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ENHANCING LANGUAGE LEARNING IN NIGERIA: THE POTENTIALS OF ARTIFICIAL INTELLIGENCE IN MODERN PEDAGOGY

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ABSTRACT

This paper investigates the transformative potential of Artificial Intelligence (AI) in enhancing language learning within the Nigerian educational context, characterized by its complex linguistic landscape and diverse learner demographics. As traditional pedagogical approaches often fail to meet the individualized needs of students, AI technologies - encompassing personalised learning platforms, intelligent tutoring systems, chatbots, and virtual assistants -emerge as effective solutions to enhance engagement, accessibility, and instructional efficacy. This article hinges on three theories: Constructivism, Connectivism, and the Technological Pedagogical Content Knowledge (TPACK) framework. Employing a qualitative methodology grounded in a comprehensive review of secondary literature, this study identifies five major themes: personalised and adaptive learning, accessibility and scalability, real-time feedback and autonomous learning, interactive and contextualised learning environments, and the necessity of ethical frameworks and educator preparedness. While AI offers significant benefits such as real-time feedback and the capacity for personalised instruction, challenges concerning digital divide, data privacy, and algorithmic bias necessitate careful scrutiny and responsible implementation. This study advocates for a collaborative approach involving educators, policymakers, and technology developers to optimise AI applications in language education. Through targeted investments, training, and ethical considerations, Nigeria can harness AI's capabilities to create an inclusive and dynamic language learning environment, thus providing linguistic proficiency and contributing to the country's socio-economic advancement.

KEYWORDS: Artificial Intelligence (AI), language learning, traditional pedagogy, Learning Management System (LMS), modern pedagogy, Nigeria.

INTRODUCTION

In an era characterised by unprecedented technological advancement, the field of education is undergoing great transformation, particularly in the area of language learning. Traditional paradigms of language pedagogy are increasingly supplemented - and at times challenged - by the integration of artificial intelligence (AI). With applications ranging from personalised learning experiences to intelligent tutoring systems, AI presents innovative methodologies capable of addressing the diverse needs of learners across various contexts.

This paper delineates the multifaceted ways in which AI is reshaping language pedagogy, equipping educators with novel tools designed to enhance engagement, efficiency, and effectiveness in language instruction.

As globalisation continues to expand the demand for multilingualism, language education must adapt to meet the challenges posed by increasingly heterogeneous student demographics, divergent learning styles, and varying proficiency levels. Traditional education methods often falter in providing individualised support, leading to disengagement and suboptimal educational outcomes, particularly in the context of complex conceptual learning, where difficulties are an unavoidable yet essential part of the learning process. Furthermore, these methods may not enable students to explore their unique interests, which are vital for nurturing a sense of purpose and motivation in their educational journeys. A more personalised and flexible approach to education is necessary to accommodate diverse learning needs and inspire meaningful engagement (Lodge, Kennedy, Lockyer, Arguel, and Pachman, 2018). In contrast, AI-driven solutions have the potential to create adaptive learning environments that respond in real-time to a learner's progress, preferences, and challenges. Through sophisticated data analysis and machine learning algorithms, these systems tend to yield insights that were previously unattainable, thereby supporting not only the acquisition of vocabulary and grammar but also the development of critical communicative competencies (Wang, Wang, Zhu, Wang, Tran, & Du, 2024).

Furthermore, the interactive capabilities of AI contribute to the creation of rich, immersive experiences that simulate authentic language use. For instance, virtual language partners and intelligent conversation simulators provide contextualized opportunities for practice, giving a more meaningful engagement with the language being learned (Godwin-Jones, 2018). Such advancements create environments conducive to not just rote learning but also genuine conversational practice, enhancing learners' ability to navigate real-world communicative scenarios.

In addressing the intersection of artificial intelligence and language education, this paper aims to illuminate the transformative possibilities inherent in these technologies, while also acknowledging the challenges and ethical considerations associated with their deployment. It is essential to interrogate the implications of integrating AI into language pedagogy, considering potential biases and the necessity for equitable access to technology (Selwyn, 2019). This assessment seeks to contribute to a more nuanced understanding of how AI can enrich language education, equipping learners with the skills necessary for effective communication in an increasingly interconnected world. This paper shows the way for more informed and responsible practices in the incorporation of AI within language pedagogy as it assesses current developments and future prospects.

Authors have contributed significantly to the discourse on language learning and the role of artificial intelligence (AI) in modern pedagogy, with clear indications of their positions on this issue (Archambault & Crippen, 2009; Essel, Vlachopoulos, Tachie-Menson, Johnson, & Baah, 2022; Gutiérrez, 2023); Chiu, Moorhouse, Chai & Ismailov, 2024; Haryanto, Guilin, Jiao, Wang, & Sudirman, 2024). Garry Kasparov while primarily known as a chess grandmaster, engaged deeply with AI's influence on learning and education. In his (2017) book ‘Deep Thinking: Where Machine Intelligence Ends and Human Creativity Begins’, he argues that AI can enhance human capabilities, including language learning. Kasparov posits that AI tools can supplement traditional pedagogical methods by providing personalised feedback and providing an environment that encourages creative thinking in language acquisition.

