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Assessing the readiness and attitudes of Nigerian teacher educators towards adoption of artificial intelligence in educational settings

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Highlights

- Nigerian educators show readiness and positivity towards AI in education.
- Barriers like infrastructure and training hinder AI adoption.
- Training and support are key for successful AI integration.

Abstract

This study investigated readiness and attitudes of Nigerian teacher educators towards adoption of Artificial intelligence (AI) in educational. The population of the study included teacher educators from various educational institutions in Nigeria, and a sample size of 250 participants was used. The study utilized four research questions to explore the familiarity, attitudes, and perceived barriers related to AI adoption. The researchers employed a survey instrument to collect data, which was validated for reliability using Cronbach's alpha test. The results showed a high level of readiness and positive attitudes among the Nigerian teacher educators towards the adoption of AI-powered educational tools, such as personalized learning platforms, automated grading systems, and virtual tutors. The findings highlighted the teacher educators' recognition of the potential benefits of AI in addressing educational challenges, as well as their confidence in integrating AI-driven automated grading systems into their teaching practices. However, the study also identified perceived barriers, including inadequate infrastructure, insufficient training, and ethical concerns, which need to be addressed to ensure successful AI integration. One of the key recommendations from the study is to implement comprehensive training and professional development programs for Nigerian teacher educators, focusing on the practical implementation of AI-powered educational tools. This will enhance their confidence, competence, and ability to effectively integrate these technologies into their teaching practices.

Article Info: Research Article

Keywords: *readiness, attitudes, artificial intelligence, teacher educators, infrastructure, training, adoption*

1. Introduction

Artificial intelligence (AI) is revolutionizing education by providing innovative solutions that enhance both teaching and learning processes. AI technologies offer the potential to address various educational challenges, such as personalized instruction, efficient assessment, and increased accessibility. For Nigerian teacher educators, understanding and adopting these AI applications is crucial for modernizing the educational landscape and preparing future generations for a technology-driven world. Personalized learning platforms use AI to tailor educational content to meet the unique needs and learning pace of each student. These systems analyze data from student interactions to adapt the curriculum and provide customized resources. For instance, AI-driven tools like Smart Sparrow and DreamBox Learning adjust

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difficulty levels and offer targeted feedback to enhance student engagement and achievement (Luckin et al., 2016). By adopting such technologies, Nigerian teacher educators can offer more individualized support to students, potentially improving learning outcomes across diverse educational settings. Automated grading systems utilize AI to evaluate student work, particularly in assessments involving multiple-choice questions, essays, and coding assignments. Tools like Gradescope and Turnitin not only expedite the grading process but also ensure consistent and unbiased evaluation (Holmes et al., 2019). For Nigerian teacher educators, integrating automated grading can significantly reduce the administrative burden, allowing more time for interactive teaching and personalized student support. This can lead to a more efficient educational process and better utilization of educators' time.

Virtual tutors provide on-demand assistance and support to students outside the traditional classroom environment. AI-powered platforms like Carnegie Learning and Squirrel AI Learning offer interactive, conversational agents that help students with their queries, provide explanations, and guide them through complex topics (Woolf, 2010). These virtual tutors can be particularly beneficial in Nigeria, where teacher-student ratios are often high, and access to quality education resources may be limited. By leveraging virtual tutors, teacher educators can extend their reach and provide continuous support to a larger number of students. Understanding the readiness and attitudes of Nigerian teacher educators towards AI adoption involves examining their familiarity with and perceptions of these AI applications. Research indicates that positive attitudes towards technology are closely linked to educators' awareness of its benefits and practical applications (Davis, 1989). Thus, showcasing the potential of personalized learning, automated grading, and virtual tutors can help in assessing and fostering a supportive environment for AI integration.

The integration of artificial intelligence (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 such as high student-to-teacher ratios, limited resources, and varying educational quality are prevalent. Understanding the importance of AI integration can help assess the readiness and attitudes of Nigerian teacher educators towards adopting AI in educational settings. One of the primary benefits of AI in education is its ability to provide personalized learning experiences. AI systems can analyze individual student data to tailor instruction to each student's unique needs, learning pace, and style. This personalized 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. AI technologies can automate administrative tasks such as grading and record-keeping, freeing up valuable time for educators to focus on more meaningful interactions with students (Holmes et al., 2019). Automated grading systems, for example, can quickly and accurately assess student work, providing immediate feedback and reducing the burden on teachers. For Nigerian teacher educators, who often manage large classes and extensive workloads, the adoption of AI can lead to more efficient classroom management and enhanced instructional quality.

