving AI knowledge among students will require targeted interventions such as curriculum integration across all faculties, as well as improved access to digital infrastructure. Without addressing these predictors, disparities in AI knowledge may persist across different student groups.

Several factors may account for the observed levels of AI knowledge. The University of Benin's institutional commitment to AI, evident in the availability of specialised courses, internships, and the CAID centre, likely plays a central role in enhancing AI literacy across faculties. In addition, the widespread access to smartphones and the internet facilitates informal learning, enabling students to engage with AI tools and digital content independently. However, such exposure often emphasizes usage rather than conceptual understanding, which may explain the disparity between high awareness of AI applications and lower technical knowledge. The observed higher likelihood of good knowledge among female students may reflect changing trends in academic engagement and digital literacy. However, this finding may also be influenced by contextual factors such as faculty distribution or differential access to learning resources, and should therefore be interpreted cautiously. Internet access also plays a crucial role. Students with better connectivity are more likely to access online

learning resources, tutorials, and AI tools, highlighting the importance of digital infrastructure in shaping knowledge acquisition. In the Nigerian context, where internet access is variable, this contributes to inequalities in AI literacy. Variations in knowledge across faculties appear to reflect differences in curricular exposure, with medical students more frequently encountering AI in diagnostic and research contexts, while students in the arts have fewer structured opportunities for engagement. In addition, the progressive increase in knowledge with advancing academic level suggests cumulative learning through research activities, coursework, and peer interactions. Finally, the low level of awareness of AI ethics likely reflects the absence of structured teaching in this area. Informal learning sources, particularly social media and online platforms, tend to emphasize the benefits of AI while underrepresenting ethical concerns such as bias, privacy, and accountability.

Knowledge of AI has direct public health implications. AI is increasingly being integrated into healthcare systems for applications such as disease surveillance, diagnostic imaging, epidemic prediction, and health information management. Adequate knowledge of AI among future healthcare professionals is essential to ensure effective and responsible use of these technologies. Conversely, insufficient knowledge may lead to underutilization of beneficial AI tools or inappropriate reliance on AI outputs without critical evaluation, potentially compromising patient care. Furthermore, limited awareness of ethical issues such as algorithmic bias and data privacy may expose patients to risks, particularly in settings with already vulnerable health systems.

Beyond healthcare, AI literacy among students across all disciplines, including arts, management, and social sciences, is essential for addressing the broader societal and policy challenges associated with AI, including equitable access, regulation, and

ethical governance. The finding that a substantial proportion of students have poor knowledge highlights a potential workforce preparedness gap that could hinder Nigeria's ability to fully leverage AI for development.

To address the gaps identified in this study, a comprehensive and multidisciplinary approach is required. Universities should integrate mandatory AI literacy modules into undergraduate curricula across all faculties, covering foundational concepts, practical applications, and ethical considerations. This will ensure that all students, regardless of discipline, acquire basic AI competencies. There is also a need for faculty capacity development, enabling lecturers to incorporate AI-related content into their teaching and guide students in the responsible use of AI tools. In addition, institutions should promote practical learning opportunities, such as workshops, internships, and student-led AI initiatives, to bridge the gap between theoretical knowledge and real-world application. Improving digital infrastructure is equally important. Universities should enhance internet access on campus and explore strategies to support off-campus students, such as subsidized data plans or virtual learning platforms, in order to reduce disparities in access to AI resources. Finally, targeted efforts should be made to strengthen AI ethics education, ensuring that students are equipped not only with technical knowledge but also with the critical skills required to evaluate and use AI responsibly.

The study found that more than two-thirds of the respondents held a positive perception of artificial intelligence, reflecting general acceptance of AI as a beneficial tool in education. This finding is similar to a cross-sectional study conducted in 2023 in Hong Kong to analyze university students' perceptions of generative AI (GenAI) technologies, such as ChatGPT, where majority had positive perceptions of AI in education.[33] Similarly in a cross-sectional study conducted in North Central Nigeria

among education students, three-fifth believed AI could improve personalised learning, which is consistent with the finding where majority agreed AI addresses diverse learning styles.[10] Perception of AI was significantly associated with factors such as prior exposure to AI tools, level of knowledge, faculty, and training experience. Students who had previously used AI tools or received some form of training were more likely to have a positive perception. Similarly, students with good knowledge of AI tended to view it more favourably, suggesting a strong link between understanding and acceptance. Faculty differences were also observed, with students in more technologically inclined disciplines expressing more positive perceptions compared to their counterparts in non-technical fields. Knowledge level, prior AI use, and exposure to training were also found to be significant independent predictors of positive perception. This indicates that perception is not merely influenced by demographic characteristics but is strongly shaped by experience and familiarity with AI technologies. In particular, knowledge emerged as a key predictor, reinforcing the idea that improving AI literacy can directly enhance students' attitudes toward its use.