Wongmahesak, Fazida Karim, and Wongchestha (2024) assert that AI-powered adaptive learning platforms and intelligent tutoring systems offer robust assistance for remote

and hybrid learning models. They advocate for the adoption of AI technologies as catalysts for enhanced interaction and engagement in language acquisition. Gee (2003) discusses how AI-enabled platforms can create immersive experiences that mirror real-world communication, thereby increasing learners' confidence and competency. However, other authors, much as they have touted the use of AIs in language pedagogy, they have also called for caution in its application. Godwin-Jones (2018) analyse the benefits and challenges of incorporating AI into language education and argues that AI technologies provide adaptive learning experiences tailored to the individual, but emphasises the need for educators to critically evaluate these tools to ensure that they complement pedagogical goals rather than supplant them.

Similarly, Malhotra & Desai (2022); Desai, Patil, Patil, & Mehta (2023) in their work explained that Generative Artificial Intelligence (GAI) defined as an AI that can learn, understand, and perform a wide range of tasks across various domains and contexts is, unlike narrow AI, excels in specific tasks like image recognition because general artificial intelligence aims to replicate human-like cognitive abilities and in this, lies ethical concerns in its application. However, Godwin-Jones (2024) notes that Generative AI offers significant opportunities for language learning, as tools like ChatGPT facilitate second language practice through engaging chats in written or spoken formats. Godwin-Jones asserts that these tools can enhance vocabulary acquisition, improve conversational skills, and build confidence in language use because it allows learners to converse in real time, receive instant feedback, and explore diverse topics. Furthermore, AI-driven platforms tailor learning experiences to individual needs, making language acquisition more accessible and enjoyable for learners at all levels.

However, both GAI and other large language models are double-edged swords because they offer remarkable capabilities but also raise ethical concerns and challenges related to misuse and bias. In spite of the awareness and recognition of AI in Language pedagogy, not much have been said about this concept in the African setting, particularly in Nigeria. The overarching question is this: What is the role of Artificial Intelligence in Language Learning in Nigeria? One is not sure especially against the background of the country's complex linguistic landscape and diverse learner demographics, and match towards digital literacy. This paper therefore, examines the potential of Artificial Intelligence in Language Learning in Nigeria? To achieve this aim, this article is divided into five sections which includes the theoretical framework on which this study rests, a conceptual review that includes the potential of AI in language pedagogy, applications - ranging from chatbots and virtual assistants to sophisticated language learning platforms - and their implications for educators and learners alike; method applied in the study; themes or findings from the reviewed literature and discussion; before the conclusion and recommendation.

THEORETICAL FRAMEWORK

The integration of artificial intelligence (AI) in language learning and teaching can be understood through various theoretical lenses that inform modern pedagogical practices. This framework draws upon three primary theories: Constructivism, Connectivism, and the Technological Pedagogical Content Knowledge (TPACK) framework. Each of these theories provides insights into how AI can enhance language pedagogy, particularly in the Nigerian context.

CONSTRUCTIVISM

Constructivist theory posits that learners construct knowledge through experiences and interactions with their environment (Piaget, 1972; Vygotsky, 1978). In language learning,

this approach emphasises active engagement, problem-solving, and collaboration. AI tools can facilitate constructivist learning environments by providing personalised feedback and adaptive learning pathways that cater to individual students' needs and learning paces. For instance, intelligent tutoring systems can analyse learners' progress and deliver customised exercises, thereby promoting deeper engagement and understanding (Kukulska-Hulme, 2012).

CONNECTIVISM

Connectivism, proposed by Siemens (2005), emphasises the interconnectedness of knowledge acquisition, stating that learning occurs across a network of information sources and social interactions. This theory is particularly relevant in the digital age, where AI technologies can facilitate connections between learners, educators, and resources globally. In Nigeria, AI can bridge gaps in access to quality language instruction by connecting students with native speakers and diverse learning resources online. For example, language learning applications powered by AI can provide collaborative learning through platforms that enable students to interact with peers from different cultural backgrounds, enhancing their linguistic and cultural competencies (Oduor, 2017).

TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE (TPACK)

The TPACK framework, developed by Mishra and Koehler (2006), emphasises the intersection of technology, pedagogy, and content knowledge. It serves as a guide for teachers to integrate technology effectively into their pedagogical practices. In the context of language learning in Nigeria, this framework highlights the importance of training educators to utilise AI tools not only as supplementary resources but as integral components of their teaching strategies. Teachers are better prepared to leverage AI in ways that enhance learner engagement and instructional effectiveness when they are equipped with TPACK, while addressing the specific linguistic and cultural needs of their students (Archambault & Crippen, 2009).