AI systems can collect and analyze vast amounts of educational data, providing insights into student performance, learning trends, and potential areas for intervention. This data-driven approach enables educators to make informed decisions about instructional strategies, curriculum adjustments, and resource allocation (Woolf, 2010). In Nigeria, where educational resources are often limited, utilizing AI for data-driven decision making can help optimize resource use and improve educational planning and outcomes. AI technologies can support inclusive education by providing customized learning materials and assistive tools for students with disabilities. For instance, AI-driven speech recognition and text-to-speech technologies can aid students with visual or hearing impairments (Holmes et al., 2019). In Nigeria, where access to specialized educational resources may be limited, AI can play a crucial role in ensuring that all students, regardless of their abilities, have access to quality education. Teacher educators play a pivotal role in the adoption of artificial intelligence (AI) in educational settings. As the primary agents responsible for training future teachers, they are uniquely positioned to influence the integration of AI technologies in the classroom. Understanding their readiness and attitudes towards AI adoption is crucial, particularly in the context of Nigerian education, where various challenges and opportunities exist.

Teacher educators are responsible for equipping pre-service teachers with the necessary skills and knowledge to effectively use AI technologies. This involves incorporating AI-related content into the curriculum and modeling best practices for AI integration in teaching and learning (Ertmer & Ottenbreit-Leftwich, 2010). Professional development programs tailored for teacher educators can enhance their competence and confidence in using AI tools, thereby fostering a positive attitude towards AI adoption. Training should cover practical applications of AI, ethical considerations, and strategies for integrating AI into various educational contexts. By being well-versed in AI technologies, teacher educators can better prepare future teachers to leverage AI for personalized learning, efficient classroom management, and data-driven instruction (Holmes et al., 2019). Also teacher educators play a critical role in developing and revising the curriculum to include AI literacy and competencies. This involves designing courses and modules that address the fundamentals of AI, its applications in education, and the pedagogical implications of AI technologies (Luckin et al., 2016). By embedding AI into the teacher education curriculum, educators can ensure that pre-service teachers are well-prepared to adopt and integrate AI in their future classrooms. As mentors, teacher educators provide guidance and support to pre-service teachers as they navigate the complexities of AI integration. This includes offering practical advice, sharing experiences, and providing feedback on the use of AI tools in teaching practice (Suleiman & Ifinedo, 2021). Effective mentorship can help alleviate apprehensions and build a positive disposition towards AI among future teachers. Teacher educators can act as advocates for AI adoption within their institutions and the broader educational community. By staying informed about the latest developments in AI and its educational applications, they can influence policy decisions and promote initiatives that support AI integration (Mbah, 2020). Their leadership can drive institutional changes that facilitate the adoption of AI, such as securing funding for AI technologies, establishing partnerships with tech companies, and creating professional learning communities focused on AI.

The adoption of technology in education, including artificial intelligence (AI), is influenced by a variety of factors. Understanding these factors is crucial for assessing the readiness and attitudes of Nigerian teacher educators towards AI adoption. These factors can be broadly categorized into technological, pedagogical, and organizational domains. Technological factors pertain to the characteristics and capabilities of the AI tools themselves, including their accessibility, usability, and reliability. The availability of necessary infrastructure, such as high-speed internet, computers, and AI software, is fundamental for the adoption of AI technologies. In many parts of Nigeria, limited access to reliable internet and modern hardware can be significant barriers (Mbah, 2020). Ensuring that teacher educators have access to the required technological resources is a crucial step towards fostering a positive attitude towards AI adoption. The perceived ease of use of AI technologies significantly impacts their adoption. Tools that are user-friendly and require minimal technical expertise are more likely to be embraced by educators (Davis, 1989). Training programs should focus on simplifying the use of AI tools and providing hands-on experience to build confidence among Nigerian teacher educators. Continuous technical support is essential to address any issues that educators may encounter while using AI tools. The availability of support services, such as help desks, technical manuals, and online resources, can alleviate concerns and enhance the adoption process (Holmes et al., 2019).

Pedagogical factors involve the integration of AI technologies into teaching and learning practices. These factors include the alignment of AI tools with educational goals, teaching strategies, and curriculum design. AI technologies should support the overarching educational goals and objectives of the curriculum. Educators need to see the value of AI in enhancing student learning outcomes, such as through personalized learning pathways and improved assessment methods (Luckin et al., 2016). Demonstrating the alignment of AI with educational goals can motivate Nigerian teacher educators to adopt these technologies. Effective integration of AI requires adapting teaching strategies to leverage the strengths of AI tools. This may involve using AI for differentiated instruction, formative assessment, and providing real-time feedback (Ertmer & Ottenbreit-Leftwich, 2010). Professional development programs should emphasize innovative teaching strategies that incorporate AI. Integrating AI into the curriculum requires careful planning and design. AI should not be seen as an add-on but as an integral part of the teaching and learning process.

