



APPLICATION OF ARTIFICIAL INTELLIGENCE IN BUSINESS EDUCATION CURRICULUM FOR NIGERIAN ECONOMIC DEVELOPMENT: OPPORTUNITIES AND CHALLENGES

OLUPAYIMO, E. O., EDEH, T.

Department of Business Education, Adeyemi Federal University of Education, Ondo
estherolupayimo@gmail.com

Abstract

This paper discusses the potential application of Artificial Intelligence (AI) in Business education curriculum to drive Nigeria's economic development. By explaining the intertwining relationship of AI, education, and economic development, this paper identifies opportunities for AI to enhance business education outcomes, develop a skilled workforce and stimulate economic expansion. However, it also highlights significant challenges, including infrastructural gaps, resource constraints, and policy limitations amongst others. The paper adopts an analytic approach to discussing information gathered from existing literature that had hitherto interrogated AI applications. This is to provide actionable insights and recommendations that will address a seamless adaptation of AI to business education curriculum to enhance Nigerian economic development. It is hoped that, leveraging AI will unlock Nigeria's economic potential. Through a trenchant exploration of the complex relationships between AI, Business education, and economic development, this study interrogated evidence-based strategies for Nigeria's sustainable development and technological advancement.

Keywords: artificial intelligence, business education, economic development

Introduction

Nigeria's burgeoning focus on technological innovation and economic diversification creates a fertile ground for adopting Artificial Intelligence (AI) in Business education curriculum. This convergence presents a dual-edged scenario: On one hand, AI offers unprecedented opportunities to cultivate a highly skilled workforce, aligning with the country's economic aspirations (Adeniran, 2023). On the other hand, the integration of AI in Nigerian educational institutions is hindered by significant obstacles, including inadequate infrastructure and insufficient training resources (Okoro & Eze, 2022). To unlock AI's transformative potential and drive Nigeria's economic growth, it is crucial to address these challenges and harness the power of AI in Business education curriculum. Technology advancement has changed the way things are done in our everyday life ranging from business operations, schools, the health sector, engineering, agriculture, religion, legal sector, and security, even the way things are done in the household is not left behind. There is this agitation in the mind of people since the advent of artificial intelligence as an aspect of technological advancement that one day; machines might take over the responsibilities of human beings in any sector of the economy.

In the recent past, financial houses and some other organizations providing essential services were jam-packed with personnel of different categories performing different functions. Recently, technology has taken over with the most recent much-talked-about artificial intelligence



performing the roles of workers with improved services. As observed by the researchers, most things that were flopped in the past through human biases are now being attended to through AI with little or no bias which has continued to reduce system failures occasioned by human complications to be reduced to the barest minimum. Artificial intelligence (AI) is the study of intelligent machines and software that can reason, learn, gather knowledge, communicate, manipulate and perceive objects (Verma, 2018). It was reported that artificial intelligence was coined by John McCarthy in 1956 as a branch of computer science concerned with making computers behave like humans. Indeed, it is evident that AI is now behaving like humans in many areas like casting news, and is effectively used in other areas of entertainment, fighting crimes, teaching and learning, and writing minutes of meetings, among others. Hence, its application in the business education curriculum cannot be an exemption for the programme to attain its lofty goals for economic development in the Nigerian context.

Business education provides education for and about business which prepares youth and adults for employment by providing an experience which enables them to develop competencies needed in the world of work (Olupayimo, 2021). In essence, education for and about business cuts across all disciplines because no discipline does not require the knowledge of business education to succeed in their businesses, hence, the need for teaching and learning process to be adequate and suitable to achieve its objectives.

Economic development can be described as the process of improving the country's economic performance, diversifying its economy, and enhancing the well-being of its citizens. The economy of Nigeria at present is devastating. Nigeria has the largest economy in Africa with a GDP of over \$250 billion. Unfortunately, oil exports dominate the Nigerian economy and account for over 90% of export earnings (IMF, 2024). Moreover, the whole economy has been dollarized making life unbearable for citizens. There is the need, therefore, to integrate artificial intelligence into the teaching and learning of Business education to enable its recipient to use the knowledge, skill, and technical know-how acquired to develop the Nigerian economy. The objectives of this paper, therefore, include exploring how AI technologies can enhance Business education in Nigeria, evaluating the challenges of AI adoption in Nigerian institutions, and assess the potential economic benefits of improved educational outcomes. By analyzing these aspects, the paper intends to provide insights into how AI can support Nigeria's economic growth and development through a more robust and innovative educational framework.