This theoretical framework situates the integration of AI in language learning within broader educational theories that emphasise active, interconnected, and technologically-informed practices. The article highlights the potential benefits and challenges of utilising AI in language pedagogy in Nigeria as it applies Constructivism, Connectivism, and the TPACK framework in advocating for strategies that maximise learner engagement and educational outcomes in an increasingly digital landscape.

CONCEPTUAL REVIEW: AI AND LANGUAGE PEDAGOGY

The advent of Artificial Intelligence (AI) has catalysed transformative shifts across various domains, markedly altering traditional paradigms in education. Among these, language pedagogy - encompassing both theory and practice in the teaching of languages - emerges as a particularly fertile ground for the application of AI technologies. This conceptual review examines the convergence of AI and language pedagogy, focusing specifically on its ramifications for language acquisition in the Nigerian context.

Artificial Intelligence is defined as the capability of machines to simulate cognitive functions traditionally associated with human intelligence, notably within computer systems (Russell & Norvig, 2016). In language education, AI assumes an important role by facilitating customised learning experiences, offering instantaneous feedback, and providing an expansive repository of linguistic resources. Intelligent Tutoring Systems (ITS) epitomise this function, adapting to individual learners' needs by analysing their performances and personalising instructional content to address particular challenges (VanLehn, 2011). This

tailored approach not only enhances learner engagement but also cultivates an understanding of language structures and practical usage. This leads logically to the benefits of AI-inherent language pedagogy. The following are some of the major benefits:

POTENTIAL OF AI IN LANGUAGE PEDAGOGY

Artificial Intelligence is defined as the capability of machines to simulate cognitive functions traditionally associated with human intelligence, notably within computer systems (Russell & Norvig, 2016). In language education, AI assumes an important role by facilitating customised learning experiences, offering instantaneous feedback, and providing an expansive repository of linguistic resources. Intelligent Tutoring Systems (ITS) epitomise this function, adapting to individual learners' needs by analysing their performances and personalising instructional content to address particular challenges (VanLehn, 2011). This tailored approach not only enhances learner engagement but also cultivates a major understanding of language structures and practical usage.

BENEFITS OF AI-ENHANCED LANGUAGE PEDAGOGY

- **Personalisation and Adaptively:** A principal advantage of AI in language pedagogy lies in its capacity to customise learning pathways. AI platforms can assess learners' strengths and weaknesses through diagnostic evaluations, enabling the creation of tailored curricula that align with individual learning styles and paces. This feature is especially important in Nigeria's diverse linguistic environment, where students may exhibit different levels of proficiency in English and various indigenous languages. Educators can pinpoint students' specific abilities and challenges by administering diagnostic assessments and placement tests. This targeted approach not only helps in personalising learning experiences but also provides a more inclusive educational environment, where each learner receives the support, they need to thrive(Jegede, 2024).. It allows for the development of strategies that address language barriers, thereby enhancing total academic performance and engagement among all students
- **Scalability and Accessibility**: AI-driven language education technologies are implemented on a substantial scale, thus increasing the accessibility of language resources to a broader demographic in Nigeria, including those residing in remote and underserved regions. Mobile applications and online platforms empowered by AI deliver high-quality language instruction without necessitating a physical classroom setting. This democratisation of language education may significantly elevate literacy rates and enhance communication competencies nationwide (Ngalim, 2014).
- **Immediate Feedback and Support:** AI technologies can offer immediate feedback regarding learners' performances. Many language students grapple with difficulties in pronunciation, grammar, and vocabulary usage. Tools equipped with natural language processing capabilities can provide real-time feedback on both written and spoken language, allowing learners to promptly rectify errors and accelerate their learning process. This feature promotes continuous practice and refinement, which are critical components of language acquisition (Kukulska-Hulme, 2012).
- **Engagement Through Gamification:** Furthermore, AI augment learner engagement through gamified experiences in language learning. The integration of game-like mechanics—such as rewards, levels, and challenges - encourage active participation in language studies. This method has demonstrated efficacy in sustaining interest and persistence among learners, particularly younger students, who may feel disenchanted by conventional instructional methods (Gee, 2003). Gee (2003) conducted studies that

demonstrate how educational games replicate real-world situations, prompting students to engage in critical thinking and problem-solving. These games provide a deeper understanding of complex concepts by immersing learners in interactive environments that mimic authentic challenges. Gee's research highlights that when students are placed in scenarios requiring decision-making and collaboration, they not only enhance their knowledge but also develop essential skills such as teamwork, adaptability, and resilience. Consequently, AI driven educational games serve as powerful tools for bridging theoretical knowledge and practical application, preparing students for real-life situations they will encounter beyond the classroom.

