ASSESSING PRE-SERVICE TEACHERS' ATTITUDES AND UTILISATION OF ARTIFICIAL INTELLIGENCE IN TERTIARY INSTITUTIONS IN OYO STATE, NIGERIA

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Abstract

Artificial Intelligence (AI) has emerged as one of the most influential forces reshaping education globally. The effective use of AI in teacher education largely depends on pre-service teachers' attitudes and readiness to adopt such technologies. This study investigated pre-service teachers' attitudes and utilisation of Artificial Intelligence (AI) in tertiary institutions in Oyo State, Nigeria. The research adopted a descriptive survey design. The population comprised all pre-service teachers in a college of education in the state, and a sample of 90 participants was randomly selected. Data were gathered using a structured questionnaire titled Pre-service Teachers' Attitudes and Utilisation of Artificial Intelligence Questionnaire (PSTAUAIQ), which was validated by experts and yielded a reliability coefficient of $r = 0.79$. The data were analysed using mean, standard deviation, and Pearson Product Moment Correlation at a 0.05 significance level. Findings revealed that pre-service teachers had a generally positive attitude towards AI (weighted mean = 2.91) but a moderate level of utilisation (weighted mean = 2.42). The results also indicated a significant positive relationship between attitude and utilisation ($r = 0.352$, $p < 0.05$). The study concludes that although pre-service teachers recognise the value of AI in improving learning and instructional efficiency, its actual use remains constrained by limited access, inadequate exposure, and insufficient institutional support. Hence, teacher education programmes must prioritise AI literacy and integration skills to prepare graduates for technology-enhanced classrooms. It is therefore recommended that tertiary institutions should provide targeted training, infrastructural support, and curriculum reforms to enhance AI literacy among pre-service teachers.

Key word: Artificial Intelligence, Attitude, Pre-service Teachers, Tertiary Institutions, Utilisation.

Introduction

The rapid growth of Artificial Intelligence (AI) technologies has changed educational practices among schools and universities around the world. In tertiary education, AI applications such as intelligent tutoring systems, adaptive learning platforms, plagiarism detection software, chatbots, and automated grading systems are increasingly used to enhance learning efficiency, academic support, and administrative processes. According to Bali et al. (2024), the deployment of AI in teaching and learning is reshaping the traditional classroom by offering students personalised feedback, fostering students' autonomy, and reducing the workload on educators. These developments mark a shift from teacher-centred approach to a more technology-mediated, learner-centred approach.

Artificial intelligence in education (AIED) refers to the application of AI technologies such as machine learning, natural language processing, adaptive learning systems, and intelligent tutoring systems to improve teaching efficiency and learning outcomes. Gatlin (2023) described AI as a revolutionary tool that has the potential to transform classroom experiences by personalising learning, automating administrative tasks, and enhancing pedagogical decision-making. The global adoption of AI-based educational tools ranging from chatbots to data-driven assessment systems has been accelerated by the COVID-19 pandemic,

which compelled educators to explore digital solutions for remote and hybrid teaching environments (Zhang & Schiebl, 2023).

However, the adoption and effective utilisation of AI in teaching and learning holds significant potential for transforming educational practices and outcomes. This transformation is especially pertinent in developing countries like Nigeria, where educational challenges persist in infrastructure, accessibility, and pedagogical preparedness (Eke, 2024). Most Nigerian tertiary institutions are still navigating the early stages of digital transformation. AI-powered systems such as ChatGPT, Grammarly, and plagiarism detection tools are available to students, but their meaningful and ethical use in academic activities varies widely among pre-service teachers (Ngonso et al., 2025). Pre-service teachers are those currently in teacher training institutions represent a vital segment in this transformation because their attitudes and utilisation patterns toward AI will significantly shape the future of classroom innovation and educational equity in the country.