Conceptual Clarifications

Artificial Intelligence (AI)

Artificial intelligence (AI) is defined as the branch of computer science which deals with the intelligence of machines where an intelligent agent is a system that takes actions which maximize its chances of success (Saini, 2023). It is expressed further that it is the science and engineering of making intelligent machines, especially intelligent computer programmes which involve reasoning, knowledge, planning, learning, communication, perception and the ability to move and manipulate objects. Also, AI has been described as the development of a computer system that can



perform tasks that typically require human intelligence such as learning, problem-solving, reasoning, perception and language understanding.

Moreover, Jain and Jain (2019) viewed artificial intelligence as the impersonation of human knowledge procedures, for example, discourse and visual acknowledgement, interpretation of dialects and virtual decision-making by machines and robots. It is characterized as automated frameworks that can take part in human-like procedures such as learning, adapting, synthesizing, self-correction and use of data for complex processing tasks. In addition, Verma (2018) opined that AI is the study of intelligent machines and software that can reason, learn, gather knowledge, communicate, manipulate and perceive objects for carrying out a particular task. It is that area of computer science that mainly focuses on the making of such kind of intelligent machines that work and give reactions same like human beings. The aforementioned definitions have opined that artificial intelligence is a pseudo-intelligence whereby machines are manipulated to behave like human beings. It can be applied to different areas such as work, business and life generally. For instance, AI enhances the world of work with automation and process optimization, AI-powered tools can be used for productivity and efficiency, intelligent virtual assistants, AI-driven decision support systems and machine learning for predictive maintenance. In business, AI is used in marketing and customer service through the application of Chabot and conversational AI, intelligent supply chain management, predictive analytics for business insights, AI-powered fraud detection and security and so on. Generally, AI can be applied to life in different areas like healthcare and wellness, intelligent transportation systems, personalized recommendations and filtering and AI-powered home automation to mention but a few.

In Business Education, AI technologies have the capability of assisting teachers in lesson preparation (getting relevant and timely resource materials and putting them together), presentation (via different means/methods like teaching online through social media, Google Classroom, using a projector, et cetera) and evaluation of students (timely assessment of students' performance - easy collection, marking, grading and computation of results). Likewise, the students might have the opportunity of getting a wide range of reading materials which ordinarily could have been difficult for many to access or afford. AI technologies make learning easy and convenient as it give room for individual learning. Learning can be made interesting through the application of gamification and other technologies that give feedback to learners thereby motivating and enhancing their performance. Similarly, teaching and learning could be done globally through artificial intelligence; that is, AI technologies could assist teachers and learners to connect with any part of the whole world for contacts, knowledge sharing; and acquisition of new knowledge which enhances teaching and learning processes.

Business Education

Business education is a program designed to prepare students for the workforce by providing both theoretical and practical knowledge in business practices and pedagogy (Edeh & Olupayimo, 2023). According to Hamza and Garba (2020), a business education program equips its participants with the essential skills, knowledge, attitudes, abilities, values, and competencies needed to become effective educators and administrators. These individuals learn to utilize both human and



material resources to achieve optimal productivity with the skills they acquire. Similarly, Emesoba, Akudolu, and Agbo (2022) define business education as a course tailored to equip individuals with the necessary skills and theoretical knowledge for success in the business world, whether for employment or self-employment. It is a systematic and organized program of instruction aimed at transmitting knowledge, skills, ideas, attitudes, and technical know-how that are needed in business environments and for teaching others.

In other words, business education students must receive comprehensive, relevant, and up-to-date knowledge and skills to thrive in this technological era and remain competitive on a global scale. Business education programs encompass various fields, including Accounting, Office Technology and Management (OTM), Marketing, Insurance, and Entrepreneurship. These disciplines provide foundational knowledge essential for any business operation. Therefore, it is vital for anyone pursuing a business education to acquire robust skills that will endure in the global job market. This underscores the importance of integrating artificial intelligence into the curriculum to successfully achieve the program's objectives.

