

ARTIFICIAL INTELLIGENCE, TERTIARY EDUCATION AND NATIONAL DEVELOPMENT.

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Abstract

Artificial Intelligence (AI), clearly but arguably, has emerged as a transformative force across various sectors of national economies, with education being one of the most affected. In tertiary education, AI technologies are reshaping teaching, learning, research, and institutional management. This paper examines the role of AI in tertiary education and its contribution to national development in Nigeria. Drawing on relevant literature, the paper discusses conceptual perspectives of AI, its applications in Nigeria tertiary institutions, and the link between AI-driven education and national development. It further highlights challenges limiting effective AI adoption and proposes strategies for leveraging AI to achieve sustainable national development. The paper concludes that while AI offers significant opportunities for improving educational quality and national productivity, deliberate policy frameworks, infrastructure development, and capacity building are essential for its successful integration in Nigeria's tertiary education system.

Keywords: Artificial Intelligence, Tertiary Education, National Development

Introduction

Artificial intelligence is not a futuristic concept, it is here and now, already infiltrating into majority if not all aspects of human endeavours with the speed of light. This, the rapid advancement of Artificial Intelligence (AI) has significantly altered the way societies function, learn, and innovate. AI refers to the ability of machines and computer systems to perform tasks that typically require human intelligence, such as learning, reasoning, problem-solving, and decision-making (Russell & Norvig, [2021](#)). Globally, tertiary education institutions are increasingly adopting AI-driven tools to enhance teaching effectiveness, research productivity, and administrative efficiency.

In Nigeria, tertiary education plays a critical role in national development by producing skilled manpower, promoting innovation, and supporting socio-economic growth (Okebukola, [2019](#)).

However, challenges such as inadequate funding, overcrowding, outdated curricula, and weak research capacity have limited the sector's effectiveness. The integration of AI into tertiary education is therefore perceived as a strategic pathway to improving educational outcomes and driving national development. Hence, this paper explores the intersection of AI, tertiary education, and national development in Nigeria.

Conceptual Clarification

Artificial Intelligence

Artificial Intelligence is defined as the study and development of computer systems capable of performing tasks that normally require human intelligence (McCarthy, 2007). According to Russell and Norvig (2021), AI systems can be categorized into narrow AI, which performs specific tasks, and general AI, which aims to replicate human cognitive abilities. In education, AI is largely applied through adaptive learning systems, intelligent tutoring systems, learning analytics, and automated administrative tools. Artificial intelligence (AI) enables machines to mimic human cognition, like learning, problem-solving, and decision-making. There are narrow AI (specialized tasks, e.g., Siri, image recognition) and general AI (human-like intelligence, still theoretical). AI transforms industries: healthcare, education, finance, entertainment, as well as transportation. Benefits of artificial intelligence (AI) include enhanced efficiency, innovation, and insights from data analysis. The future of AI holds promise, but human oversight and values must guide its development to maximize benefits and minimize harm, shaping a future where AI augments human capabilities.

Tertiary Education

Tertiary education refers to post-secondary education offered by universities, polytechnics, colleges of education, and other higher institutions. As noted by Aina (2018), tertiary education is responsible for advanced knowledge creation, professional training, and research development, all of which are vital for national progress. Tertiary education refers to post-secondary education, typically universities polytechnics and colleges, focusing on specialized knowledge and skills. It enhances career prospects, critical thinking, and personal growth. Benefits include increased earning potential, networking opportunities, and access to resources. Challenges involve financial costs, accessibility, and adapting to evolving job markets. Graduates often pursue careers in fields like education, healthcare, and business. Tertiary education no doubt, is key to national development, driving innovation and economic growth.

National Development

National development encompasses improvements in the economic, social, political, and technological well-being of a nation. Todaro and Smith (2020) describe national development as a process that enhances human capital, reduces poverty, increases productivity, and improves the quality of life of citizens. Education, particularly tertiary education, is widely regarded as a cornerstone of sustainable national development. National development involves improving a country's economic, social, and political well-being. Key areas include infrastructure, education, healthcare, and technology. Benefits include poverty reduction, increased living standards, and global competitiveness. Challenges involve corruption, inequality, and resource management. In Nigeria specifically, initiatives like the National Development Plan focus on diversifying the economy and boosting human capital. Clearly, progress requires collaboration between government, private sector, and citizens.