The predominantly positive perception can be attributed to the increasing availability of free AI tools such as ChatGPT, Gemini, and Grammarly which students frequently use for academic tasks. Regularly interaction with these tools allows students to experience their practical benefits including improved efficiency, better understanding of complex concepts, and enhanced academic output, thereby reinforcing positive perception. The strong association between extent of AI use and positive perception supports the Technology Acceptance Model (TAM), which posits that perceived usefulness and ease of use influence attitudes toward technology. Students who use AI more frequently are likely to perceive it as both useful and easy to use, leading to more favourable perceptions. The relatively moderate level of trust in AI accuracy

may reflect students' real-world experiences with AI limitations, such as incorrect or misleading outputs. This suggests that students are not only users of AI but are also developing a level of critical awareness regarding its reliability. An important finding in this study is that female students were less likely to have positive perceptions despite demonstrating better knowledge. This may indicate a knowledge–perception gap, where greater understanding of AI is associated with increased awareness of its limitations and risks, leading to more cautious attitudes. Alternatively, this finding may reflect differences in risk perception, ethical concerns, or experiences with AI tools, and warrants further investigation. Differences across departments, particularly the higher likelihood of positive perception among students in the Chemistry department, may be explained by greater exposure to AI applications in areas such as data analysis, modelling, and research. Students who can directly relate AI to their field of study are more likely to perceive it as relevant and beneficial. The finding that students with good internet access had less positive perception compared to those with excellent access may reflect the impact of user experience. Students with suboptimal connectivity may encounter challenges such as slow response times, interruptions, or data limitations when using AI tools, leading to frustration and less favourable attitudes. In contrast, those with seamless access are more likely to have positive experiences that reinforce favourable perceptions.

Students' perceptions of AI have significant implications for its adoption in healthcare and public health. Positive perceptions can facilitate the integration of AI into clinical practice, medical education, and public health interventions, including disease surveillance, diagnostic support, and health communication. Future healthcare professionals who view AI favourably are more likely to adopt and effectively use these technologies. However, overly positive perceptions without adequate critical

understanding may lead to over-reliance on AI, potentially undermining clinical judgment and increasing the risk of errors. Conversely, negative or skeptical perceptions may result in resistance to adopting beneficial technologies, limiting their impact. The observed combination of generally positive perception with some degree of caution suggests an opportunity to promote balanced AI literacy, where students are encouraged to appreciate the benefits of AI while remaining critically aware of its limitations. This is particularly important in the Nigerian healthcare context, where resource constraints may amplify the consequences of both misuse and underutilization of AI technologies.

To build on the generally positive perception observed in this study, universities should promote structured AI education that integrates both technical knowledge and ethical awareness. This includes incorporating discussions on AI limitations, bias, data privacy, and responsible use into existing curricula. Institutions should also encourage guided and responsible use of AI tools, with lecturers serving as role models by demonstrating appropriate applications of AI in academic work. This can help shape students' perceptions and reduce fears related to misuse or replacement. Given the strong influence of usage on perception, universities should provide opportunities for practical engagement, such as workshops, seminars, and student-led initiatives, to enhance familiarity and confidence in using AI tools. Addressing infrastructural barriers is equally important. Improving internet access and affordability will ensure that students can interact with AI tools effectively, thereby enhancing their experience and perception. Finally, institutions should establish mechanisms for continuous monitoring of student perceptions, allowing emerging concerns such as misinformation, academic integrity, and job displacement to be identified and addressed proactively.

The findings in this study revealed that the use of AI-driven learning platforms among students of University of Benin were remarkably high, with nine out of ten of respondents reporting active use of AI-driven learning platforms. Among these, over half of the students demonstrated high usage, approximately one-third reported moderate usage, and only a small fraction exhibited low usage.

The most commonly used AI tool was ChatGPT, alongside other platforms such as Gemini, Duolingo, and Grammarly. The use of these tools was largely concentrated on basic academic activities, including explanations of difficult concepts, writing assistance, summarization, and idea generation.

AI tools were utilized across a wide range of courses with usage more concentrated in certain subject areas and over half of respondents applying AI to general studies and theory-based courses, while approximately one-third used AI in discipline-specific courses. Only a small fraction reported using AI in highly technical, practical, or calculation-intensive courses.

These findings suggest that although AI use is widespread, it is predominantly applied to courses requiring reading, writing, and conceptual understanding, rather than those demanding advanced analytical or technical skills.

The study also revealed that the use of AI was significantly associated with key socio-economic factors, particularly internet access and monthly allowance. Students with consistent internet access constituted over half of high AI users, whereas those with limited access formed a larger proportion of moderate to low users.

Similarly, students with higher monthly allowances, representing approximately half of respondents, were more likely to demonstrate high AI usage, compared to those with lower financial resources.

On multivariate analysis, these associations remained significant, indicating that internet access and financial capacity are independent predictors of AI use. This suggests that roughly two-fifths to one-half of the variation in AI usage can be explained by differences in access to resources.

The widespread use of AI can be attributed to the ease of access and user-friendly nature of AI tools, particularly mobile-based platforms.

The pattern of course-specific usage observed where over half of students use AI in theory-based courses and only about one-third in core courses may be explained by the functional strengths of current AI tools, which are better suited for text generation, summarization and explanation of concepts rather than for numerical problem-solving, practical skills, or laboratory-based learning.

Furthermore, the fact that only half of students demonstrated high-level use, while nearly one-third remained at a moderate level, suggests limited depth of engagement. This may be due to lack of formal training in advanced AI applications, limited awareness of discipline-specific AI tools and absence of structured academic guidance on AI use.

In addition, disparities in internet access and financial capacity, affecting approximately two-fifths to one-half of students, may further influence both the extent and type of AI usage. The strong association between internet access and AI use is expected, as most AI tools require stable and continuous connectivity. Students without reliable internet may face limitations in both frequency and depth of use. The influence of monthly allowance reflects the cost implications of data subscriptions, premium AI tools and device accessibility. Students with greater financial resources are therefore better positioned to explore and utilize AI tools extensively.