Economic Development

Economic development refers to the process through which a country or region enhances its economic, social, and political well-being (World Bank, 2023). This development reflects a nation's progress toward achieving economic growth, reducing poverty, and improving the overall standard of living for its citizens. Ultimately, the goal of economic development is to create sustainable growth that raises the standard of living and well-being of the population (IMF, 2024). It encompasses various dimensions such as increasing the output of goods and services, typically measured by GDP growth; developing physical systems like transportation, communication, and utilities which support economic activities; enhancing the education, skills, and health of the workforce to improve productivity; strengthening institutions and governance structures to promote efficient economic operations and uphold the rule of law; improving living standards, including access to quality healthcare, education, and social services and efforts to reduce inequality and ensure a fair distribution of economic benefits among different segments of the population (FRN, 2024).

In recent years, Nigeria has faced various economic challenges including high unemployment rates, inflation and a significant dependence on oil exports. However, the country has also made efforts to diversify its economy and promote economic growth through various initiatives such as diversification of the economy, infrastructure development, human capital development, promoting entrepreneurship and innovation. Nigeria aims to reduce its dependence on oil exports and promote growth in other sectors such as agriculture, manufacturing and services. The country is also investing in infrastructure projects, such as roads, bridges and energy systems to improve the business environment and promote economic growth. Similarly, the country is focusing on developing its human capital, through investment in education, healthcare and skills training by promoting entrepreneurship and innovation through initiatives like business incubators, accelerators and funding programmes, hence, the need for integration of artificial intelligence into

teaching and learning of education and Business education in particular being a skill-based programme to achieving the country's economic developmental goal.

Opportunities of AI in General and Business Education Curriculum

Many opportunities abound in the application of AI in teaching and learning of Business education for economic development. Nuseir et al. (2020) and Tan (2020) opined that AI augments human skills in the workplace and serves as an educational partner, enhancing content and competencies. Hence, it could be applied to various areas of the economy such as education, agriculture, healthcare, law, transportation, finance, security, et cetera as displayed pictorially below:

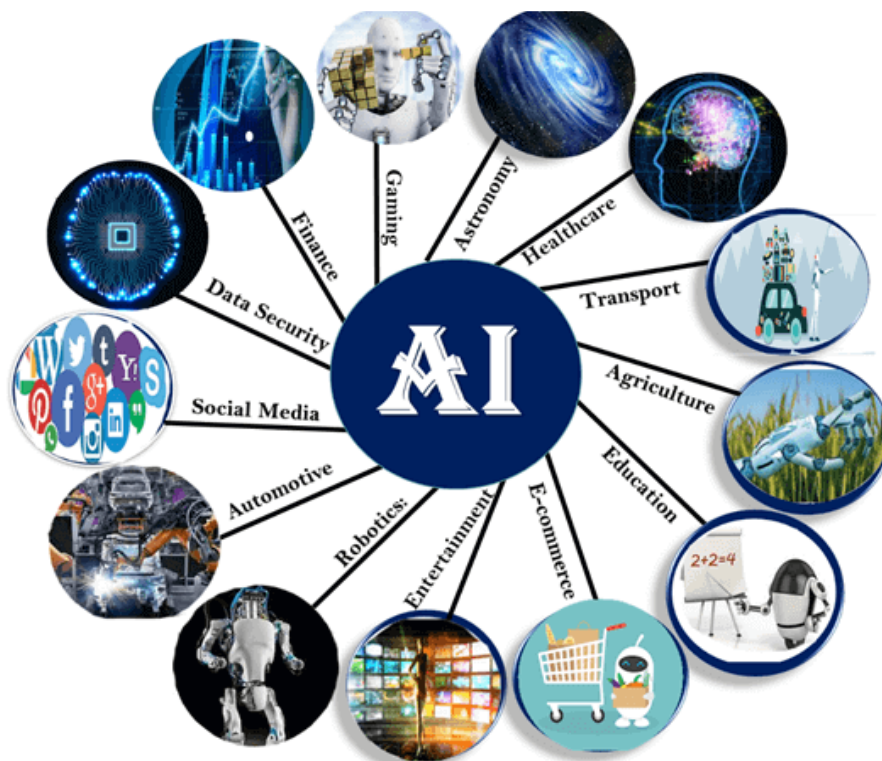


Figure 1: Applications of AI: Adapted from Saini, 2023

In education, artificial intelligence (AI) can help teachers perform better and engage students more effectively (Zhang & Aslan, 2021). AI can address the shortage of qualified teachers and educational resources. It changes how teaching and learning happen by improving personalization, engagement, and efficiency. According to Chukwu (2022), AI creates personalized learning experiences by examining individual student data and adjusting educational content and pacing. Adaptive learning technologies change the difficulty of materials based on how well students perform, meeting different learning needs. Several authors also pointed out that AI enhances personalized learning experiences and encourages communication among students. It creates custom learning materials based on students' assessments, addressing their strengths and weaknesses, and builds a comfortable environment for communication. It fosters networks among learners, increasing access to information for future generations (Chiu et al., 2023; Zhang & Aslan,



2021; Southworth et al., 2023; Hopcan et al., 2022). Nwogugu (2021) noted that AI-driven interactive and gamified learning improves student engagement. Furthermore, tools like virtual reality (VR) and simulations offer immersive learning experiences, making complex subjects easier to understand.