Applications of AI in Tertiary Education in Nigeria

Teaching and Learning

AI has introduced new possibilities for teaching and learning in Nigerian tertiary institutions. Adaptive learning platforms personalize instruction by analyzing students' learning patterns and adjusting content to suit individual needs (Holmes et al., 2019). According to Adebayo and Adigun

(2021), AI-powered tools such as intelligent tutoring systems and chatbots can provide instant feedback, academic support, and continuous assessment, thereby improving student engagement and academic performance. Also, AI transforms teaching and learning by personalizing education, automating grading, and enhancing student engagement. Adaptive learning platforms tailor content to individual needs, while AI-powered tools provide real-time feedback. This allows educators to focus on complex tasks, improving learning outcomes and efficiency.

Research and Knowledge Production

Research is a core function of tertiary education. AI tools assist researchers in data analysis, literature review, plagiarism detection, and predictive modeling. Okonkwo and Eze (2022) argue that AI enhances research efficiency and enables Nigerian scholars to participate more actively in global knowledge production. This strengthens innovation capacity and contributes to national technological advancement. AI revolutionizes research and knowledge production by analyzing vast datasets, identifying patterns, and generating insights. Tools like language models aid literature reviews, data analysis, and hypothesis generation. This accelerates discovery, enhances collaboration, and expands human understanding, enabling researchers to tackle complex problems more efficiently.

Administration and Institutional Management

AI is increasingly used to automate administrative tasks such as student admission processing, record management, examination grading, and timetable scheduling. According to Salami (2020), AI-driven management systems reduce bureaucratic delays, minimize human errors, and promote transparency and accountability in tertiary institutions. Again, AI streamlines administration and institutional management by automating tasks, optimizing resource allocation, and enhancing decision-making. Applications include admissions, finance, and facilities management. AI-powered tools improve efficiency, reduce errors, and free up staff to focus on strategic initiatives, boosting institutional effectiveness and productivity.

AI, Tertiary Education, and National Development

Human Capital Development

Human capital development is central to national development. By integrating AI into tertiary education, students acquire digital, analytical, and problem-solving skills required in the modern labor market. Nwankwo (2021) emphasizes that AI literacy enhances graduates' employability and prepares them for participation in the knowledge-based economy.

Furthermore, AI drives human capital development by enhancing skills, personalizing learning, and predicting workforce needs. Adaptive training platforms upskill employees, while AI-powered tools optimize talent acquisition and performance management. This boosts productivity, innovation, and career growth, preparing individuals for evolving job markets and enabling organizations to thrive.

Economic Growth and Innovation

AI-driven tertiary education supports economic growth by fostering innovation, entrepreneurship, and industrial development. Graduates trained in AI-related fields contribute to sectors such as finance, healthcare, agriculture, and manufacturing (World Bank, 2020). This aligns with Nigeria's aspiration for economic diversification and reduced dependence on oil revenues. Arguably, AI fuels economic growth and innovation by boosting productivity, creating new industries, and driving entrepreneurship. Applications include predictive analytics, automation, and personalized services. AI-powered solutions enhance competitiveness, attract investments, and improve resource allocation, contributing to sustainable economic development and improved living standards.

Global Competitiveness

The adoption of AI in higher education enhances Nigeria's global competitiveness.

Universities that leverage AI for research and innovation are better positioned to collaborate internationally and attract funding and partnerships (UNESCO, [2021](#)). Such global engagement strengthens national development outcomes. As expected, AI enhances global competitiveness by driving innovation, efficiency, and productivity. Nations and businesses leveraging AI gain advantages in tech, manufacturing, and services. AI-powered solutions optimize processes, predict trends, and create new opportunities, positioning adopters as leaders in the global economy and fostering sustainable growth.