The persistence of these factors on multivariate analysis indicates that they are not merely confounders but true determinants of AI utilization, reinforcing the role of structural and economic factors.

The findings of this study showed that nine out of ten respondents reported using AI tools, indicating a very high level of use. This is markedly higher than findings from studies conducted in Nigeria.

A descriptive cross-sectional study conducted in South-West Nigeria reported that only about 21% of students consistently used AI tools, while another study across federal universities found that only 28% of students had ever used AI technologies.[45,46] Similarly, a study in Anambra State reported that only about 30% of students actively used AI for academic purposes.[6] This contrast suggests a rapid increase in AI adoption among university students, likely driven by the recent emergence and widespread availability of generative AI tools such as ChatGPT.

The findings of this study are, however, consistent with global trends. A cross-sectional study conducted across 50 countries reported that about 75% of students had used AI tools, primarily for brainstorming, summarization, and content refinement.[4] Similarly, studies conducted in Malaysia and Vietnam reported AI usage rates of 60% and 80% respectively, although most usage was limited to basic academic tasks.[40,41]

Furthermore, the pattern observed in this study, where AI is predominantly used for writing and conceptual tasks, aligns with findings from studies in Europe and the United States, which also reported that students mainly use AI for writing assistance, translation, and simplification of complex topics, with limited understanding of how the tools function.[7,38]

Overall, while the high level of AI use observed in this study exceeds that reported in earlier Nigerian studies, the pattern of predominantly basic and theory-focused usage in about half to two-thirds of students remains consistent with global trends. This highlights a persistent gap between AI availability and advanced, discipline-specific utilization.

The finding reflects a major shift in learning practices, with significant implications for both education and healthcare systems.

The high level of AI usage among students presents both opportunities and risks. On one hand, AI tools can enhance learning efficiency, access to information and research productivity. On the other hand, uninformed or uncritical use of AI may lead misinformation, reduced critical thinking and over-reliance on automated systems.

Artificial Intelligence has also been increasingly recognized as a tool for improving medical education, clinical decision-making, and healthcare delivery. However, the present study shows that about half to two-thirds of students primarily use AI for basic academic tasks, and that AI application is concentrated in theory-based courses. This pattern raises concerns about superficial learning and over-reliance on AI tools.

Excessive dependence on AI recommendations can reduce independent critical thinking and decision-making accuracy, particularly when users do not critically evaluate AI outputs.

Furthermore, this study identified that approximately two-fifths to half of students are affected by access-related factors, including internet availability and financial capacity. This reflects a digital divide, which has important implications for equity. Unequal access to digital technologies can lead to widening disparities in health

knowledge, skills, and service delivery, particularly in low- and middle-income countries.

In the context of healthcare training, although nine out of ten students are already engaging with AI, the fact that up to half experience limitations in access or depth of use may result in unequal preparedness for AI-integrated healthcare systems. If unaddressed, this disparity could translate into variations in clinical competence, unequal adoption of AI in medical practice and broader inequities in healthcare delivery.

Therefore, while the widespread use of AI represents a significant opportunity for improving education and healthcare outcomes, ensuring equitable access, proper training, and critical use of AI is essential to prevent widening gaps in health workforce capacity and service delivery.

For these reasons, the university should design interventions targeting the one-third of students who use AI only at a moderate level, to improve depth of engagement.

Training programs should encourage students to extend AI use beyond theory-based courses to core and technical subjects, where currently only about one-third or fewer students apply AI.

Faculties should introduce discipline-specific AI tools and applications to bridge the gap between theoretical and practical usage.

Efforts should be made to support the two-fifths to half of students affected by limited access to internet and resources, ensuring equitable AI utilization.

Students should be guided to use AI as a complement not a replacement for practical and analytical learning, particularly in technical and professional courses.

This study identified several individual and institutional factors influencing the knowledge, perception, and use of artificial intelligence (AI) among undergraduate students.

At the descriptive level, a relatively small proportion of respondents (about two-fifths) reported having received formal coursework on AI, while a much larger proportion (about three-quarters) had access to online learning platforms and about two-thirds reported peer influence as a motivating factor. However, institutional support appeared suboptimal, with slightly more than half indicating lack of lecturer support.

From the bivariate analysis, receipt of formal AI coursework and peer influence were significantly associated with good knowledge of AI. Students exposed to formal coursework had a higher proportion of good knowledge (about three-fifths) compared to those without exposure (just above half). Similarly, students motivated by peers demonstrated better knowledge (about three-fifths) than those without peer influence (just under half). In contrast, access to online platforms and lecturer support were not significantly associated with knowledge of AI.

In the multivariate analysis, the significant predictors of knowledge were lack of formal AI coursework and lack of peer motivation. This indicates that students without formal training were about one and a half times more likely to have poor knowledge, while absence of peer influence significantly reduced the likelihood of good knowledge.

Additionally, perception was found to significantly influence AI usage, with positive perception associated with higher usage levels. However, knowledge of AI was not significantly associated with usage, suggesting that knowledge alone does not necessarily translate into utilization.

The strong influence of formal coursework on knowledge is expected, as structured education provides foundational understanding, technical exposure, and guided learning, which informal sources may not adequately offer. The relatively low proportion of students exposed to formal AI training in this study likely contributes to gaps in knowledge observed among respondents.