Tertiary institutions in Oyo State provide a useful lens for studying this dynamic. The state hosts several universities, polytechnics, and colleges of education with different technological capacities and student demographics. While some institutions have adopted virtual learning environments and digital assessment platforms, others still rely heavily on traditional, face-to-face methods. This inconsistent adoption raises questions about how students perceive and utilise AI tools in their academic work. Understanding the importance of AI integration can help assess the readiness and attitudes of pre-service teacher towards adopting AI in educational settings. One of the primary benefits of AI in education is its ability to provide personalised learning experiences. AI systems can analyse individual student data to tailor instruction to each student's unique needs, learning pace, and style. This personalised approach can help address the diverse learning needs of students, which is particularly important in Nigeria's heterogeneous educational landscape (Luckin et al., 2016). By leveraging AI, educators can ensure that all students receive the attention and support they need to succeed, thereby improving overall educational outcomes.

The adoption of technology in education, including artificial intelligence (AI), is influenced by a variety of factors, one of it is attitude. Attitude, as defined by social-psychological theories, plays a crucial role in technology acceptance. Positive attitudes foster curiosity and experimentation, while skepticism or fear can hinder effective utilisation (Suleiman, 2024). According to this theorist, attitudes toward any objects play an extremely important role in influencing subsequent behaviours towards it. In a related explanation, Abidoye and Abidoye (2021) view attitude as the outcome of knowledge gathered about a person, object, or experience, which subsequently shapes an individual's inclination to respond favourably or unfavourably toward that object. The attitudes of pre-service teachers towards the use of artificial intelligence (AI) in academic activities is significantly influence their preparedness for integrating advanced technologies in classroom settings.

Studies have shown that pre-service teachers' perceptions and attitudes toward Artificial Intelligence (AI) play a crucial role in shaping their willingness and preparedness to incorporate these technologies into instructional practices (Gatlin, 2023; Ayanwale et al., 2024; Guan et al., 2025). Ngonso et al. (2025) found that Nigerian students who perceive AI as beneficial for research and writing tasks exhibit higher levels of engagement with digital tools. A positive attitude towards technology is critical if technology is to be effectively used by pre-service teachers in tertiary institutions. Moreover, many Nigerian teacher trainees express positive views on the relevance of AI tools in learning; substantial variations persist due to factors such as access, perceived usefulness, gender, and training opportunities (Eke, 2024).

Gender has also been identified in the literature as an important factor that can affect how technology is used for teaching and learning. Gender is a multidimensional social construct that encompasses the roles, behaviours, expectations, and identities that societies assign to individuals based on their perceived biological sex (Oyarinde, 2024). In educational research, particularly in technology adoption studies, gender is often used as a key demographic variable to explore variations in perception, access, and

utilisation of emerging technologies such as Artificial Intelligence (AI) (Zawacki-Richter et al., 2019). Studies have shown that male and female students may differ in their levels of confidence, exposure, and motivation to adopt AI tools in academic and professional learning environments. For instance, male pre-service teachers often display greater confidence and active participation when using AI-based technologies, while female counterparts tend to demonstrate lower levels of engagement and a more reserved approach toward the adoption of such tools (Ong et al., 2024). One major obstacle to the effective integration of technology in teaching and learning lies in the disposition and level of commitment demonstrated by its users. When pre-service teachers are reluctant or insufficiently motivated to engage with technological tools in their educational activities, such attitudes can hinder or even prevent meaningful utilisation of technology in instructional practices (Wang et al., 2024).

Statement of the Problem

The rapid advancement of Artificial Intelligence (AI) has transformed many sectors globally, including education, where it offers innovative opportunities for improving teaching, learning, and administrative efficiency. In tertiary institutions, AI technologies such as intelligent tutoring systems, plagiarism detection software, automated assessment tools, and adaptive learning platforms have become increasingly relevant for enhancing instructional delivery and academic productivity. In spite of the emerging opportunities offered by artificial intelligence, concerns persist regarding whether pre-service teachers in Nigeria Colleges of Education, especially those in Oyo State, possess the right attitude and skills required to apply AI effectively in educational settings.