Challenges of AI Adoption in Nigerian Tertiary Education

Despite its benefits, several challenges hinder the effective use of AI in Nigerian tertiary institutions. First, inadequate infrastructure such as unreliable electricity supply and limited internet connectivity restrict AI deployment (Adebayo & Adigun, [2021](#)). Second, there is a shortage of skilled personnel capable of developing and managing AI systems (Okonkwo & Eze, [2022](#)). Third, high costs of AI technologies and insufficient funding pose serious constraints. Finally, ethical concerns related to data privacy, academic integrity, and misuse of AI tools remain largely unregulated (Holmes et al., [2019](#)).

Strategies for Enhancing AI Use for National Development

To maximize the benefits of AI in tertiary education, several strategies are recommended. Government should invest in digital infrastructure and provide sustainable funding for AI initiatives in higher institutions. Government investment in digital infrastructure will boost connectivity, e-governance, and economic growth. It enables widespread internet access, digital services, and innovation, thereby positioning Nigeria as a tech hub and improving citizen engagement. According to Okebukola ([2019](#)), curriculum reform is necessary to integrate AI and digital competencies across disciplines.

Also, continuous professional development programs should also be organized to train lecturers and administrators in AI applications. Continuous professional development programs incorporating AI enhance skills, boost productivity, and foster innovation. AI-powered learning platforms personalize training, predict industry trends, and provide real-time feedback, enabling professionals to stay competitive and adapt to evolving job markets. Furthermore, clear national and institutional policies should be developed to regulate ethical AI use in education. This is right because clear national and institutional policies provide direction, ensure accountability, and foster an environment conducive to growth and national development.

Conclusion

Artificial Intelligence has the potential to transform tertiary education and accelerate national development in Nigeria. Through improved teaching and learning, enhanced research capacity, efficient administration, and strengthened human capital development, AI can serve as a catalyst for socio-economic transformation by driving socio-economic transformation and boosting productivity, enhancing governance, as well as fostering innovation, improving living standards and economic growth.

However, realizing this potential requires addressing infrastructural, financial, human capacity, and ethical challenges. With deliberate planning, policy support, and investment, AI can significantly contribute to the advancement of tertiary education and sustainable national development in Nigeria. In other words, AI can drive sustainable national development in Nigeria by enhancing resource management, improving infrastructure, and fostering innovation, leading to economic growth and improved living standards of her citizens.

Suggestions

To revolutionize Tertiary education and improve national development, the following should be embraced;

1. Integrate AI literacy into school curricula to equip students with future skills.
2. Establish AI-focused research centers to drive innovation and solutions.
3. Foster industry-academia partnerships for AI project development.

4. Develop policies supporting AI adoption in education and entrepreneurship
5. Address equity and access: Ensure that all students have access to AI-powered tools, innovative and creative opportunities.

By following these suggestions and embracing the intersection of AI, education, and national development, educational institutions can revolutionize education and create a brighter future for the nation Nigeria.

References

- Adebayo, A. A., & Adigun, J. O. (2021). *Artificial intelligence and the future of higher education in Nigeria*. *Journal of Educational Technology*, 15(2), 45–58.
- Aina, O. I. (2018). *Higher education and national development in Nigeria*. *African Journal of Educational Studies*, 12(1), 1–15.
- Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning*. Boston: Center for Curriculum Redesign.
- McCarthy, J. (2007). *What is artificial intelligence?* Stanford AI Project.
- Nwankwo, I. N. (2021). *Digital skills and employability of Nigerian university graduates*. *Nigerian Journal of Educational Research*, 24(3), 89–102.
- Okebukola, P. A. (2019). *Tertiary education, research and innovation for national development in Nigeria*. *Higher Education Review*, 11(2), 23–39.
- Okonkwo, E. C., & Eze, S. C. (2022). *Artificial intelligence and research productivity in Nigerian universities*. *International Journal of Research and Innovation*, 6(1), 66–78.
- Russell, S., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed.). Pearson.
- Salami, I. A. (2020). *Automation and administrative efficiency in Nigerian universities*. *Journal of Educational Management*, 8(1), 14–27.
- Todaro, M. P., & Smith, S. C. (2020). *Economic development* (13th ed.). Pearson.
- UNESCO. (2021). *Artificial intelligence and the future of higher education*. Paris: UNESCO.
- World Bank. (2020). *Nigeria digital economy diagnostic report*. Washington, DC: World Bank.