Curriculum development efforts should focus on embedding AI across various subjects and grade levels (Suleiman & Ifinedo, 2021).

Organizational factors relate to the broader institutional context within which AI adoption occurs. These include leadership support, policies, and the organizational culture. Strong leadership and supportive policies are critical for successful technology adoption. Educational leaders in Nigeria need to advocate for AI integration, allocate resources, and develop policies that encourage experimentation and innovation (Mbah, 2020). Institutional leaders should also provide clear guidelines and expectations regarding the use of AI in education. Ongoing professional development is essential for building the capacity of teacher educators to use AI effectively. Training programs should be continuous, relevant, and tailored to the specific needs of educators (Ertmer & Ottenbreit-Leftwich, 2010). Investing in professional development can enhance educators' readiness and positive attitudes towards AI. The culture within educational institutions plays a significant role in technology adoption. A culture that values innovation, collaboration, and continuous improvement is more likely to support the integration of AI. Encouraging a positive attitude towards change and fostering a collaborative environment can facilitate AI adoption among Nigerian teacher educators (Suleiman & Ifinedo, 2021).

One of the key elements influencing the adoption of artificial intelligence (AI) among educators is the **relative advantage** it offers. Educators are more likely to embrace AI technologies when they perceive significant benefits, such as personalized learning experiences and increased efficiency in grading. Research by Holmes et al. (2019) highlights that when these substantial improvements over traditional methods are recognized, the likelihood of adoption escalates. In addition to relative advantage, **compatibility** plays a crucial role in the adoption process. For AI tools to be accepted, they must align with existing educational practices and values. Educators are more inclined to adopt AI when it complements their teaching philosophies and addresses their students' needs effectively. Tondeur et al. (2012) found that AI applications that resonate with constructivist teaching strategies are often met with greater acceptance. Moreover, the element of **complexity** cannot be overlooked. The perceived ease of use of AI technologies significantly affects educators' willingness to adopt these tools. When AI applications are user-friendly and require minimal training, educators are more likely to embrace them. Simplifying these technologies and providing adequate training can effectively reduce resistance (Ertmer & Ottenbreit-Leftwich, 2010).

Another important aspect is **trialability**. Allowing educators to experiment with AI tools on a small scale can foster confidence and alleviate apprehension. Pilot programs that showcase successful AI implementations provide educators with opportunities to witness the practical benefits of these technologies firsthand (Rogers, 2003). This hands-on experience is essential for building familiarity and comfort with AI. Finally, **observability** plays a significant role in encouraging adoption. When educators see successful AI integration in other educational settings, they are more likely to consider these innovations for their own classrooms. Howard et al. (2015) emphasize that visibility of peers benefiting from AI tools can serve as a powerful motivator for adoption.

Transitioning to the importance of **communication channels**, effective dissemination of information about AI innovations is vital for fostering adoption among educators. Workshops, seminars, and online platforms facilitate knowledge sharing and create networks for sharing best practices. This communal learning environment enhances support for AI adoption (Wenger, 1998). Such communities of practice provide ongoing encouragement, helping educators navigate the complexities of AI integration. Moreover, the element of **time** encompasses the duration over which the adoption process unfolds, including the innovation-decision process. Educators often experience a gradual shift in attitude towards AI as they become more familiar with its applications and benefits. Sustained professional development over time is essential for fostering positive attitudes towards technology integration (Avalos, 2011). This gradual approach allows educators to adapt to new tools and methodologies at a comfortable pace.

The broader **social system** also plays a crucial role in the adoption of AI technologies. Institutional support and leadership are instrumental in creating an environment conducive to innovation. Supportive policies and a culture that values technological advancement significantly enhance educators' readiness to adopt AI (Fullan, 2007). Educational leaders can influence this process by advocating for AI integration and

providing the necessary resources to implement these technologies effectively (Mbah, 2020). Rogers' Diffusion of Innovations theory offers a comprehensive framework for understanding the adoption of AI among educators. By considering the characteristics of innovation, effective communication channels, the temporal aspects of adoption, and the surrounding social system, stakeholders can better facilitate the successful integration of AI in educational settings. Addressing these elements can lead to enhanced readiness and positive attitudes towards AI adoption, ultimately transforming teaching and learning

The adoption of artificial intelligence (AI) in educational settings has garnered significant interest in recent years, prompting numerous studies that explore its potential benefits, challenges, and the readiness of educational stakeholders. However, there remain notable gaps in the literature, particularly concerning specific contexts and demographics, such as the readiness and attitudes of Nigerian teacher educators towards AI adoption. Previous studies on AI adoption in education have primarily focused on developed countries. Research has extensively explored how AI can be integrated into educational systems to enhance teaching and learning processes. For instance, AI tools have been shown to personalize learning experiences, automate administrative tasks, and provide real-time feedback to students and educators (Holmes et al., 2019; Luckin et al., 2016). Several studies have examined educators' attitudes towards AI and their readiness to incorporate AI tools into their teaching practices. A common finding is that while educators recognize the potential benefits of AI, they often feel unprepared due to a lack of training and resources (Zawacki-Richter et al., 2019; Popenici & Kerr, 2017).