The significant role of peer influence highlights the importance of social learning in university settings. Students often learn through collaboration, shared resources, and peer discussions, especially in technology-related fields where informal knowledge exchange is common.

Interestingly, access to online platforms was not a significant predictor, despite high availability. This may be due to passive access without active engagement, lack of guidance on how to effectively use these platforms, or limited digital literacy skills needed to translate access into meaningful learning.

The lack of association between knowledge and usage suggests that students may use AI tools (e.g., for assignments or summaries) without fully understanding their underlying mechanisms. This reflects a pattern of superficial or utilitarian use rather than informed or critical engagement.

Finally, the significant association between perception and usage indicates that students' attitudes, beliefs, and trust in AI play a crucial role in determining whether they adopt these technologies, consistent with behavioural theories such as the Technology Acceptance Model.

The findings in this study are consistent with a cross-sectional study conducted across five Arab countries (Egypt, Iraq, Jordan, Kuwait, and Lebanon) in 2023 to sample a total of 2240 university students using a structured questionnaire based on the

Technology Acceptance Model Extension found that perceived usefulness, ease of use, and social influence significantly predicted AI adoption.[48] This aligns with the present study where peer influence significantly affected knowledge and perception influenced usage.

Similarly, a cross-sectional study conducted at King Faial University, Saudi Arabia in 2024 among 262 university students using self-administered questionnaires reported that perceived ease of use and collaborative learning (peer interaction) were strong predictors of AI adoption and learning satisfaction.[52] This supports the significant role of peer motivation observed in this study.

In addition, a cross-sectional study conducted in South Africa in 2025 at the University of the Witwatersrand among undergraduate and postgraduate students found that AI adoption was influenced by perceived usefulness, prior knowledge, and self-efficacy.[53] This is comparable to the current study where perception (a proxy for perceived usefulness) significantly influenced usage.

Furthermore, a descriptive cross-sectional study conducted among Nigerian polytechnic students identified performance expectancy, effort expectancy, and facilitating conditions (e.g., infrastructure and support) as key determinants of AI adoption.[54] This supports the observed role of institutional and environmental factors, although lecturer support was not significant in the present study.

However, the finding that access to online platforms was not significant contrasts with some studies which report digital access as a major determinant of AI adoption. This discrepancy may reflect contextual differences, particularly in Nigeria where access does not necessarily equate to effective utilization due to cost of data, inconsistent internet, or lack of structured guidance.

The findings of this study have important public health and educational implications. AI literacy is increasingly recognized as a critical component of digital health competence and workforce preparedness. Poor knowledge and suboptimal use of AI among university students may translate into a workforce that is inadequately prepared to leverage AI in healthcare, research, and public health systems.

In low and middle-income countries like Nigeria, where healthcare systems already face significant challenges, failure to integrate AI competencies into training may widen the global digital divide and limit the ability to adopt innovations such as AI-assisted diagnostics, predictive analytics, and health system optimization.

Moreover, the strong influence of perception on usage suggests that misconceptions, fear of AI, and ethical concerns could hinder adoption, thereby limiting the potential benefits of AI in improving health outcomes, education quality, and research productivity.

Addressing these gaps is essential not only for academic performance but also for broader societal development, as AI is increasingly embedded in healthcare delivery, epidemiological surveillance, and health education.

Therefore, universities should incorporate structured AI courses across all disciplines to improve formal exposure and knowledge acquisition. Peer-led learning initiatives like student-led AI clubs, study groups, and collaborative platforms should be encouraged to harness the strong influence of peer learning, and training programs should be implemented to equip lecturers with AI knowledge and skills, enabling them to support students effectively. There should be structured guidance on how to effectively utilize online AI learning resources, awareness and perception-focused interventions by creating workshops and seminars to address misconceptions, ethical

concerns, and promote responsible AI use to improve perception and adoption. Infrastructure and policy support by improving access to affordable internet, AI tools, and institutional policies on AI use will facilitate adoption and effective utilization.

CONCLUSION

More than half of students demonstrated good knowledge of artificial intelligence. Female students, medical students, and students in higher academic levels showed significantly better knowledge.

The majority of students held positive perceptions of AI, recognizing its usefulness for learning, motivation, and academic outcomes. Students with high AI usage and excellent internet access had the most positive perceptions.

This study demonstrated that the use of Artificial Intelligence (AI) among University of Benin students is remarkably high, with the vast majority of respondents actively utilizing AI-driven tools for academic purposes.

Furthermore, the study identified several key factors influencing the knowledge, perception and use of AI. Knowledge of AI was significantly influenced by formal AI coursework, peer interest, and academic level. Perception of AI was associated with AI use and internet access at the bivariate level but had no independent predictors. Use of AI was significantly influenced by access to online learning platforms and peer interest.

RECOMMENDATIONS

To National Universities Commission, Educational Policymakers, and Professional Regulators

1. Develop and implement national policies that mandate the integration of foundational artificial intelligence education across all university disciplines to address widespread knowledge gaps.
2. Provide targeted funding and institutional support to reduce disparities in AI education across faculties and institutions.
3. Promote gender-inclusive policies and initiatives that encourage equitable participation in digital and AI-related education.
4. Invest in digital infrastructure, including affordable internet access and institutional technologies, to support effective AI learning.
5. The NUC should develop and implement national guidelines for AI integration into university curricula across all disciplines.
6. Policies should be established to ensure standardization of AI education and ethical usage in Nigerian universities.
7. The NUC should promote capacity building initiatives, including funding for AI training, research, and infrastructure development.
8. Accreditation requirements should include evidence of AI literacy and digital competency training within academic programs.