THE IMPACT AND CHALLENGES OF THE USE OF ARTIFICIAL INTELLIGENCE (AI) IN LANGUAGE EDUCATION FOR NATIONAL DEVELOPMENT

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Abstract

The integration of AI in language education has revolutionized the way languages are taught and learned, offering unprecedented opportunities for personalized learning, enhanced accessibility and improved outcomes. This paper explores the impact of AI on language education and its implications for national development. It examines the benefits of AI-powered language learning tools, such as adaptive learning systems, intelligent tutoring systems and language assessment platforms. The paper also discusses the challenges associated with AI in language education, including issues of equity, bias and the need for teacher training. Furthermore, it highlights the potentials of AI to drive national development by enhancing language skills, promoting cultural understanding and fostering global communication. The paper concludes by emphasizing the need for stakeholders to harness the potentials of AI in language education while addressing its challenges to ensure inclusive and effective language learning for all.

Keywords: Artificial Intelligence, Language Education, National Development, Personalized Learning, Intelligent Tutoring Systems.

Introduction

Language learning has become increasingly important in the age of Artificial Intelligence (AI). As AI technology advances, it becomes more capable of understanding and communicating in different languages. This makes language proficiency an essential skill for individuals seeking to work with or alongside artificial intelligence systems. Language is a conduit for transmission of the people's culture, norms, ideas and belief. The repository of a people's identity and way of life is encapsulated in their language as well as transferred to other people and newer generations through the means of language. This therefore, posits that a lost language is a lost identity as well as lost race and people. It is a key that is capable of bringing about the development of a people. The development can come in form of economic, political, educational, technological and social development. All of these developments are initiated, executed, conveyed and archived by means of language (Nwobia, 2015). Language is the key to the heart of the people and if we lose the key, we lose the people. If we treasure the key and keep it safe, it will unlock the door to wealth (Nwadike, 2004).

Natural language has many unique properties; amongst which is that it plays dual role in most known formal educational systems. It features, on the one hand, as a subject on the school curriculum and accordingly permits one to talk of language education in much the same way that one would talk of Physics Education, Science Education, Economics Education. On the other hand, and completely unlike any of the other subjects on the curriculum, it also serves all over the world as the medium of instruction in all the subjects, including itself (Awobuluyi, 1998).

Artificial Intelligence (AI) in language learning is revolutionizing the approach to language acquisition, as it's capable of processing vast amounts of data, making it an essential tool for both learners and educators. Whether it is through chatbots; that stimulate real-life conversations, personalized lesson plans based on individual learner needs or advanced speech recognition technology that can identify nuanced pronunciation errors, AI is making language learning more accessible and effective than ever before (Campbell, 2023).

Concept of Artificial Intelligence (AI)

Artificial Intelligence (AI) refers to the capability of computer systems or machines to perform tasks that typically require human intelligence or reasoning. Artificial Intelligence (AI) is the computer-controlled robots that think intelligently like human. These robots are controlled electronically with the aid of the computer by mimicking the competencies of the human mind. AI keeps records and analysis of every action being made by the user. AI has become a part of our normal lives as we are surrounded by this technology from automatic parking systems' smart sensors for taking spectacular photos and personal assistance.

AI has the power to go as far as spatial processing, language processing and even image processing. It is defined as intelligence exhibited by machines and has many applications in today's society. AI is a program developed to perform specific tasks that are being utilized for a wide range of activities including medical diagnosis, electronic trading platforms, robot control and remote sensing.