CHALLENGES AND CONSIDERATIONS

Nevertheless, the benefits and promise of AI in language pedagogy is accompanied by numerous challenges that must be addressed to enable effective implementation within Nigeria. Key issues include limited access to technology, insufficient infrastructural development, and varying levels of digital literacy, all of which may impede the integration of AI tools into language education. Additionally, there exists a pressing need for comprehensive educator training to ensure that teachers are equipped to incorporate AI into their pedagogical approaches effectively (Yakubu, 2024). This is because AI in teacher training and professional development has become very important for educational institutions aiming to effectively equip educators with the necessary skills and knowledge to navigate the evolving landscape of technology, thereby enabling them to position themselves as leaders in the digital age (Yakubu, 2024). However, ethical considerations surrounding data privacy and potential algorithmic biases inherent in AI systems necessitate meticulous scrutiny (Binns, 2018). It is imperative that AI tools are designed to be inclusive and culturally responsive to create equitable learning environments for all Nigerian students.

APPLICATIONS: CHATBOTS, VIRTUAL ASSISTANTS, LANGUAGE LEARNING PLATFORMS - AND THEIR IMPLICATIONS FOR EDUCATORS

The Rise of Artificial Intelligence (AI) has spawned transformative applications that have the potential to significantly enhance language education. In Nigeria, where second language (L2) acquisition is important to effective communication and educational success, AI-driven tools such as chatbots, virtual assistants, and specialised language learning platforms have emerged as innovative resources for engaging learners and supporting educators. This section critically examines these AI applications and discusses their implications for educators, highlighting the transformative potential they hold for language pedagogy.

- **Chatbots in Language Learning:** Chatbots are AI-powered programs designed to simulate conversation through text or voice interactions. Within the ambit of language education, chatbots serve several important functions. First, they offer learners a venue for conversational practice in a low-pressure environment. Engaging with chatbots allows students to receive immediate feedback on grammar, vocabulary, and pronunciation, thereby building confidence and fluency without the anxiety that may accompany interactions with peers or instructors (Son, Ružić, & Philpott, 2023; Gutiérrez, 2023). Furthermore, many chatbot platforms can personalise the learning experience by adapting to the user's proficiency level, presenting dialogue that aligns with their specific learning needs. AI-based chatbots offer a flexible and interactive approach to language learning, stimulating effective communication skills, as shown in a recent study highlighting their positive impact on learner engagement and

retention (Cislowska & Pena-Acuna, 2024). As learners progress, chatbots can introduce more complex language structures and themes, ensuring that content remains relevant and engaging. This adaptive learning model not only helps students grasp advanced concepts but also allows them to practice real-life conversations, reinforcing their confidence and fluency in the target language. Furthermore, the 24/7 availability of chatbots provides learners with the opportunity to practice at their own pace, further enhancing their language acquisition experience (Cislowska & Pena-Acuna, 2024). Accessibility is another significant benefit of chatbots; they can be accessed 24/7, providing learners with the flexibility to practice language skills outside traditional classroom hours. The integration of chatbots in education offers numerous advantages, including immediate assistance, quick access to information, and enhanced learning outcomes. With chatbots, students engage in conversational practice anytime, allowing them to improve their language skills at their own convenience. This continuous availability helps students build confidence as they practice speaking and writing in a low-pressure environment (Labadze, Grigolia, and Machaidze, 2023). Such flexibility is particularly significant in a diverse educational landscape as Nigeria, where students often have varying schedules and commitments. However, the integration of chatbots into the curriculum poses challenges for educators. Teachers must contemplate how to effectively incorporate these tools into their teaching strategies. Chatbots can be employed as supplementary resources for homework, revision, or conversational skills assessment. To maximise their effectiveness, educators must also understand the limitations of chatbots, ensuring that they can provide necessary context and corrections when required (Yakubu, 2024).

- **Virtual Assistants:** Virtual assistants - such as Google Assistant, Amazon Alexa, and Apple Siri - possess the potential to revolutionise language learning through interactive experiences facilitated by voice recognition and natural language processing. These technologies create more dynamic learning experiences compared to traditional methods. For example, students can engage with virtual assistants to ask questions, practice pronunciation, and receive explanations of language rules, which contributes to a more engaging learning environment. A study by Essel (2022) found that students who interacted with virtual assistants and chatbots performed better academically compared to those who used other forms of support. Also, virtual assistants support task-based language learning by guiding students through specific activities, such as planning a trip or conducting a research project. This practical application of language skills contextualises the learning experience, reinforcing the acquisition of functional language in real-world scenarios. The integration of task-based language teaching (TBLT) and virtual learning environments (VLEs) has shown great potential in improving students' learning outcomes by providing interactive and immersive learning experiences. These technologies facilitate personalised feedback and adaptive learning pathways that cater to individual student needs, ensuring that each learner can progress at their own pace. Furthermore, VLEs enable collaborative learning opportunities, allowing students to engage with peers from diverse backgrounds, thereby enhancing their cultural understanding and communicative competence. This combination of TBLT and virtual assistive technology not only enriches the learning experience but also provides greater motivation and engagement among students, leading to improved language proficiency and confidence in their abilities (Wiboolyasarin, 2023). Additionally, the multimodal capabilities of these technologies, which combine voice commands with visual aids, cater to diverse learning styles, thus enhancing comprehension for