9. Government and relevant stakeholders should invest in digital infrastructure development, particularly in improving internet accessibility and affordability for students.
10. Policies should address the digital divide, ensuring equitable access to emerging technologies across different socio-economic groups.

To University Management

1. The university should integrate AI education into institutional policy and strategic planning, recognizing its growing importance in education and professional practice.
2. Investment should be made in digital infrastructure, including improved campus-wide internet access and reliable power supply, to support AI utilization.
3. The university should provide institution-wide access to licensed AI tools and platforms to ensure equitable opportunities for all students.
4. Regular training programs, workshops, and seminars should be organized to enhance AI literacy across all faculties.

To Faculties and Academic Departments

1. Integrate structured and introductory artificial intelligence content into curricula across all faculties to address the identified gaps in students' foundational knowledge.

2. Develop targeted academic support strategies for faculties with comparatively lower levels of AI knowledge to reduce inter-faculty disparities.
3. Promote inclusive learning environments and digital training opportunities that address observed gender differences in AI knowledge and engagement.
4. Strengthen access to digital infrastructure, including reliable internet and institutional learning platforms, to translate positive perception of AI into practical competence.
5. Incorporate interdisciplinary and application-based learning approaches that leverage students' positive perception of AI to enhance engagement and problem-solving skills.
6. Departments should emphasize practical, discipline-specific applications of AI, rather than limiting exposure to general use.
7. Academic staff should be trained to guide students on ethical and effective AI usage, including issues of academic integrity.
8. Continuous assessment methods should be adapted to account for AI-assisted learning, ensuring that critical thinking and originality are maintained.

To University Lecturers

1. Incorporate basic artificial intelligence concepts into teaching across disciplines to improve students' overall knowledge levels.
2. Provide additional guidance and support to students from faculties with lower exposure to AI to reduce knowledge disparities.

3. Adopt inclusive teaching strategies that encourage equal participation and confidence among both male and female students in AI-related learning.
4. Utilize practical demonstrations and real-life examples to convert students' positive perception of AI into meaningful understanding and application.
5. Encourage the use of accessible digital tools and platforms in teaching to reinforce learning, especially among students with varying levels of internet access.

To Students

1. Actively pursue foundational knowledge of artificial intelligence through accessible learning resources to address existing gaps in understanding.
2. Utilize available digital tools and internet resources to build practical skills in AI, particularly where institutional exposure is limited.
3. Engage in interdisciplinary learning and collaboration to broaden understanding of AI applications across different fields.
4. Develop critical thinking skills to evaluate the reliability, limitations, and ethical implications of AI despite generally positive perceptions.
5. Encourage inclusive peer learning and collaboration to help reduce observed disparities in AI knowledge and engagement.
6. Students should strive to move beyond basic use of AI tools and develop advanced competencies relevant to their fields of study.

7. AI should be used as a support tool rather than a substitute for critical thinking and independent learning.
8. Students should familiarize themselves with the ethical implications and limitations of AI, including issues of bias and misinformation.
9. Peer-led learning and collaboration should be encouraged to enhance responsible and effective AI use.

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APPENDIX I

INFORMED CONSENT FORM

TITLE OF STUDY

Knowledge, Perception and Use of Artificial Intelligence among Students of University of Benin, Benin City.

INSTITUTION

Department of Public Health and Community Medicine, College of Medical Sciences, University of Benin, Benin City.

PRINCIPAL INVESTIGATORS

Promise Tolulope Agbonidia

Osarumwense Aibangbee

SUPERVISOR

Prof. Vivian Omuemu

FINANCIAL SPONSORSHIP

This research work is financially sponsored by the principal investigators.

PURPOSE OF RESEARCH

The purpose of this research work is to assess the knowledge, perception and use of Artificial Intelligence among University of Benin Students, with a view to integrate AI into the curriculum.

PROCEDURES

If respondents agree to participate, they will receive a Google Form containing a questionnaire. This questionnaire will enable us assess the knowledge, perception and use of AI among University of Benin students.

CONFIDENTIALITY

All information collected would be kept confidential and stored securely. Data collected would he anonymized and only accessible to the research team.

COMPENSATION

Participants will not receive any compensation for their participation.

VOLUNTARY PARTICIPATION

Your participation in this study is voluntary. You may withdraw from the study at any time without any consequences.

BENEFITS

Participants will contribute to important research that may help improve the curriculum, promote awareness, shape university policy, on the adoption of Artificial intelligence.

RISKS

There are no risks associated with participation in this study.

CONTACT INFORMATION

If you have any questions or concerns regarding this research work please contact:

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OR

Ethics and Research Committee,

University of Benin Teaching Hospital,

Benin City.

Email: ubthresearchethics@gmail.com

Phone number: 07063331337

IF THERE IS ANY PORTION OF THIS CONSENT AGREEMENT THAT YOU DO NOT UNDERSTAND, ASK THE FIELD WORKER OR INVESTIGATOR BEFORE SIGNING.

Please, sign below if you have agreed to participate in the study.

CERTIFICATION OF CONSENT

I,_____ having full capacity to consent for myself do thereby consent to my participation in the research study.