AI is both a driving force of the fourth educational revolution and a major carrier of the technological progress that is changing societies and economies globally (Eleyyan, 2021). AI in global education has sparked diverse perspectives on its capacity to enhance learning streamline administration and inform data driven decisions. In Nigeria, AI's promise intersects with a historically challenged educational system, characterised by large class sizes, infrastructural deficits and pronounced urban-rural divides (Ukala & Ukala, 2024).

Artificial Intelligence (AI) plays a vital role in transforming the learning experience. It assists learners to work at their own pace, engages them with activities and appeals to their interests. Several language learning mobile applications use the potential advantages of AI in education in helping users learn a new language by investing a small amount of time daily with the help of AI. Examples of such apps include: Duolingo, Mondly and Babble. Generally, AI is reshaping everything thinkable, including the global economy and education resources. The academic world is becoming more convenient and personalized, thanks to the numerous applications of AI for education. This has changed the way people learn since educational materials are becoming accessible to all through smart devices and computers. Today, students do not necessarily need to attend physical classes to study, as long as they have computers and internet connection of administrative tasks, allowing institutions to minimise the time required to complete difficult tasks so that the educators can spend more time with students (Makanjuola-Agbola & Idakwoji, 2023).

The automated grading of assignments, scheduling classes, managing student's records and even communicating with parents were becoming increasingly common with the help of AI. This allows teachers to dedicate more energy to what they do best; fostering meaningful interactions with students, providing mentorship and designing engaging lessons. Tools like Grammarly and Turnitin for instance are already assisting with proofreading and plagiarism detection, lightening the load on instructors.

Language Education

Although the need to learn foreign languages is almost as old as human history itself, the origins of modern language education are in the study and teaching of Latin in the 17th century. In the Ancient Near East, Akkadian was the language of diplomacy, as in the Amarna letters. For many centuries, Latin had been the dominant language of education, commerce, religion and government in much of the Western world. By the end of the 16th Century, it had largely been displaced by French, Italian and English (https://en.wikipedia.org/wiki/language_education).

Language education refers to the processes and practices of teaching a second or foreign

language. Its study reflects interdisciplinary approaches, usually including some applied linguistics. There are four main learning categories for language education: communicative competencies, proficiencies, cross-cultural experiences and multiple literacies. Increasing globalization has created a great need for people in the workforce who can communicate in multiple languages. Common languages are used such as trade, tourism, diplomacy, technology, media, translation, interpretation and science. Many countries frame education policies to teach at least one foreign language at the primary and secondary school levels.

However, anecdotal evidence for successful second or foreign language learning is easy to find, leading to a discrepancy between these cases and the failure of many language education programs. This tends to make the research of second language acquisition emotionally charged. Older methods and approaches such as the grammar translation method and the direct method may be dismissed and even ridiculed, as newer methods and approaches are invented and promoted as solutions to the problem of the high failure rates of foreign language students. Some books on language teaching describe various methods that have been used in the past and end with the author's new method. These methods may reflect the author's views and such presentations may de-emphasize relations between old and new methods. For example, descriptive linguists seem to claim that there were no scientifically-based language teaching methods before their work (which led to the audio-lingual method developed for the USA Army in World War II).

There have been two major branches in the field of language learning: the empirical and the theoretical. These have critically separate histories with each gaining prominence at one time or another. The rivalry between the two camps is intense, with little communication or cooperation between them. Examples of scholars on the empiricist side include: Jespersen, Palmer and Leonard Bloomfield who promoted mimicry and memorization with pattern drills. These methods follow from the basic empiricist position that language acquisition results from habits formed by conditioning and repetition. In its most extreme form, language learning is seen as like any learning in any species, human language being essentially the same as communication behaviours seen in other species. Examples of scholars on the theoretical side include Francois Gouin, M.D. Berlitz and Emile B. De Saussure, whose rationalist theories of language acquisition dovetail with linguistic work done by Noam Chomsky and others.