students with varying preferences (Koehler & Mishra, 2009). Educators are tasked with creatively integrating virtual assistants into their lesson plans by designing activities that enable students to use these tools for information retrieval and problem-solving. This approach not only stimulate independent learning but also highlights the importance of critical thinking. Teachers play a very important role in guiding students to validate the information obtained through these interactions. Alam & Mohanty (2023) note that to enhance students' understanding and problem-solving abilities, educators and institutions must navigate the complexities of developing essential skills such as problem identification, decision-making, and critical analysis. Rather than merely comply with directions it is important to ensure that students engage with the information actively and thoughtfully, from the various tools that have been developed to encourage students to tackle problems effectively, and helping them to become more adept at identifying challenges and crafting solutions (Kim & Hannafin, 2011; Alam, & Mohanty. 2023).

- **Language Learning Platforms:** AI-driven language learning platforms, including Duolingo, Babbel, and Rosetta Stone, offer structured approaches to language acquisition, combining various educational methodologies and technologies such as gamification, spaced repetition, and adaptive learning algorithms. Gamification elements, such as points, rewards, and challenges, incentivise learners, making language education enjoyable and motivating them to engage consistently with the material (Kapp, 2012). Furthermore, these platforms utilise algorithms to assess learner progress and adapt content accordingly. If a student struggles with specific topics, the system can provide targeted exercises or resources to reinforce understanding and this imply that technology can now reintegrate learning and assessment by utilising real-time data and feedback to enhance the educational experience. This innovative approach helps students grasp concepts more effectively, empowers teachers to tailor their instruction to meet individual needs, and supports educational institutions in nurturing an environment of continuous improvement (OECD, 2021). Additionally, the incorporation of rich multimedia content - such as audio, video, and visual aids - enhances comprehension and retention by addressing varied learning styles, providing necessary context for language use. While language use and learning platforms present valuable resources, educators should adopt a complementary stance, utilising these tools in conjunction with traditional teaching methods rather than as substitutes. Educators can assign these platforms for homework, facilitate self-study, or incorporate them as supplemental materials in classroom instruction. However, it is imperative for teachers to encourage reflective practices, advising students to integrate their learning into real-life communication scenarios (Stockwell, 2013).

IMPLICATIONS AI APPLICATIONS FOR EDUCATORS

The ongoing evolution of Artificial Intelligence (AI) technologies brings about significant transformations in the educational landscape, particularly within the context of language learning in Nigeria. The emergence of AI-driven applications such as chatbots, virtual assistants, and specialised language platforms not only impacts educators' approaches to teaching but also offers an array of opportunities to enhance both teaching and learning. This section examines the implications of these technologies for educators, emphasising the need for adaptation and consideration of ethical practices.

As education evolves with AI integration, the role of educators is poised for redefinition. No longer serving merely as transmitters of knowledge, teachers now transition into facilitators and guides in the learning process. With AI tools capable of providing basic language instruction and instantaneous feedback, educators can redirect their efforts towards providing critical thinking, problem-solving abilities, and cultural awareness within language contexts (García, 2019). Additionally, AI systems enable personalised learning pathways that accommodate diverse student needs. Chiu, Moorhouse, Chai, & Ismailov (2024) emphasise that educators can effectively monitor individual student progress and customise their strategies by analysing performance data generated through AI. This approach will enhance academic achievement by mediating and supporting learning with AI technologies. Furthermore, AI applications enhance collaborative learning by connecting students with peers and language partners across geographical boundaries, creating opportunities for educators to supervise teamwork and intercultural communication, thereby enriching the educational experience (Xia, Shin, & Kim, 2024).

To effectively leverage AI technologies, educators must embrace continuous professional development. This involves gaining proficiency with various AI tools and understanding their functionalities. Training programs should emphasise the integration of these technologies into teaching practices while keeping educators informed about emerging trends in AI applications (Ning, Zhang, Xu, Zhou, & Wijaya, 2024). Alongside technological proficiency, educators must adapt their pedagogical strategies to suit AI-enhanced learning environments. This adaptation requires that teachers develop lesson plans that blend traditional methodologies with AI tools, optimising their potential to maintain engagement and effectiveness in language instruction (Hwang, & Fu, 2020). Furthermore, as AI systems generate analytics on student performance, data literacy becomes an essential skill for educators. Wang, Wang, Zhu, Wang, Tran, and Du (2024) assert that teachers can make informed instructional decisions that ultimately improve student outcomes when they interpret and use this information effectively.