The methods and means by which the study will be conducted have been explained to me by Ethical Committee. I have been given the opportunity to ask questions concerning this investigational study, and any such questions have been answered to my full and complete satisfaction.

I understand that I may at any time during the course of this study revoke this consent and withdraw myself from the study without prejudice.

Participant's Signature:_____

Date:_____

APPENDIX II

QUESTIONNAIRE ON KNOWLEDGE, PERCEPTION AND USE OF ARTIFICIAL INTELLIGENCE AMONG STUDENTS OF UNIVERSITY OF BENIN

Consent and Introduction

Dear Participant, we are 600 level students of Medicine and Surgery at the University of Benin, conducting a study on "Knowledge, perception and use of artificial intelligence among University Students in Benin City." The aim is to explore how students interact with artificial intelligence in academic contexts. This questionnaire will serve as a tool for data collection in this research. Your sincere response will be helpful and the information given here will be appreciated and treated with confidentiality.

SECTION A: Demographic Characteristics of Respondent

1. Age as at last birthday (years): _____

2. Gender: [ ] Male [ ] Female [ ]

3. Religion: Christian [ ] Islam [ ] ATR [ ] Others (specify) _____

4. Ethnicity: Benin [ ] Esan [ ] Owan [ ] Igbo [ ] Yoruba [ ] Hausa [ ] Others (specify) _____

5. Level of Study: [ ] 100 Level [ ] 200 Level [ ] 300 Level [ ] 400 Level [ ] 500 Level [ ] 600 level

6. Faculty: _____

7. Department: _____

6. Place of residence: [ ] On-campus [ ] Off-campus

Socioeconomic Status:

1. Devices Owned: [ ] Smartphone [ ] Laptop [ ] Tablet [ ] Desktop Computer

2. How would you rate your internet access? [ ] Excellent [ ] Good [ ] Fair [ ] Poor [ ] No access

3. How much is your monthly allowance? _____

4. Monthly data expenditure for learning purposes: _____

5. Do you have any disabilities or learning challenges? [ ] Yes: _____ [ ] No

SECTION B: Knowledge of AI

Please select the option that best reflect your understanding and knowledge of AI. For multiple-choice questions, tick only one unless otherwise stated.

B (i) Foundational knowledge of AI

1. What is Artificial Intelligence (AI)?

   Machines that can only store large amounts of data [ ] Machines that perform repetitive mechanical tasks [ ] Machines that perform tasks requiring human intelligence [ ] I don't know [ ]

2. How did you learn about Artificial Intelligence (AI)? (Select all that apply)

   School or university courses [ ] Media [ ] Friends/family [ ] While using AI-powered tools [ ] Others_____

3. Which of the following statements about AI connectivity is correct?

   Can only operate with human supervision [ ] Can function both online and offline depending on their design [ ] Cannot function without cloud computing [ ] Only works on mobile devices [ ]

B (ii) Application knowledge of AI

4. Which of the following is an example of AI in use?

Remote control [ ] Voice assistants like Siri and Alexa [ ] Wall clock [ ] Printed map []

5. Which of the following best describes the function of AI in universities?

AI is not used in any university functions [ ] AI is banned in education [ ] AI for both teaching and administrative purposes [ ] Used exclusively for grading exams [ ]

6. How can AI assist in healthcare diagnostics?

By replacing doctors in all functions [ ] By detecting diseases in medical images like X-rays or MRIs [ ] By organizing hospital furniture[ ] By prescribing medication without supervision [ ]

7. Which of the following statements is true regarding AI relevance to students?

Only computer science students benefit from AI [ ] Has no application in the arts or humanities [ ] Can be relevant to students in all fields of study [ ] AI is only taught in postgraduate courses [ ]

B (iii) Technical knowledge of AI

8. Which of the following programming languages is commonly used in AI development?

HTML [ ] Excel [ ] Python [ ] Word [ ] JavaScript [ ]

9. Which statement best reflects how AI performance changes over time?

Never improves after initial training [ ] AI systems degrade over time [ ] Must be reprogrammed after every task [ ] AI can improve its performance through additional learning [ ]

10. What is an algorithm in the context of AI?

A type of hardware [ ] A set of ethical rules [ ] A method of encryption [ ] A set of instructions to solve problems [ ]

11. What does a neural network in AI try to replicate?

The human eye [ ] The digestive system [ ] The way humans move [ ] The way the human brain processes information [ ]

B (iv) Knowledge of AI ethics

12. Which of the following best describes AI objectivity?

AI is always fair and unbiased [ ] Cannot make mistakes [ ] May reflect the biases in the data or design [ ] AI is programmed to be neutral at all times [ ]

13. Which of the following is true about AI regulation?

Only private companies regulate AI [ ] AI is unregulated and cannot be controlled [ ] Governments and organizations are working on AI regulation [ ] AI regulation is unnecessary [ ]

SECTION C: Perception of AI- Learning Platforms

S/N		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
	I find AI-powered tools and technologies easy to use					
	AI platforms can improve my motivation to study					
	AI-based platforms can improve learning outcomes.					
	AI learning tools are a valuable complement to traditional education.					
	I trust AI to deliver accurate academic content.					
	I believe AI can be biased or misleading.					
	I think AI platforms should be officially integrated into university curricula.					
	AI will eventually replace some roles of traditional lecturers.					
	AI systems respect student privacy and data protection.					
	AI addresses diverse learning styles					

Indicate your level of agreement with the following statements.