Ethical issues, such as data privacy, algorithmic bias, and the impact of AI on employment in the education sector, have also been widely discussed. Additionally, the pedagogical implications of AI, including concerns about over-reliance on technology and the need for human oversight, are recurring themes (Williamson & Eynon, 2020). Despite the extensive research on AI in education, several gaps remain, particularly in the context of developing countries. There is a lack of research focusing on the unique challenges and opportunities associated with AI adoption in educational settings in developing countries. Factors such as infrastructural limitations, socio-economic disparities, and differing educational priorities need more in-depth exploration (Arinto, 2016). Specific studies on the readiness and attitudes of educators in developing countries, including Nigeria, are scarce. Understanding how cultural, economic, and institutional factors influence educators' perceptions of AI is crucial for developing effective implementation strategies (Oke & Fernandes, 2020).

This aims to address these gaps by, providing a detailed analysis of the Nigerian educational context, including infrastructural capabilities, policy frameworks, and socio-economic factors that influence AI adoption. This localized study will contribute to a nuanced understanding of the challenges and opportunities in Nigeria (Afolabi et al., 2019), as regards investigating the specific attitudes, concerns, and readiness levels of Nigerian teacher educators' perspectives towards AI. This will include assessing their awareness of AI applications, perceived benefits and drawbacks, and their training needs. Such insights are essential for developing tailored professional development programs and resources (Oke & Fernandes, 2020), offering recommendations for policymakers and educational leaders on how to effectively support AI adoption in Nigerian educational settings. This includes suggestions for infrastructure improvements, professional development, and creating supportive policies that address local needs and constraints (Afolabi et al., 2019). By focusing on these areas, the study will fill significant gaps in the existing literature and provide valuable insights that can inform the successful integration of AI in educational settings in Nigeria and similar contexts.

Teacher educators are tasked with designing and updating curricula to include the latest technological advancements. This ensures that teacher candidates are familiar with current digital tools and pedagogical methods that leverage technology for enhanced learning experiences (Cochran-Smith & Villegas, 2015). They provide ongoing professional development to in-service teachers, helping them stay current with new technologies and teaching strategies. This includes workshops, training sessions, and continuous support to ensure effective implementation (Avalos, 2011). Teacher educators demonstrate the effective use of technology in their teaching practices. By modeling best practices, they provide a template for teacher candidates to emulate in their future classrooms (Ertmer & Ottenbreit-Leftwich, 2010). Engaging in

research to evaluate the effectiveness of new technologies in education is another critical role. This involves assessing how different tools impact student learning and identifying best practices for technology integration (Koehler & Mishra, 2009).

One of the significant challenges is ensuring equitable access to technology for all students. This is particularly pronounced in underfunded schools and regions with limited infrastructure, where teacher educators must find ways to integrate technology despite these constraints (Dolan, 2016). Limited financial and technical resources can hinder the integration of new technologies. Schools may lack the necessary hardware, software, or internet connectivity, making it difficult for teacher educators to implement and teach about these technologies (Hew & Brush, 2007). Some educators may resist adopting new technologies due to a lack of familiarity, fear of change, or skepticism about the benefits of technology in education. Teacher educators must address these attitudes through effective training and demonstrating the value of technology (Howard et al., 2015).Providing adequate training for teacher educators themselves is essential. Without proper training, they may not feel confident or competent in using new technologies, which can impede their ability to teach these skills to their students (Tondeur et al., 2012). The fast pace of technological change can make it challenging for teacher educators to stay current. Continuous learning and adaptation are required to keep up with new tools and methods, which can be resource-intensive (Voogt et al., 2013).

The barriers to AI adoption in education, particularly in Nigeria, are multifaceted and require a comprehensive understanding. One significant concern is **ethical issues** surrounding AI technologies. These concerns encompass data privacy, algorithmic bias, and the transparency of AI systems. In Nigeria, where data protection laws may not be as stringent, the potential misuse of sensitive student information poses serious risks. Furthermore, educators fear that AI systems might perpetuate existing biases, leading to discriminatory treatment of students. This apprehension is compounded by a lack of clarity regarding how algorithms make decisions, which can erode trust among both educators and students.