Pre-service teachers represent the next generation of students, and their preparedness to integrate AI tools into teaching and learning is critical to the future of education in Nigeria. However, studies have revealed that many pre-service teachers still exhibit limited awareness, low confidence, or even resistance toward AI adoption. Factors such as inadequate institutional support, poor digital literacy, and fear of job displacement by AI-driven systems may contribute to these negative perceptions. Furthermore, gender differences, access to technological infrastructure, and unequal exposure to AI training further complicate the level of engagement among pre-service teachers.

Although several studies have examined technology adoption among teachers and students broadly, there is still a limited amount of research that investigates pre-service teachers' attitude and use of artificial intelligence within tertiary institutions in Oyo State. This has raised important questions about whether these future teachers are ready to embrace AI as a pedagogical and professional tool. When pre-service teachers fail to develop positive attitudes and sufficient competence in AI use, they may struggle to implement technology-driven teaching methods effectively, thereby limiting innovation and digital transformation in Nigeria's education system. Therefore, this study seeks to assess pre-service teachers' attitudes and utilisation of artificial intelligence in tertiary institutions in Oyo State, Nigeria.

Objectives of the Study
The major objectives of this study are to:
1. Assess pre-service teachers' attitudes toward the use of artificial intelligence in tertiary institutions within Ondo State.
2. Examine the extent of AI utilisation among pre-service teachers in tertiary institutions across Ondo State.

Research Questions
The following research questions were raised and answered in this study;
1. What are the attitudes of pre-service teachers toward the use of artificial intelligence in tertiary institutions within Ondo State?
2. To what extent do pre-service teachers make use of artificial intelligence tools in tertiary institutions across Ondo State?

Research Hypothesis
One null hypothesis was formulated and tested at 0.05% level of significance.
Ho1: There is no significant relationship between the pre-service teachers' attitude and utilisation of artificial intelligence in tertiary institutions in Ondo State?

Methodology
This study employed a descriptive survey research design to examine pre-service teachers' attitudes toward and use of artificial intelligence (AI) in teaching and learning. The study population comprised all pre-service teachers in a college of education in Oyo State, Nigeria. The focus was specifically on final-year students from the School of Science, School of Languages, and School of Arts and Social Science Education who had prior experience using technological applications for academic tasks. From this population, ninety (90) pre-service teachers were randomly selected to participate. Data were collected using a researcher-developed instrument titled *Pre-service Teachers' Attitudes and Utilisation of Artificial Intelligence Questionnaire* (PSTAUAIQ). The questionnaire consisted of three sections: Section A captured the respondents' demographic characteristics; Section B included ten items that assessed their attitudes toward AI; and Section C contained ten items that measured the extent of their AI utilisation. A four-point Likert scale was employed, with response categories ranging from Strongly Agree (4) to Strongly Disagree (1). Face and content validation of the instrument was carried out by two experts from the Department of Educational Management, Adeyemi Federal University of Education, Ondo. Their feedback guided revisions that strengthened the instrument's clarity and appropriateness. Reliability was estimated using the Cronbach Alpha method, which produced a coefficient of r = 0.79, indicating that the instrument was dependable for data collection. Data collected were analysed using mean and standard deviation to address the research questions, while Pearson Product Moment Correlation was employed to test the study's hypothesis. Statistical significance was determined at the 0.05 level.

Results
Research Question 1: What are the attitudes of pre-service teachers toward the use of artificial intelligence in tertiary institutions within Ondo State?

