

ASSESSMENT OF THE KNOWLEDGE AND USAGE OF ARTIFICIAL INTELLIGENCE FOR LEARNING ACTIVITIES AMONG UNIVERSITY UNDERGRADUATES IN NASARAWA STATE, NIGERIA

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Abstract

This study assessed the knowledge and use of Artificial Intelligence (AI) for learning activities of undergraduates in Public and Private universities in Nasarawa State, Nigeria. The study employed survey research design. The population of the study consisted of 900 students' of 200 Level. Through simple random sampling technique, 300 students' were selected for the study. A structured questionnaire comprised of 20-item 4-point Likert scale instrument was used to collect data from the respondents. The instrument was validated through experts' and validity index of 0.92 was obtained. Also, Cronbach's Alpha was used to determine the internal consistency of the items which yielded 0.76 coefficient of reliability. The findings revealed that there is no significant difference in the knowledge and usage of AI for academic activities by male and female undergraduates, and there is no significant difference in the knowledge and use of AI for academic activities by undergraduates in public and private universities in Nasarawa State. It was concluded that both male and female undergraduates possess AI knowledge and use it for research activities in similar ways, and that undergraduates in both public and private universities also possess and exhibit AI knowledge with which they carry out various academic activities such as assignments, tests, projects, reading, and problem solving.. Recommendations were made that universities and other tertiary institutions of learning should create more awareness on the knowledge and use of AI for academic activities, and the school environment should be equipped with Wi-Fi so as to make internet services easily accessible to the students among other recommendations.

Keywords: Assessment, Knowledge and usage, Artificial Intelligence, Learning activities, Undergraduates

Introduction

The integration of artificial intelligence (AI) into educational frameworks has emerged as a transformative force in contemporary pedagogy, particularly in developing nations where traditional educational systems face significant resource constraints. In Nigeria, the National Information Technology Development Agency's release of the National Artificial Intelligence Strategy (NAIS) in 2024 explicitly recognized education as a priority area for AI application, emphasizing evidence-based approaches to technology integration (Efe, 2017). This strategic framework has catalysed increased attention to understanding how AI tools influence academic outcomes in Nigerian educational institutions.

Nature has so much endowed humans' race with the ability to develop and create invention. One of such inventions or scientific breakthrough has brought about computer which has brought about human and technological advancement in Education, Medicine, Arts, Social Science, culture, Science and Technology, and lately Artificial Intelligence (AI). This new invention (AI) has brought about a paradigm shift in virtually all spheres of human endeavour. AI is therefore seen as the scientific simulation of human intelligence in machines for learning, reasoning and problem solving. AI is also a specialised area in science and technology that is concerned with computers and machines that can reason and learn in a manner that would normally require human intelligence making it being able to make predictions or creations based on data input and learning.

Guanah and Oribhabor (2023), observed that education can become more personalised and adaptive with the integration of AI, thus catering for the unique requirements of each student and that vast amount of data can be collected and analysed. Garcia et al (2017) and Costa et al (2017) in a separate study on AI reported that AI algorithm and educational robots have become an integral part of learning management and training system that can provide support for a wide array of teaching and learning activities. 'Duolingo', a language learning platform can be used to improve learner experiences. (Belpaene et al, 2022), while iflytek is used for intelligent assessment systems specifically tailored for various grading exercise including the National College Entrance Examination in China (Iflytek, 2024).

Also, Leh (2022) reported that AI-powered learning management systems (LMS) such as Absorb LMS and Decebo offers multiple AI capabilities to support teaching and learning activities, such as intelligent content creation, administrative task automation, and personalised learning. While Belpaeme & Tanara (2020) submitted that Soft Bank Robotics Nao and Pepper robots are developed to serve language teaching social robots. On the attitude to the use of AI, Guanah (2023) reported in his study on the knowledge and perceptions of the use of Artificial Intelligence that most of the respondents have a low level of knowledge in use of AI. On the attitude of student to the use of AI, Alimi, et al (2021) found out that majority of the university students are not aware of the use of the AI for learning,