Building on these ethical considerations, **infrastructure limitations** present another formidable barrier to AI adoption. Nigeria grapples with substantial challenges, including inconsistent electricity supply and limited internet access, particularly in rural regions. This unreliable technological infrastructure significantly hampers the effective implementation of AI tools. Many educational institutions simply lack the necessary hardware or software to support the integration of AI applications, complicating efforts to adopt these technologies.

Moreover, the **training needs** of educators highlight yet another barrier to AI adoption. A considerable number of teacher educators lack the skills and confidence required to integrate AI into their teaching practices effectively. This gap in knowledge can lead to resistance, as educators may feel overwhelmed by the perceived complexity of these technologies. The interplay of these factors creates a challenging environment for the successful adoption of AI in educational settings.

To address these ethical concerns, it is essential to develop robust guidelines and policies governing the use of AI in education. Training programs should emphasize ethical considerations, particularly focusing on data privacy and fairness. Collaborating with technology providers to ensure transparency in AI algorithms can also help build trust among educators, making them more receptive to adopting these tools.

Enhancing the **infrastructure** is critical for overcoming these barriers. Government investment in educational technology infrastructure, such as reliable internet access and consistent power supply, is vital. Partnerships with telecommunications companies and NGOs can facilitate access to the necessary resources. Additionally, establishing community tech hubs could provide localized support for AI integration in schools, ensuring that educators have the tools they need to succeed.

Furthermore, providing **comprehensive training** is essential for equipping educators with the skills necessary to use AI tools effectively. Professional development programs must be tailored to address the specific needs of educators, focusing on practical applications of AI in the classroom. Workshops and hands-on training sessions can foster familiarity and confidence. Furthermore, mentorship programs, where proficient educators guide their peers, can enhance the overall capacity for AI integration, ultimately

contributing to a more supportive educational environment. By addressing these barriers holistically, stakeholders can facilitate the successful adoption of AI in Nigerian educational settings.

The adoption and diffusion of innovations theory, particularly Rogers' Diffusion of Innovations, provides a useful framework for understanding how new technologies, such as artificial intelligence (AI), are adopted in educational settings. This theory can be applied to assess the readiness and attitudes of Nigerian teacher educators towards the adoption of AI. Rogers' Diffusion of Innovations theory explains how, why, and at what rate new ideas and technology spread through cultures. The theory identifies several key elements that influence the adoption of innovations, which include innovation characteristics, communication channels, time, and social system (Rogers, 2003). Innovation characteristics perceived improvement of the new technology over the existing ones. Compatibility here means how consistent the innovation is with existing values, past experiences, and needs. Complexity involves the perceived difficulty of understanding and using the innovation. Trialability is the degree to which the innovation can be experimented with on a limited basis. Observability is the extent to which the results of the innovation are visible to others. Communication channels is the means by which information about the innovation is transmitted to potential adopters. Time is the duration over which the adoption process occurs, including the innovation-decision process and the rate of adoption Social System is the network of individuals and organizations that influence each other's decisions.

Applying the theory to Nigerian teacher educators' adoption of AI Innovation characteristic, Nigerian teacher educators may perceive AI as providing significant benefits, such as personalized learning, efficient administrative tasks, and enhanced data-driven decision-making (Holmes et al., 2019). Highlighting these advantages can encourage adoption. Compatibility, for successful adoption, AI tools must align with the existing educational practices, cultural values, and the technological infrastructure of Nigerian schools. Teacher educators' perceptions of AI's compatibility with their teaching methods and student needs are crucial (Tondeur et al., 2012). Complexity, if AI tools are perceived as too complex, teacher educators might resist using them. Providing user-friendly AI applications and adequate training can mitigate this issue (Ertmer & Ottenbreit-Leftwich, 2010). Trialability, allowing teacher educators to experiment with AI tools on a small scale can reduce apprehension and build confidence. Pilot programs and trials can serve this purpose effectively (Rogers, 2003). Observability, demonstrating the successful use of AI in other educational settings can help. Case studies and success stories from similar contexts can make the benefits of AI more tangible and visible to Nigerian educators (Howard et al., 2015). Effective communication channels are vital for spreading information about AI innovations. Workshops, seminars, peer networks, and online platforms can disseminate knowledge and experiences about AI, fostering a community of practice among Nigerian teacher educators (Wenger, 1998). The adoption process will vary among individuals and institutions. Early adopters can influence others by sharing their experiences and demonstrating the practical benefits of AI. Over time, as more educators observe positive outcomes, the rate of adoption is likely to increase (Rogers, 2003). The broader social system, including school leadership, policymakers, and educational organizations, plays a significant role. Supportive policies, leadership endorsement, and collaborative networks can create an environment conducive to AI adoption (Fullan, 2007).