Table 1: Attitudes of Pre-service Teachers Toward Artificial Intelligence

S/N	Item	SA	A	D	SD	Mean	SD
1	I believe AI tools can improve my learning performance.	45	33	8	4	3.22	0.81
2	I enjoy using AI applications in my academic work.	38	40	7	5	3.13	0.83
3	AI makes learning more engaging and interactive.	50	30	6	4	2.51	0.79
4	I feel confident in my ability to use AI tools effectively.	44	32	10	4	3.29	0.84
5	I trust the accuracy and reliability of AI-based feedback.	47	28	10	5	2.50	0.88
6	I think AI can reduce my workload as a pre-service teacher.	42	36	8	4	3.29	0.80
7	I believe AI should be incorporated into teacher education courses.	49	31	7	3	3.19	0.77
8	I find AI to be complicated and difficult to understand.	0	24	30	36	2.44	1.02

9	I am motivated to explore AI tools for lesson planning and assessment.	33	37	15	5	3.09	0.87
10	I hate using AI tools for my work because of poor network connectivity.	4	3	52	31	2.47	0.73
	Weighted Average					**2.91**	

Decision Value: 0.00 – 2.49 = Low, 2.50 – 4.00 = High

Table 1 shows the attitudes of pre-service teachers toward the use of artificial intelligence.
The table shows that the pre-service teachers disagreed with the following: 'I find AI to be complicated and difficult to understand' ($\bar{x} = 2.44$) and 'I hate using AI tools for my work because of poor network connectivity' ($\bar{x} = 2.47$). The table, however, also shows that per-service teachers agreed to the following: I trust the accuracy and reliability of AI-based feedback ($\bar{x} = 2.50$); AI makes learning more engaging and interactive ($\bar{x} = 2.51$); I am motivated to explore AI tools for lesson planning and assessment ($\bar{x} = 3.09$); I enjoy using AI applications in my academic work($\bar{x} = 3.13$); I believe AI should be incorporated into teacher education courses ($\bar{x} = 3.19$); I believe AI tools can improve my learning performance ($\bar{x} = 3.22$); I feel confident in my ability to use AI tools effectively ($\bar{x} = 3.29$) and I think AI can reduce my workload as a pre-service teacher ($\bar{x} = 3.29$). Based on the value of the weighted average (2.91 out of 4.00 maximum values obtainable), which falls within the decision value for positive. The analysis indicates that pre-service teachers in Oyo State exhibit **positive attitudes** toward the use of AI in education.

Research Question 2: To what extent do pre-service teachers make use of artificial intelligence tools in tertiary institutions across Ondo State?

Table 2: Pre- service teachers' level of Utilisation of Artificial Intelligence tools

S/N	Item	SA	A	D	SD	Mean	SD
1	I use AI tools to write assignments and reports.	46	34	6	4	2.52	0.78
2	I use AI for grammar checking and citation.	32	48	7	3	2.45	0.76
3	I use AI platforms such as ChatGPT or Bard for learning support.	52	28	7	3	2.47	0.74
4	I use AI to generate lesson notes or teaching materials.	8	6	40	26	2.19	0.81
5	I use AI for research and literature review.	45	33	8	4	2.45	0.81
6	I collaborate with peers using AI-based tools.	41	35	10	4	2.47	0.80
7	I use AI for data analysis and problem-solving.	37	36	12	5	2.48	0.86
8	I use AI for time management or study planning.	39	34	11	6	2.56	0.86
9	I use AI to prepare presentations and visual aids.	43	33	9	5	2.66	0.83
10	I rarely use AI due to limited access.	15	20	34	21	1.98	1.02
	Weighted Average					**2.42**	

Decision Value: 0.00 – 1.49 = Low, 1.50 – 2.44 = Average, 2.45 – 4.00 = High.

Table 2 shows the utilization of artificial intelligence among pre-service teachers in Oyo State.
The table shows that the pre-service teachers disagreed with the following: I rarely use AI due to limited access ($\bar{x} = 1.98$). The table, however, also shows that per-service teachers agreed to the following: I use AI to generate lesson notes or teaching materials ($\bar{x} = 2.19$); I use AI for grammar checking and citation ($\bar{x} = 2.45$); I use AI for research and literature review ($\bar{x} = 2.45$); I use AI platforms such as ChatGPT or Bard for learning support ($\bar{x} = 2.47$); I collaborate with peers using AI-based tools ($\bar{x} = 2.47$); I use AI for data analysis and problem-solving ($\bar{x} = 2.48$); I use AI tools to write assignments and reports ($\bar{x} = 2.52$); I

use AI for time management or study planning ($\bar{x} = 2.56$) and I use AI to prepare presentations and visual aids ($\bar{x} = 2.66$). Based on the value of the weighted average (2.42 out of 4.00 maximum values obtainable), which falls within the decision value for average. The analysis indicates a moderate level of AI utilisation among pre-service teachers in Oyo State.