However, the integration of AI in education brings forth important ethical considerations that educators must traverse. Equity and inclusivity are paramount, as educators must ensure all students have access to the necessary resources to benefit from AI technologies. Addressing the digital divide, particularly in underserved regions like Nigeria, is important for creating equitable educational opportunities (Tay et al., 2020). Data privacy and security also require educators' attention, as AI tools often collect and analyse sensitive student data. It is vital for educators to prioritise ethical practices regarding data usage, ensuring confidentiality and adherence to data protection regulations (Binns, 2018). In addition, educators should seriously evaluate the AI applications they choose to implement. AI algorithms may inadvertently reinforce biases present in their training data; thus, it is essential to select tools that reflect the diverse and multifaceted linguistic landscape of the region (Noble, 2018).

AI applications provides an environment in which students can take greater responsibility for their own language acquisition. Educators play a vital role in promoting this shift towards self-regulated learning. Students can be encouraged by educators to engage in self-directed study and assisted in developing strategies for effective utilisation of these tools by integrating AI-driven language learning platforms and chatbots (Son, Ružić, & Philpott, 2023; Gutiérrez, 2023). Teachers can support reflective practices by guiding students in evaluating their learning experiences through AI applications, encouraging them to set personal goals and adapt their learning strategies in response to feedback (Baker & Inventado, 2014). AI technology serves as a catalyst for collaborative learning projects that

not only enhance language skills but also cultivate interpersonal abilities and critical discussions around language use and cultural nuances.

The implications of AI applications for educators in Nigeria's language learning context are multifaceted and transformative. Embracing these technologies allows educators to redefine their roles, enhance their professional competencies, and create more engaging and inclusive learning environments. Nevertheless, educators must carefully steer the ethical dimensions and potential challenges associated with integrating AI. As they adapt to this evolving educational landscape, the ability to harmonise AI tools with traditional pedagogical practices will be essential for creating effective and impactful language learning experiences for all students. Through collaborative efforts, ongoing professional development, and a steadfast commitment to ethical considerations, educators can harness the immense potential of AI to enrich language education in Nigeria.

METHOD

This study employs a qualitative research methodology, focusing on the use of secondary data to investigate the potential of Artificial Intelligence (AI) in enhancing language learning in Nigeria. The primary objective of this research is to provide a nuanced comprehension of how AI applications can be integrated into contemporary pedagogical practices and to explore the implications of such integration for both educators and learners. The methodology adopted in this study encompasses several key components, detailed hereafter. Data collection for this study relies exclusively on secondary sources obtained from a diverse range of academic and non-academic literature. Organised literature review was conducted to explore existing research concerning AI applications in education, with particular emphasis on language learning. This review incorporated peer-reviewed journal articles, conference papers, and academic theses that encompass both theoretical frameworks and practical case studies related to AI's role in educational contexts. Furthermore, analysis of reports published by educational institutions, non-governmental organisations (NGOs), and governmental bodies provided important insights into current trends and the potentials of AI integration in Nigerian language learning environments.

In addition, technology and education blogs from reputable sources were reviewed, supplying perspectives from educators, technology experts, and thought leaders who specialise in AI applications in learning contexts. Such sources offer innovative teaching strategies and tools that enrich the understanding of AI's potential in language education. The investigation also incorporated specific case studies that illustrate the implementation of AI in language learning settings, particularly within Nigeria or comparable contexts. These case studies provided empirical evidence demonstrating the impact of AI technologies on language acquisition and pedagogical strategies. The analysis of the collected data was conducted through qualitative content analysis, a systematic approach designed to distil thematic insights from the literature. Initial thematic coding was employed to categorise the information according to various themes related to AI applications in language learning. Prominent themes identified included the types of AI tools available, their potential benefits and challenges, the evolving roles of educators, and the implications for student engagement and learning outcomes (Alenezi, 2023). To further enrich the analysis, a comparative approach was utilised to juxtapose findings across multiple sources, allowing for the identification of consensus and discrepancies present in the literature regarding the efficacy and challenges associated with implementing AI in language instruction.

Synthesis of insights was then undertaken to correlate the identified themes with the current landscape of language learning in Nigeria. This involved a critical examination of how AI

applications could address specific challenges prevalent in the Nigerian educational system, such as limited access to quality resources and the diverse needs of learners. Incorporating AI-driven technological solutions into classrooms can significantly improve Nigeria's overcrowded educational landscape, providing the ideal learning environment tailored to individual student needs (Bali, Garba, Ahmadu, 2024). Despite the advantages associated with using secondary data—such as cost-effectiveness and ease of access—this research acknowledges certain limitations. The dependence on existing literature inevitably constrains the study to the availability and scope of the data at hand. Furthermore, the findings may reflect biases inherent in the original studies, and there may be a scarcity of localised data specifically pertaining to Nigeria. To counteract these limitations, efforts were made to utilise a broad and diverse array of sources in order to achieve a more balanced perspective. Ethical considerations in this research primarily revolved around ensuring proper citation and acknowledgment of original sources to avoid plagiarism. Transparency was upheld throughout the methodology, ensuring that all findings were presented in a manner that accurately represents the interpretations and conclusions of the original authors.