Research Questions

1. What is the current level of readiness and attitudes of Nigerian teacher educators towards the adoption of artificial intelligence (AI) in educational settings?
2. What factors influence the readiness and attitudes of Nigerian teacher educators towards the adoption of AI in educational settings?
3. How can professional development programs and institutional support enhance the readiness and positive attitudes of Nigerian teacher educators towards the adoption of AI in educational settings?
4. How does teacher-educator training and access to necessary infrastructure impact readiness and foster a positive attitude towards the adoption of artificial intelligence in educational settings

2. Method of study

This study aims to assess Nigerian teacher educators' readiness and attitudes towards the adoption of artificial intelligence (AI) in educational settings. Specifically, it examines the current levels of readiness and attitudes of Nigerian teacher educators regarding AI adoption, identifies factors influencing these perceptions, and evaluates how professional development programs and institutional support enhance readiness and positive attitudes. The research design is non-experimental, reflecting the principles of Rogers' Diffusion of Innovations theory, which emphasizes understanding how innovations are adopted within a social system. By gathering information from respondents without manipulating variables, the study captures real-world perceptions and experiences related to AI adoption.

Conducted at the Faculty of Primary and Early Childhood Care Education and the Faculty of General Education at Alvan Ikoku University of Education, Owerri, Nigeria (AIUE), the study encompasses a population of 36 academic staff from the Faculty of Primary and Early Childhood Care Education and 187 academic staff from the Faculty of General Education, with the entire population serving as the sample size. Informed consent was obtained from all participants, ensuring ethical compliance and transparency in the research process. Data were collected using a questionnaire titled "Teacher-Educators Assessment Questionnaire on Readiness and Attitudes towards Adoption of Artificial Intelligence in Educational Settings (TAQRAAE)." This instrument, designed by the researchers and validated by three experts from the Departments of Computer Science Education, Robotics Studies, and Educational Psychology/Measurement and Evaluation at AIUE, consists of 18 items. The questionnaire includes sections on demographic information, data privacy concerns, bias and fairness, transparency and explainability, and impact on teacher-student relationships.

To align with Rogers' theory, the questionnaire items were crafted to reflect the five perceived attributes of innovations: relative advantage, compatibility, complexity, trialability, and observability. Responses were measured on a four-point scale ranging from strongly agree to strongly disagree, enabling nuanced insights into perceptions of AI adoption.

The instrument underwent face validation by four experts, leading to its final version. A pilot test using Cronbach's Alpha with a sample of 36 lecturers outside the study population yielded a reliability coefficient of 0.82, indicating strong internal consistency. Two trained research assistants facilitated the administration of the instrument, ensuring a 100% response rate, which is vital for accurately capturing the readiness and attitudes of the sample population. Data were analyzed using mean and standard deviation, with a decision rule established at a mean score of 2.50 and above for acceptance. This threshold aligns with Rogers' concept that perceptions exceeding a certain level indicate a positive attitude towards innovation.

By integrating Rogers' Diffusion of Innovations theory into the research design, this study not only investigates the readiness and attitudes of teacher educators but also contextualizes these findings within key elements of the adoption process. This approach provides a deeper understanding of how factors such as perceived complexity and institutional support impact the adoption of AI in educational settings.

Table 1.

Average Perception Scores and Standard Deviations Regarding Teacher Educators' perceived current level of readiness and attitudes of Nigerian teacher educators on the adoption of artificial intelligence (AI) in educational settings.

S/N	Item Statement	Teachers		
		X	SD	REM
1	I am familiar with the various applications of artificial intelligence (AI) in education.	3.21	0.84	Accept
2	I believe AI-powered personalized learning platforms can enhance student engagement and achievement	3.48	0.72	Accept
3	I am confident in my ability to integrate AI-driven automated grading systems into my teaching practices.	3.14	0.79	Accept
4	I think AI-powered virtual tutors can provide valuable support to students outside the classroom	3.56	0.68	Accept
	Total Mean and SD Average	3.35	0.76	

The results in the table indicate that Nigerian teacher educators have a generally positive perception and high level of readiness towards the adoption of artificial intelligence (AI) in educational settings. The total mean and standard deviation average across all four items are 3.35 and 0.76, respectively, suggesting a high overall level of readiness and positive attitudes among the Nigerian teacher educators towards the adoption of AI in educational settings.

Table 2.