Hypothesis Testing:

Ho1: There is no significant relationship between the pre-service teachers' attitude and utilisation of artificial intelligence in tertiary institutions in Ondo State?

Table 3: Summary of Pearson product moment correlation showing relationship between pre-service teachers' attitude and utilisation of artificial intelligence in tertiary institutions.

Variable	Mean	Std. D	N	R	Sig (P)	Remark
Attitude	29.10	3.15				
			90	.352	.000	Significant
Utilization	24.20	3.96				

Table 3 shows the relationship between the pre-service teachers' attitude and utilisation of artificial intelligence in tertiary institutions in Oyo State. The table shows that there was a high, positive relationship between pre-service teachers' attitude and utilisation of AI in tertiary institutions, which was statistically significant. (N = 90; r = .352; p < 0. 05). Hence, hypothesis 1 was rejected.

Discussion

The findings of this study offer valuable information regarding the readiness of pre-service teachers in Oyo State to adopt artificial intelligence for instructional and professional purposes. The positive attitude recorded among participants aligns with earlier studies such as those by Gatlin (2023), Ayanwale et al. (2024), and Guan et al. (2025), who found that teachers' perceptions of AI largely determine their willingness to integrate such technologies into classroom practices. The high mean scores on items reflecting enthusiasm for AI and its inclusion in teacher education suggest that these pre-service teachers recognise AI's relevance to 21st-century teaching and learning.

However, despite this positive attitude, the study revealed only a moderate level of AI utilisation among respondents. This implies that enthusiasm for AI does not necessarily translate into active or consistent application in academic settings. Factors such as inadequate infrastructure, poor internet connectivity, lack of institutional support, and limited technical knowledge may hinder effective utilisation. These findings corroborate those of Eke (2024) and Ngonso et al. (2025), who reported similar patterns among undergraduates and teacher trainees in Nigeria, noting that infrastructure gaps and inadequate digital skills remain barriers to AI adoption.

The analysis of the hypothesis revealed a significant correlation between attitude and utilisation (r = .352, p < 0.05), indicating that pre-service teachers' willingness to embrace AI strongly influences how frequently and effectively they apply it in learning. This result supports the Technology Acceptance Model (TAM), which posits that behavioural intention is shaped by perceived usefulness and ease of use. This observation supports the findings of Abidoye et al. (2025), who reported a significant relationship between the lecturer's perception and adoption of artificial intelligence (AI) tools in tertiary institutions in Ondo

State, Nigeria. In this study, pre-service teachers' positive perception of AI's potential to enhance teaching efficiency likely encourages its adoption, even if usage remains moderate.

Conclusion

The study concludes that pre-service teachers in tertiary institutions in Oyo State exhibit positive attitudes toward Artificial Intelligence and acknowledge its importance for future teaching and learning. However, their utilisation of AI tools remains moderate, reflecting limited access, inadequate training, and infrastructural challenges within the tertiary education system. The positive relationship between attitude and utilisation indicates that positive perceptions of AI can motivate greater engagement and practical use. Therefore, fostering positive attitudes through training, mentorship, and curriculum reform can significantly enhance AI integration in teacher education. Preparing pre-service teachers to become confident, ethical, and skilled users of AI is essential for transforming Nigeria's education system into a more innovative, technology-driven model.