while Businesslution (2023) observed and reported that 43% of college students in the United States America use AI tools like ChatGPT and half of instructor employ AI to develop their lessons. Guanah (2023), in a study on the Knowledge and Perception of the Use of Artificial Intelligence submitted that most of the respondents (students) have a low level of knowledge in the use of AI. The researcher further found that female students have low knowledge and usage of AI than the male students. In a similar study, Gupta and Snigdh (2023) noted that AI data-driven approach allows for the delivery of customised content, recommendations and feedback, thus, providing students with a tailored learning experience that maximises their potential for success. This study focuses on assessment of the knowledge and usage of artificial intelligence for academic activities among universities undergraduates in Nasarawa State.

Theoretical Framework

This investigation adopts an integrated theoretical framework combining elements from the Technology Acceptance Model (TAM), Constructivist Learning Theory, and Cognitive Load Theory to understand AI's impacts on student academic performance. The Technology Acceptance Model serves as the foundation for understanding how and why university undergraduates adopt AI tools, with perceived usefulness and perceived ease of use as core constructs explaining adoption patterns and usage intensity (Nita et al, 2024). Recent adaptations of TAM specifically for AI educational contexts have incorporated additional factors such as trust in AI systems, concerns about privacy and academic integrity, and perceived impact on learning autonomy (Hwang et al., 2020).

Constructivist Learning Theory provides the pedagogical lens for evaluating AI's impact on learning processes, emphasizing that learning occur through active construction of knowledge rather than passive reception of information. Research applying constructivist principles to AI enhanced learning has shown that when AI tools are designed to promote active engagement and reflection rather than passive consumption, they can significantly enhance learning outcomes (Vygotsky 1978). Cognitive Load Theory offers insights into cognitive mechanisms through which AI tools influence academic performance by distinguishing between intrinsic cognitive load related to learning content, extraneous cognitive load related to instructional design, and germane cognitive load related to meaningful learning processes (Efe, 2017). Artificial Intelligence in Education (AIED) represents a multidisciplinary field combining computer science, cognitive psychology, and educational theory to create intelligent systems supporting learning and teaching processes. AI in education has evolved into a substantial body of literature with diverse perspectives, encompassing various AI technologies including machine learning, natural language processing, computer vision, and intelligent tutoring systems designed to enhance educational experiences (Adedoyin et al., 2024; Gabadeen et al, 2018). UNESCO recognizes that artificial intelligence has the potential to address some of the biggest challenges in education today, innovate

teaching and learning practices, and accelerate progress towards Sustainable Development Goal 4 (UNESCO, 2025).

Statement of the Problem

The integration of AI in universities in Nasarawa State presents both opportunities and challenges. Despite its potential to enhance student learning outcomes, many universities lack the necessary infrastructure, including computers and internet connectivity, to effectively utilize AI tools. Additionally, teachers may not possess the requisite skills to harness AI, potentially limiting its usage in academic activities. The use of AI in universities also raises concerns about data privacy, security, and potential biases in AI algorithms. Furthermore, the use of AI on students' engagement and motivation in universities is not well understood. Against this backdrop, there is need to assess undergraduates knowledge and the use of AI with a view to finding out the students readiness level in the use of AI for assignments, projects, tests, reading and other task assigned to students and equip them with the knowledge and use of various AI tools where and when necessary.

Objectives of the Study

The purpose of this study is to assess the knowledge and use of AI for academic activities among university undergraduates in Nasarawa State. Specifically, the objectives of the study is to find out if:

1. there is any significant difference in the knowledge and use of AI for academic activities between male and female undergraduates.
2. there is a significant difference in the knowledge and use of AI for academic activities between undergraduates in public and private universities.

Hypotheses

The following hypotheses were formulated and tested at 0.05 level of significance.

1. There is no significant difference in the knowledge and use of AI for academic activities between male and female undergraduates.
2. There is no significant difference in the knowledge and use of AI for academic activities by undergraduates who attend public and those who attend private universities.