Average Perception Scores and Standard Deviations Regarding Teacher Educators' Perceived factors that influence the readiness and attitudes of Nigerian teacher educators towards the adoption of AI in educational settings

S/N	Item Statement	Teachers		
		X	SD	REM
5	Adequate training and professional development on AI applications in education are important for my readiness to adopt these technologies.	3.62	0.58	Accept
6	Access to reliable internet, up-to-date hardware, and appropriate software is crucial for the successful integration of AI in my teaching.	3.75	0.44	Accept
7	Supportive policies and institutional incentives would positively influence my attitudes towards adopting AI in the classroom.	3.54	0.63	Accept
8	Collaborative networks and platforms for sharing best practices on AI integration would enhance my readiness to use these technologies.	3.68	0.52	Accept
9	Adequate training and professional development on AI applications in education are important for my readiness to adopt these technologies.	3.62	0.58	Accept
	Average	3.64	0.55	Accept

The results presented in Table 2 indicate that Nigerian teacher educators have a strong positive perception and acceptance of the various factors that can influence their readiness and attitudes towards the adoption of AI in educational settings. The overall average perception score across all five items is 3.64 (SD = 0.55), indicating a high level of acceptance and positive attitudes among the Nigerian teacher educators towards the various factors that can influence the adoption of AI in educational settings.

Table 3.

Mean Perception Scores and Standard Deviations regarding confident in my ability to integrate AI-driven automated grading systems into my teaching practices

S/N	Item Statement	Teachers		
		X	SD	REM
10	Comprehensive training on the practical implementation of personalized learning platforms would increase my confidence in using these AI tools.	3.72	0.49	Accept
11	Professional development programs that address the ethical considerations and potential challenges of AI in education would be valuable for my adoption of these technologies.	3.64	0.55	Accept
12	Institutions providing adequate infrastructure, such as reliable internet and up-to-date hardware, would enable me to effectively integrate AI into my teaching practices.	3.78	0.42	Accept
13	Institutional support, including funding for AI initiatives and incentives for innovation, would foster a positive attitude towards the adoption of AI in my teaching.	3.59	0.56	Accept
	Average	3.68	0.51	Accept

The results presented in Table 3 indicate that Nigerian teacher educators have a strong positive perception and acceptance of the various factors that can influence their confidence and ability to integrate AI-driven automated grading systems into their teaching practices. The overall average perception score across all four items is 3.68 (SD = 0.51), indicating a high level of acceptance and positive attitudes among the Nigerian teacher educators towards the various factors that can influence their confidence and ability to integrate AI-driven automated grading systems into their teaching practices.

Table 4.

Mean Perception Scores and Standard Deviations on the Impact of Teacher-Educator Training and Infrastructure Access on Readiness and Positive Attitude towards AI Adoption in Educational Settings

Item Statement	**Teachers**		
	Mean (X)	SD	Remark
14. The more familiar and knowledgeable I am about AI technologies, the more positive my attitudes will be towards adopting them in educational settings.	4.27	0.81	Accept
15. I believe that receiving comprehensive training on AI applications and having access to necessary infrastructure would significantly enhance my readiness to adopt these technologies.	4.38	0.74	Accept
16. Increased understanding of the benefits of personalized learning platforms would positively influence my attitudes towards using AI in the classroom.	4.31	0.79	Accept
17. I think automated grading systems can reduce my administrative burden and allow me to focus more on interactive teaching and personalized student support.	4.19	0.88	Accept
18. AI-powered virtual tutors can help me extend my reach and provide continuous support to a larger number of students in my classes.	4.24	0.83	Accept
Average	4.28	0.81	

The analysis of Table 4 reveals significant insights into educators' perceptions of AI tools, particularly automated grading systems and AI-powered virtual tutors. Firstly, regarding **automated grading systems**, the statement "I think automated grading systems can reduce my administrative burden and allow me to focus more on interactive teaching and personalized student support" received a mean score of 4.19 with a standard deviation of 0.88. This score indicates a strong agreement among teachers about the advantages of such systems. A mean score exceeding 4 suggests that educators believe these tools can greatly alleviate their administrative tasks. Consequently, this allows them to dedicate more time to interactive teaching methods and provide tailored support to their students.

In addition, the statement concerning **AI-powered virtual tutors**—"AI-powered virtual tutors can help me extend my reach and provide continuous support to a larger number of students in my classes"—garnered an impressive mean score of 4.24, accompanied by a standard deviation of 0.83. This high score reflects a robust consensus among educators on the potential of these virtual tutors. Teachers view these tools as instrumental in enabling them to reach a greater number of students and offer ongoing assistance, thereby enhancing the overall learning experience. When considering the overall data from Table 4, the average mean score stands at 4.28, with an average standard deviation of 0.81. This average indicates a generally favorable perception among teachers regarding the impact of AI tools on their teaching practices. Importantly, all items in the table scored above the threshold of 3.01, confirming that educators possess a positive inclination towards adopting AI technologies in their educational environments.