11. How do you perceive the role of AI in modern education?

_____

12. What concerns do you have about AI-driven education tools?

_____

SECTION D: Use of AI Platforms

Select how frequently you perform each activity with AI platforms.

1. Do you use AI-driven learning platforms? Yes [ ] No [ ]

2. Which of the following AI-driven learning platforms do you use? (Select all that apply) □ Khan Academy □ Coursera □ Duolingo □ Grammarly □ Quizlet □ Chegg □ Gradescope □ BYJU'S □ Google Classroom with AI features □ Microsoft Teams with AI features □ ChatGPT □ Claude □ Bard/Gemini □ Other (please specify):

_____

3. Which device(s) do you primarily use to access AI-driven learning platforms? (Select all that apply) □ Smartphone □ Laptop □ Desktop Computer □ Tablet □ Other (please specify): _____

4. How much time do you spend on AI-driven learning platforms per session?

_____ hours.

S/N		Always	Often	Sometimes	Rarely	Never
5.	I use AI platforms to assist with assignments.					
	I use AI for explanations of difficult concepts.					
	I use AI to summarize academic articles.					
	I use AI to generate study plans.					
	I use AI for test preparation.					
	I use AI to search for academic materials.					
	I combine AI with textbooks or lecture notes.					
	I use AI during group discussions or projects.					
	I rely heavily on AI platforms for daily learning tasks.					

14. What courses do you most frequently study using AI-driven learning platforms?

_____

SECTION E: Factors Influencing Knowledge, and Use of AI

Please respond to the following questions based on your experience and exposure to AI. Tick the option that applies to you.

1. Have you received formal coursework on AI? Yes □ No □

2. Do you have access to online platforms to learn about AI (e.g., Coursera, edX, YouTube)? Yes □ No □

3. Has your friends' or peers' interest in AI motivated you to learn more about it? Yes □ No □

4. Are your lecturers supportive of your interest in learning AI? Yes □ No □

5.What is the biggest factor that influence your knowledge of AI ?_____

Please respond to the following questions based on your usage of AI tools. Tick the option that best describes your situation.

1. Are you encouraged by your lecturers or department to use AI tools? Yes □ No □

2. Do you have access to AI platforms and tools necessary for practical use? Yes □ No □

3. Can you afford the data costs needed to access AI tools? Yes □ No □

4.What is the biggest factor that influence your use of AI? _____

APPENDIX III

	Feb-15	Mar-15	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-24	Dec-24	Jan-24	Feb-24	Mar-24	Apr-20
Decision on project topics													
Concept Paper													
Introduction													
Literature review													
Materials and methods													
Data collection													
Data analysis													
Results/ Discussion													

Figure 1: Gantt chart showing the work plan of the one-year project

APPENDIX IV

HEALTH RESEARCH ETHICS COMMITTEE (HREC)

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Registration Number:
NHREC-UBTH-HREC/24/12/2022B

PROTOCOL NUMBER: ADM/E 22/A/VOL. VII/148654912714

PROPOSAL TITLE: "KNOWLEDGE, PERCEPTION AND USE OF ARTIFICIAL INTELLIGENCE AMONG STUDENTS OF UNIVERSITY OF BENIN, BENIN CITY."

PRINCIPAL INVESTIGATOR(S): PROMISE TOLULOPE AGBONIDIA & OSARUMWENSE AIBANGBEE

DEPARTMENT/INSTITUTION: DEPARTMENT OF PUBLIC HEALTH AND COMMUNITY MEDICINE, SCHOOL OF MEDICINE, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE, NIGERIA

DATE CONSIDERED: 1ST SEPTEMBER, 2025

DECISION OF THE COMMITTEE: APPROVED

THIS APPROVAL DATES 1/09/2025 TO 31/08/2026. IF THERE IS DELAY IN STARTING THE RESEARCH, PLEASE INFORM THE HREC SO THAT THE DATES OF APPROVAL CAN BE ADJUSTED ACCORDINGLY

REMARK:

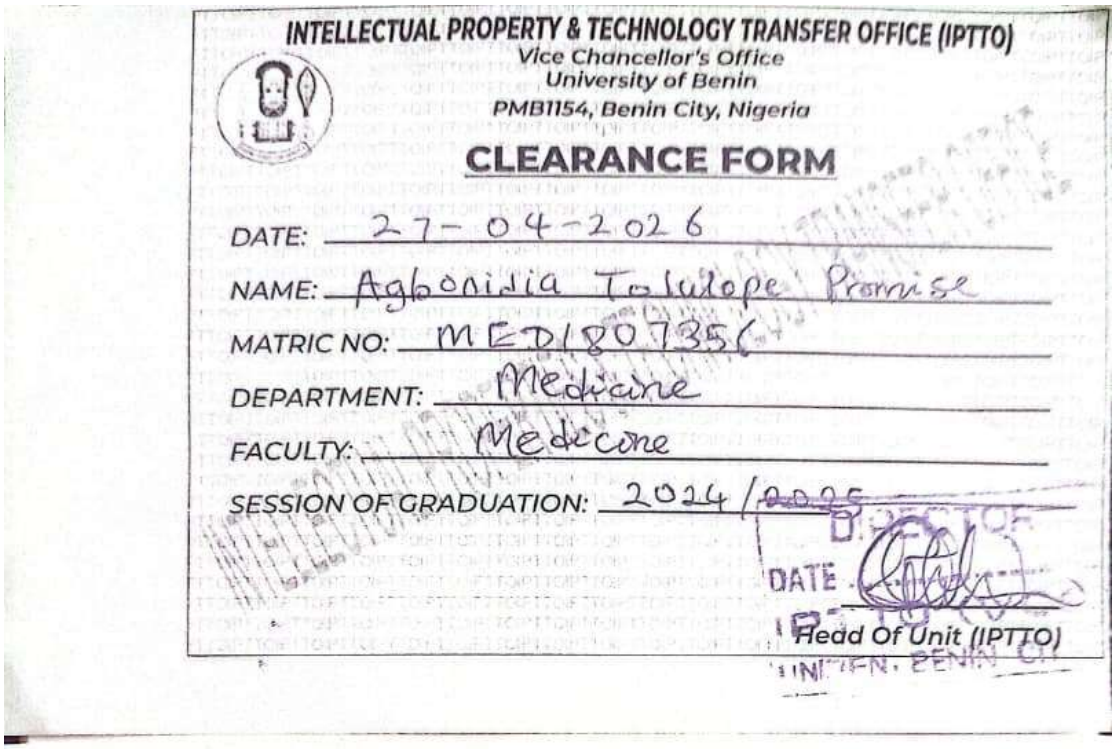
CHAIRMAN: PROF. (MRS) A.N. OFILI **SIGNATURE & DATE**.....1/09/2025