FINDINGS AND DISCUSSION OF THEMES

The assessment of the integration of Artificial Intelligence (AI) into language pedagogy showed several central themes that emerge from analysis of the literature. These themes align with the theoretical frameworks established - Constructivism, Connectivism, and the Technological Pedagogical Content Knowledge (TPACK) framework - drawing from insights provided by the cited authors and sources. The following five major themes summarise the findings:

- **Personalised and Adaptive Learning:** AI enables personalised learning experiences that cater to individual learners' needs and paces, resonating with the constructivist approach highlighted by Piaget (1972) and Vygotsky (1978). AI systems that utilise machine learning algorithms can analyse student performance and provide customised content, thus facilitating adaptive learning environments. This ensures that learners receive tailored support in areas they struggle with, providing deeper understanding and competency. Authors like Gee (2003) and Kapp (2012) emphasise the role of AI in promoting individualised learning strategies that align with students' abilities and preferences, thereby leading to enhanced engagement.
- **Accessibility and Scalability:** Accessibility is an important issue in Nigeria's educational landscape, particularly in remote areas where resources are scarce. AI applications have the potential to democratise language education by making learning resources available to a broader audience. This aligns with Connectivism (Siemens, 2005), which values the interconnectedness of learning within digital networks. The review highlights how AI-powered platforms can break geographical barriers, allowing students from various locations to access quality instruction. The scalability of these technologies can significantly contribute to improving literacy rates and communication skills across different demographics (Oduor, 2017).
- **Real-Time Feedback and Autonomous Learning:** AI tools facilitate immediate feedback, which is crucial for language learners to understand their strengths and weaknesses. This concept is supported by the TPACK framework, emphasising the synergy between technology, pedagogy, and content knowledge (Mishra & Koehler, 2006). Applications equipped with natural language processing can provide instant corrections for pronunciation, grammar, and vocabulary use. This iterative process encourages self-directed learning, allowing students to practice autonomously and develop greater proficiency. This theme echoes the sentiments of Godwin-Jones

(2018) and Desai (2022), underscoring the need for engaging and responsive learning tools that empower learners.

- **Interactive and Contextualised Learning Environments:** AI technologies can create immersive learning experiences that contextualise language use in real-life scenarios. This is particularly relevant in Nigeria's diverse linguistic landscape, where learners can benefit from simulations that involve cultural interactions. Drawing from the principles of Connectivism, the integration of virtual reality (VR) and gamification allows for experiential learning that captivates students' attention, as discussed by Gee (2003) and Kapp (2012). This interactive pedagogy can enhance motivation and retention, making the learning process more enjoyable and effective—a sentiment echoed across the literature.
- **Need for Ethical Frameworks and Educator Preparedness:** While the benefits of AI in language learning are manifold, the literature also underscores the need for ethical considerations and educator training. As highlighted by Desai (2022), concerns regarding data privacy, algorithmic bias, and inclusivity must be addressed to ensure responsible AI use in educational contexts. Furthermore, educators must possess the TPACK necessary to effectively integrate AI tools into their pedagogy (Archambault & Crippen, 2009). Educators need training not only in technological skills but also in understanding the ethical implications of AI, thereby nurturing an environment of trust and safety in language education. The findings illustrate that AI has considerable potential to enhance language learning in Nigeria through personalised, accessible, and interactive pedagogical solutions. However, leveraging this potential requires a concerted effort to address ethical challenges and ensure that educators are prepared to integrate AI thoughtfully into their teaching practices. The theoretical frameworks of Constructivism, Connectivism, and TPACK provide a robust foundation for understanding these developments, guiding the responsible and effective implementation of AI technologies in language education.

LANGUAGE LEARNING AND ARTIFICIAL INTELLIGENCE IN MODERN PEDAGOGY IN NIGERIA

The incorporation of Artificial Intelligence (AI) into contemporary language education presents a significant opportunity to tackle the distinct linguistic challenges encountered in Nigeria, a nation marked by its rich tapestry of over 500 languages, alongside problems such as overcrowded classrooms and scarce resources (Likuru & Mwila, 2022). Traditional teaching methods frequently struggle to accommodate the diverse linguistic backgrounds of students, highlighting the need for innovative strategies to improve language acquisition and instruction across different proficiency levels (Smith & Smith, 2021).