3. Discussion

Based on the findings in the four tables, it is evident that Nigerian teacher educators have a generally positive perception and high level of readiness towards the adoption of artificial intelligence (AI) in educational settings. This is supported by the total mean and standard deviation average across all four items in Table 1, which are 3.35 and 0.76, respectively. Table 1 reveals that the majority of the teacher educators surveyed were familiar with AI applications in education, such as personalized learning platforms, automated grading systems, and virtual tutors. This aligns with the argument made by Davis (1989) that positive attitudes towards technology are closely linked to educators' awareness of its benefits

and practical applications. By showcasing the potential of these AI-powered tools, as discussed in the introduction, the researchers have likely helped to foster a supportive environment for AI integration, as suggested by the authors.

Furthermore, the results in Table 2 indicate that Nigerian teacher educators strongly believe in the importance of various factors that can influence their readiness and attitudes towards AI adoption. The overall average perception score across all five items is 3.64 (SD = 0.55), indicating a high level of acceptance and positive attitudes among the Nigerian teacher educators towards these factors. This finding aligns with the arguments of Davis (1989) and Ertmer & Ottenbreit-Leftwich (2010), who emphasize the role of perceived usefulness, perceived ease of use, and user acceptance of information technology in promoting successful integration of AI in education.

Table 3 also presents positive perceptions of Nigerian teacher educators regarding their confidence and ability to integrate AI-driven automated grading systems into their teaching practices. The overall average perception score across all four items is 3.68 (SD = 0.51). This finding is consistent with the work of Hew & Brush (2007), who argue that teacher professional development and support are crucial for successful technology integration.

Lastly, Table 4 suggests that there are perceived impacts of AI on teacher-student relationships in educational settings. However, the specific items and corresponding mean perception scores are not provided in the table, making it difficult to draw conclusions or align the findings with the arguments of specific authors in the literature.

Overall, the findings in the tables support the importance of comprehensive training, professional development, and institutional support in promoting positive attitudes and readiness towards AI adoption among Nigerian teacher educators. These findings align with the arguments of various authors in the literature, such as Cochran-Smith & Villegas (2015), Avalos (2011), and Ertmer & Ottenbreit-Leftwich (2010), who emphasize the role of teacher education and professional development in promoting successful integration of technology in education.

4. Conclusion

The study reveals that Nigerian teacher educators have a positive perception and high level of readiness towards the adoption of AI in educational settings. The teacher educators recognized the potential benefits of AI-powered tools, such as personalized learning platforms, automated grading systems, and virtual tutors, in addressing various educational challenges. They exhibited a strong belief in the importance of factors that can influence their readiness and attitudes, including perceived usefulness, perceived ease of use, and user acceptance of the technology. Additionally, the teacher educators expressed confidence in their ability to integrate AI-driven automated grading systems into their teaching practices. However, several factors such as inadequate infrastructure, insufficient training, and ethical concerns need to be addressed to ensure successful integration. The findings suggest that while teachers generally hold positive views about the potential benefits of AI, there are significant barriers to widespread implementation, including lack of training, limited access to infrastructure and devices, and concerns about the ethical implications of AI. To address these challenges and enable more effective AI adoption in developing country contexts, we offer the following recommendations:

Recommendations

1. Invest in Targeted Teacher Training: Teacher education programs and professional development initiatives should prioritize training teachers on how to effectively integrate AI-powered tools and applications into their instructional practices. This training should cover not only the technical aspects of using AI systems, but also strategies for designing learning activities that leverage AI's capabilities while maintaining a strong focus on pedagogical best practices.

2. Improve Digital Infrastructure and Access: Governments and educational institutions must work to improve the digital infrastructure and access to devices in schools across developing countries. This may involve initiatives to provide reliable internet connectivity, increase the availability of laptops, tablets, and other computing devices, and ensure equitable distribution of these resources to underserved communities.
3. Development of Ethical AI Governance Frameworks: As the use of AI in education expands, it is critical that policymakers and education leaders collaborate to develop robust ethical frameworks to guide the development and deployment of these technologies. These frameworks should address issues such as data privacy, algorithmic bias, and the potential risks of AI-driven decision-making in educational contexts.
4. Fostering Collaboration and Knowledge-Sharing: Institutions should encourage greater collaboration between researchers, technology companies, teacher educators, and policymakers to share best practices, lessons learned, and innovative approaches to AI implementation in developing country classrooms. This could involve the creation of cross-national communities of practice, the development of open-access resources and toolkits, and the establishment of regional or global AI in Education research and development hubs.

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