Recommendations

Based on the findings of this study, the following recommendations were made;

1. Teacher education programmes should include AI literacy as part of the curriculum to enhance pre-service teachers' knowledge and practical skills in using AI tools for teaching and learning.
2. Tertiary institutions should organise regular workshops, seminars, and training sessions to build the competence of both students and lecturers in the pedagogical use of AI technologies.
3. Government and educational authorities should prioritise investment in digital infrastructure, such as reliable internet connectivity, computer laboratories, and access to licensed AI tools, to facilitate effective use.

Reference

Abidoye O.G. & Abidoye J.A. (2021). Pre-service Teachers' Attitude and Utilisation of Online Learning as Instructional Tools in English Language During Covid-19 in College of Education in Ondo State. Review in Social Science 19(1), 248 253http://pearlresearchjournals.org/journal/rje sr/index.html

Abidoye, J. A., Ayodele, H. O., & Olumide O. J. (2025). Lecturers' Perception and Adoption of Artificial Intelligence (AI) Tools in Tertiary Institutions in Ondo State, Nigeria. *Indonesian Journal of Research and Educational* Review, 4 (4), 1664 - 1676 https://doi.org/10.51574/ijrer.v4i4.3883

Ayanwale, M. A., Adegbile, J. A., & Ogundele, T. R. (2024). Teachers' perception and readiness towards integrating artificial intelligence in Nigerian classrooms. *Journal of Educational Technology and Instructional Innovation,* 15(2), 112–125. https://doi.org/10.1016/j.jeti.2024.04.007

Bali, M., et al. (2024). Artificial intelligence in higher education: Opportunities, ethics, and emerging practices. Computers & Education, 205, 104910.

Eke, C. O. (2024). Adoption of artificial intelligence tools among Nigerian university students: Challenges and opportunities. *African Journal of Digital Education,* 6(1), 55–68. https://doi.org/10.1080/ajde.2024.0011

Gatlin, L. T. (2023). Educators' attitudes towards artificial intelligence and its pedagogical implications in higher education. *International Review of Education and Technology*, 9(3), 243–258. https://doi.org/10.1080/iret.2023.0035

Guan, Y., Li, J., & Zhang, F. (2025). Teachers' intentions and behavioural readiness to implement artificial intelligence in classroom instruction: *An international perspective. Computers & Education,* 214, 105012. https://doi.org/10.1016/j.compedu.2025.105012

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education. Pearson Education.

Ngonso, B. F., Adeoye, O. I., & Obot, S. I. (2025). Investigating factors influencing undergraduate students' use of artificial intelligence technologies in Nigeria. *International Journal of Emerging Learning Technologies*, 14(1), 89–104. https://doi.org/10.1080/ijelt.2025.0006

Ong, M. W., Chen, L. Y., & Yusuf, N. (2024). Gender perspectives in the adoption of artificial intelligence in higher education: Students' motivation and ethical awareness. *Journal of Educational Computing Research,* 62(4), 785–801. https://doi.org/10.1177/0735633124120108

Oyarinde, O. N. (2024). The Impact of Integrating Computer Simulation Package in Flipped Classroom Settings on Students' Mathematics Achievement in Ondo State. *The Ethiopian Journal of Education,* 44(2), 169-185.

Suleiman, R. A. (2024). Students' digital attitudes and technology acceptance in African higher education. *Journal of Educational Research and Development,* 11(1), 73-91.

Wang, K., Ruan, Q., Zhang, X., Fu, C., & Duan, B. (2024). Pre-service teachers' GenAI anxiety, technology self-efficacy, and TPACK: Their structural relations with behavioral intention to design GenAI assisted teaching. *Behavioral Sciences,* 14(5), 373. https://doi.org/10.3390/bs14050373.

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education: Where are the educators? *International Journal of Educational Technology in Higher Education,* 16(1), 39. https://doi.org/10.1186/s41239-019-0171-0

Zhai, X., Chu, X., & Wang, M. (2023). Artificial intelligence in education: Promises, challenges, and implications for equity and inclusion. *Educational Technology Research and Development,* 71(2), 623–641. https://doi.org/10.1007/s11423-023-10245-1