Language education examines how languages are learned and about the pedagogical methodologies for language acquisition. This means that it is the acquisition of language using certain methodologies. Man studies language for two reasons; partly in order to understand language and how it works and partly in order to understand what people do with it. Language education therefore, helps us to inculcate in us both the skills and functions of language so that when these skills are used in linguistic activities, they may correspond to the proper functions of language in human society; proper language education aims at bringing a participant to a stage whereby when he listens, he knows what to expect from the speaker and when he speaks, he should be able to determine or predict the reaction of his listener.

National Development

National development can be described as the overall development of a collective socio-economic, political as well as religious advancement of a country or nation. This is best achieved through development planning, which can be described as the country's collection of strategies mapped out by the government (Lawal and Oluwatoyin, 2011). National development is a process of reconstruction and development in various dimensions of a nation and development of individuals. It is holistic in approach. It can be best defined as the all-round and balanced development of different aspects and facets of the nation viz political, economical, social, cultural, scientific and material.

The ability of a country to improve the standard of living of the citizens is referred to as national development. It may be accomplished through meeting the people's fundamental requirements for sustenance and employment, among other things. Growth, progress, and good

change are all part of the development process. Development is an indication of good health. National development components are:

- The growth of rural regions
- Increased agricultural production
- Economic understanding is being expanded
- Urban regions growth
- Poverty eradication

The government of respective countries are constantly striving to achieve national development by controlling or eliminating various challenges. Development is the process of bringing about positive change by bringing about growth in a particular sector, development has two dimensions namely: economic growth which brings improvement in the income of the people and social progress which improves the services of the people. National development is a broader concept than development. In essence, national development is the ability of a country to improve the quality of its citizens. National development is when a country strives for the personal all-round progress of its citizens in the broad sense of shaping the country's various fronts (<https://www.doi.org.10.3354/2706891.2025v7b.1582>)

The Impact of Artificial Intelligence (AI) on Language Education

One of the biggest advantages of AI in language learning is its ability to provide instant feedback. Traditional classroom settings often rely on periodic assessments to measure progress and provide feedback, but with AI-powered tools, learners can receive immediate corrections and suggestions for improvement. This not only speeds up the learning process but also makes it more engaging by providing a sense of accomplishment as learners see their skills improve in real time. However, while AI offers many benefits for language learners, there are also concerns about its impact on human interaction and socialization skills.

As we increasingly rely on machines for communication and feedback, some worry that we may lose important face-to-face interactions that are crucial for developing certain aspects of communication, such as empathy and nuance. Nonetheless, with careful implementation and consideration given to both the benefits and drawbacks of this technology in educational settings, AI has the potential to revolutionize how we learn languages (Campbell, 2023). The importance of human interaction in learning a new language cannot be overstated, despite the fact that AI can clearly improve language learning experiences in many ways.

AI-powered translation tools have revolutionized the way we communicate across language barriers. These tools leverage complex algorithms and machine-learning techniques to provide near – human translations of text or speech. However, their accuracy can vary depending on several factors such as the quality of the data used for training, the complexity of the source language and context-specific nuances. Despite significant improvements in AI-powered translation tools in recent years, they are still not perfect. For instance, idiomatic expressions that do not have a direct equivalent in another language can be challenging to translate accurately. Similarly, cultural references or local dialects can be difficult to capture using these tools. Thus, while AI-powered translation tools offer tremendous value by enabling communication across languages quickly and effectively, users should exercise caution when relying on them for critical communication.

Regardless of their limitations, AI-powered translation tools remain an essential aid for language learners worldwide. They offer an efficient way to learn new words and phrases while practicing grammar structures in context. Language learners can also use these tools to improve their pronunciation skills by listening to the translated output and comparing it with native speakers' pronunciation. Overall, AI-powered translation tools offer immense potential for improving language learning outcomes if used appropriately and complementarily with other resources such as human instructors or authentic materials like books or videos from native speakers' environments (Campbell, 2023).