AI can analyze educational data to reveal learning patterns and instructional effectiveness. This helps improve teaching strategies and outcomes (Smith, 2022). It can also ease teaching and simplify learning results. AI automates routine tasks like scheduling, grading, and student tracking, allowing educators to focus on teaching and mentoring. It helps teachers stay updated with the latest teaching methods and industry trends through personalized professional development programs. For students, AI-driven virtual tutors provide continuous support and feedback, allowing them to enhance their skills. Adeyemo (2020) emphasized that AI can automate tasks such as grading and scheduling, decreasing the workload for educators and letting them concentrate more on teaching. AI also offers instant feedback through automated assessments, helping students quickly understand their performance and identify areas for improvement. Additionally, AI-powered assistive technologies help students with disabilities by providing tailored resources, such as speech-to-text and text-to-speech tools (Verma, 2018; Onyeonwuna & Ogoma, 2022).

The integration of artificial intelligence (AI) into business education in Nigeria is increasingly important, particularly due to the current economic landscape. As Nigeria seeks to diversify its economy away from a heavy reliance on oil, there is a pressing need to develop a workforce skilled in various industries such as fintech, agritech, and e-commerce. AI can play a pivotal role in this transition by equipping students with the necessary skills tailored to these emerging sectors, which are crucial for sustainable economic growth (Ogunleye, 2023). One of the key challenges facing the Nigerian job market is a significant skills mismatch, where the demand for high-tech skills, especially in areas like AI and data analytics, greatly outstrips supply. To address this issue, AI-driven educational tools can provide personalized learning experiences that better align with industry requirements. This approach has the potential to enhance student employability and career readiness (Olaniyan & Okemakinde, 2020).

Irukaku and Noleen (2018) emphasize the importance of equipping business education students with relevant skills that match their coursework, enabling them to demonstrate professional competencies in the job market and promote self-reliance. Consequently, educators are encouraged to integrate AI into their teaching methodologies to prepare students for a competitive economic landscape. Additionally, the integration of AI in business education can foster an entrepreneurial mindset among students. By encouraging creativity and problem-solving, AI can stimulate innovation and motivate students to develop new solutions and ventures (Adegboye & Ojo, 2022). This entrepreneurial drive can lead to the creation of new business opportunities and further technological advancement, contributing to overall economic growth.

Scalability and accessibility are also critical aspects of integrating AI into business education. A scalable business model allows for growth without significant structural changes, which is



essential for maintaining efficiency as operations expand. Online learning platforms powered by AI provide scalable solutions that increase access to quality education, particularly in resource-limited regions. AI technologies offer the potential to enhance educational outcomes through adaptive learning systems, intelligent tutoring, and real-time feedback mechanisms. These innovations can address diverse individual learning styles and paces, which is particularly beneficial in Nigeria's varied educational environment (Nwachukwu, 2021). Overall, the integration of AI into business education can help align Nigeria's educational practices with global best practices, ultimately improving student engagement and academic performance.

Challenges of Integrating AI in Business Education

Despite the potential for integrating AI into the teaching and learning of Business education to promote economic development, many challenges hinder its full incorporation into the curriculum. Surugiu et al. (2024) emphasize that while AI in education presents opportunities, it also introduces significant challenges for both educators and learners. They further assert that finding suitable tools to incorporate AI into the learning framework poses a challenge for both current and future generations. Although most students recognize AI as a valuable tool, their actual engagement with it in educational settings is often limited, as they tend to focus on only a few widely recognized tools.