Methodology

This study employed survey research design. The population for the study was 900, comprising of 200L undergraduates from two universities, one public and one private. From this population, 300 respondents were randomly selected through a simple random sampling technique where every member of the population has an equal chance of being selected. The instrument used for data collection was a structured questionnaire consisted of 20-items 4-point Likert scale instrument. This instrument was validated by three experts in measurement and evaluation for constructive criticisms and this led to the refinement of the instrument for precision. Validity index of 0.92 was therefore obtained. To establish reliability, a

pilot study was conducted. Cronbach's Alpha was used to determine the internal consistency of the items in the questionnaire and coefficient reliability of 0.76 was established. Data collected was analysed using t-test statistic and hypotheses were tested at 0.05 level of significance.

Results

Hypothesis One: There is no significant difference in the knowledge and use of AI for learning activities between male and female undergraduates.

Table 1: T-test showing difference in the knowledge and use of AI for learning activities between male and female undergraduates

Variables	N	Mean	S.D	t-cal.	t-crit.	df
Males	150	4.326	0.52			
Females	150	4.318	0.56	0.82	1.72	298

Table 1 shows that t-critical =1.72 is greater than t-calculated 0.82 i.e t-critical > t-calculated. The null hypothesis is therefore accepted i.e. there is no significant difference in the knowledge and use of AI for academic activities between male and female undergraduates. This implies that both male and female undergraduates have the same experience when it comes to AI knowledge and usage in Nasarawa State.

Hypothesis Two: There is no significant difference in the knowledge and use of AI for learning activities by undergraduates who attend public and private universities.

Table 2: T-test showing difference in the knowledge and use of AI for learning activities by undergraduates in public and private university

Variables	N	Mean	S.D	t-cal.	t-crit.	df
Public	150	4.416	0.54			
Private	150	4.419	0.56	0.06	1.72	298

Table 2 shows that t-critical 1.72 is greater than t-calculated 0.06 i.e t-critical > t-calculated.

Thus, the null hypothesis is therefore accepted, which means that there is no significant difference in the use of AI for academic activities between

undergraduates in the public and private universities. This implies that undergraduates in both public and private universities have the same experience when it comes to AI knowledge and usage in Nasarawa State.

Discussion of Findings

This study assessed the knowledge and use of AI for academic activities among university undergraduates in Nasarawa State. Hypothesis one revealed that there is no significant difference in the knowledge and use of AI for academic activities between male and female undergraduates. The reason for this might be as a result of the fact that both male and female students undergo similar experiences in information and communication technology (ICT) and AI because they live in the same or similar environment and share many things in common. This finding was supported by the study of Business solution (2023), who found that there is no significance in the use of AI between male and female students. However, this finding disagreed with the finding of Guanah (2023) who found that there is a significant difference in the use of AI for academic activities between male and female students, with female students having low knowledge and usage of AI. Hypothesis two revealed that there is no significant difference in the use of AI for academic activities between undergraduates in the public and private universities. The reason for this might be that undergraduates in both private and public universities are taught with the same curriculum; they enjoy friendship among themselves, and that their experiences in university are similar. This finding confirmed the finding of Efe (2017) that AI has no significant difference in the learning outcomes among educational institutions.

Conclusion

From this study, it is evidently clear that both male and female undergraduates possess AI knowledge and use it for research activities in similar ways, and that undergraduates in both public and private universities also possess and exhibit AI knowledge with which they carry out various academic activities such as assignments, tests, projects, reading, and problem solving.

Recommendations

Based on the findings and conclusion, the following recommendations were made. Universities and other tertiary institutions of learning should create more awareness on the knowledge and use of AI for academic activities.

The school environment should be equipped with Wi-Fi so as to make internet services easily accessible to the students.

Student should be well enlightened on the use of various AI tools such as ChatGPT, iflytek, and Duolingo.

Teachers should task students to use various AI tools platforms in addition to other platforms to carry out assignments and other academic tasks.

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