AI technologies can modernize language pedagogy in Nigeria through personalised learning platforms that adapt to individual student needs and which allows for tailored educational experiences essential in a context of significant linguistic variability. Such personalisation is particularly important in accommodating the diverse proficiency levels present among learners (Smith & Smith, 2021). Furthermore, AI enhances access to education, particularly for students in rural or underserved areas in Nigeria, by democratising learning through mobile and web-based applications. However, issues like limited internet access and technology affordability must be addressed to mitigate the urban-rural divide in Nigeria to ensure equitable access to technology-enhanced learning opportunities (Adenubi, Samuel, & Oyenuga, 2025; Nwonye, Nkan, Akpan, 2025).

The capabilities of AI extend to the provision of immediate feedback in language learning contexts, enabling real-time assessment of speaking, writing, and comprehension

skills through applications that utilize voice recognition (Chen et al., 2025). Such advances can enable learners in Nigeria to practice independently and address weaknesses promptly, thereby improving learning outcomes. Additionally, immersive technologies such as augmented reality (AR) and virtual reality (VR) can simulate real-life scenarios, providing learner engagement and confidence in practical language usage (Johnson, Johnson, & Smith, 2014). Related to this, is the employment of data analytics in this new media education which allows teachers to monitor student progress and performance, facilitating adaptive instructional strategies that cater to specific learner needs (Haryanto et al., 2024). This data-driven approach will not only empower students in Nigeria to learn autonomously but also support their teachers in professional development by providing instructional resources and performance feedback.

Despite the promise of AI, challenges persist, including technology access disparities and concerns regarding digital literacy among educators and students in Nigeria. Ethical considerations surrounding data privacy and the need for cultural inclusivity in AI systems are paramount to ensure these technologies reflect the linguistic diversity of Nigeria (Van Norren, 2023; Adebara, 2024). The risks of algorithmic bias necessitate careful consideration, particularly given the influence of societal biases captured in language. Although AI in language education holds immense potential to enhance language learning in Nigeria by providing personalised, accessible, and engaging learning environments, collaborative efforts among educators, policymakers, technology developers, and communities will be key to fully realize these capabilities, in promoting educational advancement and socio-economic development in the country.

CONCLUSION AND RECOMMENDATIONS

In conclusion, the integration of Artificial Intelligence (AI) into language pedagogy presents a transformative opportunity for enhancing language learning in Nigeria. The findings outlined in the analysis indicate that AI offers tailored, accessible, and interactive educational solutions that are well-suited to address the unique challenges posed by Nigeria's diverse linguistic landscape. AI tools significantly improves language acquisition and teaching methodologies across the country as it facilitates personalised learning experiences, enabling real-time feedback, and creating immersive educational environments. However, realising the full potential of AI in language education necessitates careful consideration of ethical implications and the preparation of educators. As highlighted in the themes of this analysis, the successful implementation of AI technologies hinges on addressing issues related to data privacy, algorithmic bias, and the need for inclusivity. Also, equipping educators with the necessary skills and knowledge to effectively integrate AI into their teaching practices is critical to maximising the technology's impact on student learning.

RECOMMENDATIONS

- Investment in Infrastructure: Stakeholders, including the Nigerian government and educational institutions, should prioritise investments in technological infrastructure, particularly in remote and underserved areas. Enhancing connectivity and access to digital resources will enable broader adoption of AI-driven language learning tools.
- Teacher Training and Professional Development: Comprehensive training programs should be developed for educators to deepen their understanding of AI technologies, focusing on both technological proficiency and pedagogical adaptation. Workshops and continuous professional development initiatives can help teachers learn to integrate AI tools effectively while addressing ethical considerations.

- Ethical Guidelines and Frameworks: Education policymakers and technology developers must collaborate to establish ethical guidelines that govern the use of AI in educational contexts. These guidelines should address issues such as data privacy, inclusivity, and algorithmic fairness to ensure that AI-driven solutions do not perpetuate biases or exclude marginalised groups.
- Promoting Collaborations and Partnerships: Encouraging partnerships between educational institutions, technology companies, and NGOs can nurture the development of innovative AI-driven language learning solutions. Collaborative projects can leverage expertise and resources to create culturally responsive and contextually relevant educational tools.
- On-going Research and Evaluation: Continuous research should be conducted to evaluate the effectiveness of AI applications in language learning within the Nigerian context. This research can inform best practices and provide insights into the evolving needs of learners and educators, ensuring that AI tools remain relevant and effective. Nigeria has the opportunity to harness the power of Artificial Intelligence to create an enriching and effective language learning environment if these recommendations are embraced. This holistic approach will not only enhance language proficiency but also contribute to the total educational advancement and social cohesion in a nation characterised by its linguistic diversity. The thoughtful and responsible integration of AI into language pedagogy will illuminate further, the way for a more literate, communicative, and interconnected society.

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