The advent of AI introduces a paradigm shift presenting opportunities to revolutionize the way children engage and master language skills. This shift is driven by the potential of AI to provide personalized and adaptive learning experiences, addressing the unique needs and learning styles of each child. “Artificial Intelligence” (AI) is often used to refer to the learning and intelligence shown by machines or computers. Learning, prediction and sensing are all mental processes that have been analogized with the help of AI. Personalized learning environment, an AI-powered automation of the teaching, learning and grading processes are gaining traction in the academic world. In the rapidly evolving landscape of education, the integration of AI has emerged as a transformative force, promising groundbreaking advancements in various domains (Benebo-Solomon & Ohaka, 2024).

However, most schools' approaches to education have been updated and improved, AI technology has revolutionized the education sector generally. Innovative learning and more successful completion of learning objectives are being facilitated through AI-powered interactive systems.

Benefits of AI-Powered Language Tools

a. Personalized Learning Experience

In recent years, AI-powered language tools have gained significant attention due to their potentials to revolutionized language teaching and learning. The integration of AI in English Language Teaching (ELT) presents a promising yet complex area, containing both advantages and challenges. The benefits encompass a wide range of advantages, including personalized learning experience, adaptive curriculum and enhanced engagement via interactive AI applications. AI-powered tools offer personalized content delivery, adapting to individual learning styles and pacing and thereby fostering more efficient and effective learning outcomes. Moreover, these tools often incorporate Natural Language Processing (NLP) algorithms, enabling immersive language practice, automated feedback and real time assessment, which significantly improve the learning process (Dugosija, 2024).

AI-powered systems can analyze learner's data to create customized content, provide targeted feedback and adapt to each student's pace. Application of AI in education include intelligent tutoring systems, automated grading and immersive virtual reality environments. These technologies have the potential to improve student's engagement, learning outcomes and educational efficiency.

b. Vocabulary Expansion

AI tools in language can introduce new vocabulary to learners through interactive activities, games and contextual usage which are prerequisites in Early Childhood Education (ECE). Though the presentations of words in an engaging and meaningful manner, the AI tools would help the children grasp and understand their meanings and usage effectively.

c. Language Modelling

AI tools also serve as language models in ECE, by demonstrating proper grammar, sentence structure and language conventions. Through interactions with AI-powered systems, learners are exposed to correct linguistic patterns and they can improve their language skills by imitating and practicing the language models provided. AI tools also offer suggestions and corrections to students' written language, helping them to refine their written communication skills.

d. Support to Learners with language barriers

AI tools can support learners with language difficulties or language barriers, providing additional assistance and resources. These tools therefore offer a safe and non-judgmental environment for the learners to practice and improve their language skills, encouraging full

participation and reducing the risks of anxiety. AI-powered language learning tools can also provide support for children who want to learn a second language, facilitating their language acquisition and fluency (Benebo-Solomon & Ohaka, 2024).

Challenges associated with AI in Language education

The following are challenges associated with the use of AI in language education:

i. The Complexities of human language

One of the main challenges of AI in language learning is its inability to fully understand the nuances and complexities of human language. While AI systems can recognize and analyze individual words and phrases, they may struggle with understanding idiomatic expressions or sarcasm. As a result, relying solely on AI for language learning may lead to students missing important cultural contexts or making embarrassing communication errors.

Another limitation of AI in language learning is its ability to personalize instruction. While some AI programs can adapt their lessons based on students' performance, they cannot entirely replicate the level of personalization that comes from working with a human tutor or teacher. It is worth noting that not all learners have access to the technology required for the successful use of AI in language learning. Without reliable internet access or necessary hardware (such as smartphones or computers) students may find themselves unable to take advantage of these tools.

ii. Lack of human interaction

The absence of interpersonal interaction is one of the negatives. While AI can give students access to a variety of knowledge and resources, it cannot take the place of the advantages of speaking with a human teacher or conversation partner. Human interaction allows for more personalized and adaptive learning experiences. A teacher can tailor his lesson to match a student's learning style and pace while also providing immediate feedback on pronunciation and grammar. In addition, conversing with native speakers allows learners to practice real life communication skills and pick up on cultural nuances that may not be captured by an AI program.