Supporting this perspective, Siau (2018) highlights that AI is accompanied by several issues, despite its potential to improve the world. Some of these challenges include insufficient technological infrastructure, the high cost of integrating AI technologies into education, concerns regarding data privacy and security, and a lack of skills and knowledge necessary to effectively implement and utilize AI technologies. The substantial cost involved in acquiring and accessing AI technologies is a significant obstacle to their integration into Business education. Furthermore, some Business educators show resistance to change, which affects their readiness to undergo training that would enable them to incorporate AI into the teaching and learning process. Integrating AI with existing educational systems and curricula is particularly challenging for those who have not fully embraced AI, especially among those involved in curriculum development.

Ethical privacy concerns and cybersecurity risks also pose formidable challenges. Ensuring the protection of sensitive data and compliance with privacy regulations is critical for the successful integration of AI into the Business education curriculum. Additionally, Onyeonwuna and Ogona (2022) identified several other challenges, including inadequate power supply, unreliable internet services, insufficient support services, and a lack of digital skills. In Nigerian institutions, the availability of adequate infrastructure remains a significant challenge. However, integrating AI into Business education—a skill-based course—could provide scalable solutions to improve educational access and quality, even in resource-constrained environments. For instance, AI-powered platforms can facilitate remote learning opportunities and virtual laboratories, thereby addressing disparities in educational resources across different regions of Nigeria (Bello & Iorwerth, 2023). Such integration can help democratize access to quality education and promote inclusive growth.



Conclusion

Considering the global trend of technological advancement and the current economic situation in the country, the researchers assert the necessity of updating the Business education curriculum to incorporate AI-related courses. This enhancement will enable participants to foster creativity and innovation while acquiring skills essential for transforming the nation's economy. Furthermore, universal access to AI technologies would benefit both trainers and trainees by facilitating the integration of AI into Business education programs. In conclusion, the researchers believe that the benefits of incorporating AI into Business education far exceed the associated challenges. Nevertheless, to ensure that graduates of Business education programs can compete effectively in the global job market and contribute to Nigeria's economic development, it is imperative to address the challenges related to the integration of AI in teaching and learning.

Recommendations

Based on the above, the following recommendations were made:

- Institutions should provide adequate infrastructure and access to AI technologies to encourage users to engage with AI.
- Institutions need to conduct periodic targeted training programs that highlight success stories and foster a culture of creativity and innovation to address the resistance from business educators to adopting AI technologies for teaching and learning.
- Business educators should take advantage of training and retraining programs focused on the application of AI technologies in their teaching practices.
- The government should ensure adequate measures are in place to combat data piracy, and cybercrime, and address ethical considerations.

References

- Adegboye, M. A., & Ojo, O. (2022). Fostering entrepreneurship through AI in Nigerian Business education: Opportunities and strategies. *Journal of Entrepreneurship and Innovation*, 18(2), 112-130.
- Adeniran, A. A. (2023). AI and educational innovation in Nigeria: Prospects and challenges. *Journal of Nigerian Educational Technology*, 15(1), 45-62.
- Adeyemo, S. (2020). AI in educational administration: Enhancing efficiency and effectiveness. *Nigerian Journal of Education Administration and Planning*, 18(1), 45-59.
- Bello, S. A., & Iorwerth, P. O. (2023). Leveraging AI to overcome educational infrastructure challenges in Nigeria. *African Journal of Educational Technology*, 11(1), 25-39.
- Chiu, T., Xia, Q., Zhou, X., Chai, C. S., & Cheng, M. (2023). Systematic literature review on opportunities, challenges, and future research recommendations of artificial intelligence in education. *Computers and Education: Artificial Intelligence*, [e-journal] 4(100118) <https://doi.org/10.1016/j.caeai.2022.100118>.