SUPERVISOR (S): PROF. VIVIAN OMUEMU

DECLARATION BY INVESTIGATOR(S):
PROTOCOL NUMBER (please quote in all enquiries)
Note that no participant accrual or activity related to this research may be conducted outside of these dates. All informed consent forms used in this study must carry the HREC assigned number and duration of HREC approval of the study. In multiyear research, endeavor to submit your annual re-port to the HREC early in order to obtain renewal of your approval and avoid disruption of your research. No changes are permitted in the research without prior approval by the HREC except in circumstances outlined in the Code. The HREC reserves the right to conduct compliance visit your research site without previous notification

Signature & Date.....1/09/2025

APPENDIX V

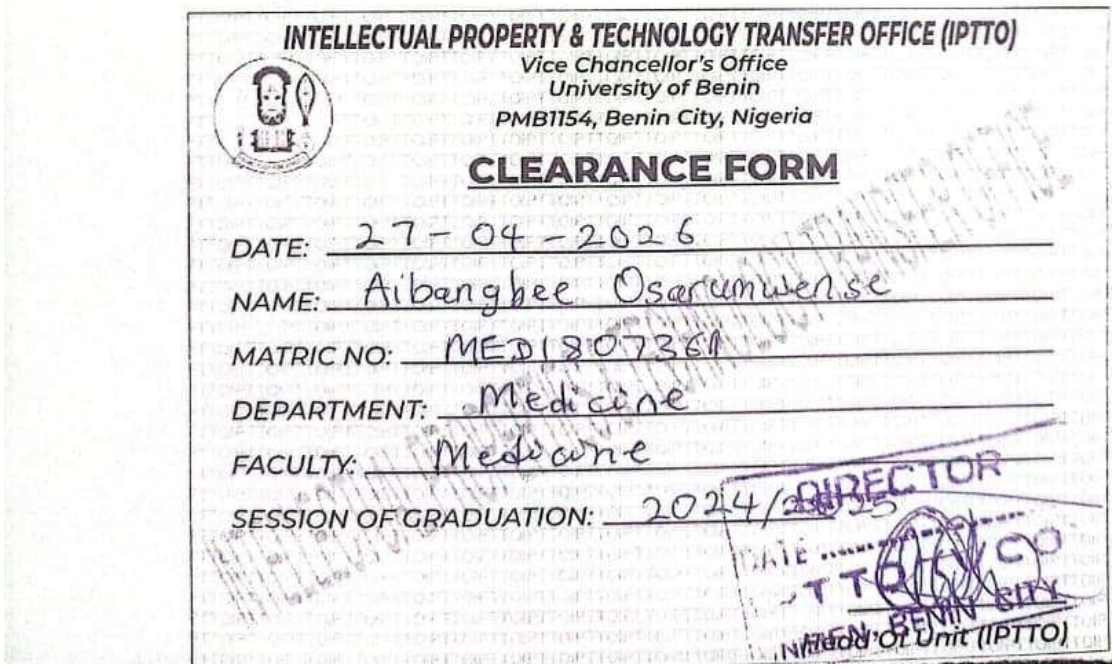


INTELLECTUAL PROPERTY & TECHNOLOGY TRANSFER OFFICE (IPTTO)
Vice Chancellor's Office
University of Benin
PMB1154, Benin City, Nigeria

CLEARANCE FORM

DATE: 27-04-2026
NAME: Agbonidia Tolulope Promise
MATRIC NO: MED/807356
DEPARTMENT: Medicine
FACULTY: Medicine
SESSION OF GRADUATION: 2024/2025

DIRECTOR
DATE
Hedd Of Unit (IPTTO)
UNIV. OF BENIN, BENIN CITY



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Vice Chancellor's Office
University of Benin
PMB1154, Benin City, Nigeria

CLEARANCE FORM

DATE: 27-04-2026
NAME: Aibanghee Oseramwense
MATRIC NO: MED/807361
DEPARTMENT: Medicine
FACULTY: Medicine
SESSION OF GRADUATION: 2024/2025

DIRECTOR
DATE
IPTTO
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