iii. The Problem of Access and Equity

In Nigeria and other developing countries, access and equity pose a great hurdle in the effective and efficient use of AI tools due to disparities in technological access, resource availability, lack of reliable internet connections and the cost of technology infrastructure can widen the educational gap. Children in rural areas lack reliable internet connections, experience epileptic electricity or face challenges in acquiring the necessary technology. Ensuring comprehensive support and training for educators and parents in under-resourced communities is crucial to bridging access and equity gaps.

iv. Child Safety, Data Privacy and Security

The problem of child safety, data privacy and security must be addressed. All the AI systems designed to detect and respond to potential safety issues and inappropriate behaviour which is essential for creating a secure learning environment be put in place. In order to ensure trust among teachers, parents and learners; hence the need to checkmate privacy policies, robust data security systems, encryption technique and transparent communication about the usage of data.

Conclusion

AI has the potential to transform education sector and revolutionize how we interact with technology. AI can improve the accuracy and speed of tasks, reducing the risk of human errors. The application of AI in teaching and learning has come to stay, Nigerian government will likely leverage AI to achieve its educational goals, including enhanced knowledge acquisition in classroom setting and at home.

It is pertinent that AI offers significant benefits to education. These positive impacts are accompanied by considerable challenges for teachers, learners and stakeholders. In order to address these challenges, there must be provision for teacher training and teaching technology support to

assist students with the means to learn effectively using AI technology. Providing proper training and professional development opportunities to teachers is imperative in order to equip teachers with the skills and knowledge required to integrate AI into their teaching practices. Continuous professional development opportunities should be established to keep teachers up-to-date with the latest advancements in AI.

Recommendations

- i. There should be collaboration with educational stakeholders to integrate AI-related subjects and skills into the national curriculum. This integration must be accompanied by the development of relevant learning resources and teaching materials.
- ii. In formulating policies, government should consider multi-stakeholders involving educators, learners, parents and the private sectors. Such engagement ensures that AI strategies are cultural, appropriate, aligned with national curricular and sustainable in the long term.
- iii. As AI continues to integrate into various sectors, its application in language education is both celebrated and scrutinized. While AI holds significant potential to transform learning experiences, it also presents several disadvantages that need careful consideration that must be addressed to ensure a balanced & effective learning environment. It is crucial to reassure stakeholders that student's data is secure and used exclusively for infrastructural purposes.

References

- Awobuluyi, O. (1998). Language education in Nigeria: Theory, policy and practice. *Fafunwa Foundation Internet Journal of Education*.
- Benebo-Solomon, W., & Ohaka, R.U. (2024). Utilizing intelligence tools for language acquisition in early childhood education. *International Journal of Industrial Leadership, Policy and Management*. 6(4), 543-552.
- Campbell, R. (2023). *Language learning in the age of AI: Challenges and opportunities*. richardcampbell.com
- Dugošija, T. (2024). Benefits and challenges of artificial intelligence in English language teaching. *Knowledge-International Journal* 62(2) 275-280. ojs.ikm.mk
- Eleyyan, S. (2021). The future of education according to the fourth industrial revolution. *Journal of Educational Technology and Online Learning* 4(1), 23-30. doi.org
- Wikipedia. *Language education*. Retrieved February 23, 2026, from en.wikipedia.org
- Lawal, T., & Oluwatoyin, A. (2011). National development in Nigeria: Issues, challenges and prospects. *Journal of Public Administration and Policy Research*, 3(9), 237-241.
- Makanjuola-Agbola, A., & Idakwoji, S. (2023). An analysis of the role of AI in Nigeria's educational system. *African Journal of Theory and Practice of Educational Research (AJTPER)*.
- Nwadike, E. (2004). The role of Igbo in enhancing national unity. In Oyewole (Ed.) *Nigerian languages for national development and unity*. Longman Communication.
- Nwobia, N.U.E. (2015). The place of indigenous Nigerian languages in national development. In research on humanities and social sciences. 5(12), 112-116.
- Ukala, C.C., & Ukala, A.N. (2024). Charting a strategic path: AI in Nigerian education and implications for policy. *International Journal of Scientific Research in Education*, 17(4), 496-504.