- Chukwu, T., & Akintoye, A. (2022). A historical perspective on AI in education: From early systems to advanced technologies. *Journal of Educational Technology & Society*, 25(1), 20-35.
- Edeh, T. & Olupayimo, E. O. (2023). An evaluation of instructional delivery of Business education for skills acquisition in digital era in tertiary institution in Ondo State. *Nigeria Journal of Business Education*, 10(2), 225-262.
- Emeasoba, N. C., Akudolu, C. A., & Agbo, R. C. (2022) Utilisation of digital skills for teaching and learning of Business education in public Universities in the South-south Nigeria. *Nigeria Journal of Business Education*, 9(1), 79-90.
- Federal Republic of Nigeria (2024). Economic recovery and growth plan (ERGP) 2024 update. Federal Ministry of Finance. <https://www.finance.gov.ng/erp-update>.
- Hamzah, M. T., & Garba, B. Y. (2020). Relevance and prospects of information and communication technology (ICT) to Business education programme. *Nigerian Journal of Business Education*, 7(1), 240-248.
- Hopcan, S., Polat, E., Ozturk, M. E., & Ozturk, L. (2022). Artificial intelligence in special education: A systematic review. *Interactive Learning Environments*, [e-journal]. <https://doi.org/10.1080/10494820.2022.2067186>.
- International Monetary Fund (IMF, 2024). World economic outlook: Recovery during a challenging era. *International Monetary Fund*. <https://www.imf.org/en/Publications/WEQ>.
- Irukaku, O. I., & Noeleen, M. (2018). Strategies for effective skill acquisition by business education students: Implication for sustainable human capital development, *Nigerian Journal of Business Education*, 5(2), 195-205.
- Jain, S., & Jain, R. (2019). Role of AI in higher education: An empirical investigation. *International Journal of Research Analytical Reviews (IJRAR)*, 6(2), 144-150.
- Nuseir, M., Basheer, M. F., & Aljumah, A. (2020). Antecedents of entrepreneurial intentions in smart city of Neom Saudi Arabia: Does the entrepreneurial education on artificial intelligence matter? *Cogent Business and Management*, [e-journal] 7(1), 1-16. <https://doi.org/10.1080/23311975.2020.1825041>.
- Nwachukwu, N. (2021). AI in education: Enhancing learning outcomes in Nigerian institutions. *Journal of Educational Advancement*, 22(3), 67-85.
- Nwogugu, M. (2021). Enhancing student engagement with AI-driven interactive learning tools. *Journal of Educational Innovations*, 13(2), 89-102.
- Ogunleye, F. (2023). AI and Nigeria's economic diversification: A roadmap for integrating technology into business education. *Nigerian Journal of Economic Development*, 14(2), 44-59.



- Okoro, E., & Eze, S. (2022). Challenges in integrating AI into Nigerian educational institutions. *Nigerian Journal of Educational Development*, 10(3), 34-50.
- Olaniyan, D., & Okemakinde, T. (2020). Addressing skill gaps in Nigeria: The role of AI in Business Education. *Journal of Nigerian Labour Economics*, 29(4), 88-101.
- Olupayimo, E. O. (2021). Rebranding business education in Nigeria through professionalization. *Nigerian Journal of Business Education*, 8(3), 36-50.
- Onyeonwuna, O. S., & Ogona, A. U. (2022). Teaching and learning in the new normal: Opportunities and challenges of distance learning amid COVID-19 pandemic. *Nigerian Journal of Business Education* 9(1), 70-78.
- Saini, N. (2023). Research paper on artificial intelligence & its applications. *International Journal for Research Trends and Innovation*, 8(4), 357-360.
- Siau, K. (2018). Education in the age of artificial intelligence: How will technology shape learning? *The Global Analyst*, 7(3), 22-24.
- Southworth, J., Migliaccio, K., Glover, J., Glover, J., Reed, D., McCarty, C., Brendemuhl, J., & Thomas, A. (2023). Developing a model for AI across the curriculum: Transforming the higher education landscape via innovation in AI literacy. *Computers and Education: Artificial Intelligence*, [e-journal] 4(100127), 1-10. <https://doi.org/10.1016/j.caeai.2023.100127>.
- Smith, J. (2022). Adapting vocational education to the Fourth Industrial Revolution. *Journal of Technology and Education*, 48(5), 78-93.
- Surugiu, C., Grădinaru, C. & Surugiu, M. R. (2024). Artificial Intelligence in Business Education: Benefits and Tools. *Amfiteatru Economic*, (65), 241-258. <https://doi.org/10.24818/EA/2024/65/241>
- Tan, C. (2020). Digital Confucius? Exploring the implications of artificial intelligence in spiritual education. *Connection Science*, e-journal, 32(3), 280-291. <https://doi.org/10.1080/09540091.2019.1709045>.
- Verma, M. (2018). Artificial Intelligence and its scope in different areas with special reference to the field of education. *International Journal of Advanced Educational Research*, 3(1), 5-10.
- World Bank (2023). Nigeria's economic update: Navigating through challenges. World Bank. <https://www.worldbank.org/en/country/nigeria/publication/nigerias-economic-update>.
- Zhang, K., & Aslan, A. B. (2021). AI technologies for education: Recent research and future directions. *Computers and Education: Artificial Intelligence*, 2(100025), 1-11. <https://doi.org/10.1016/j.caeai.2021.100025>.