

Contemporary Issues on Innovation Focus on Artificial Intelligence for efficiency in Nigerian Health and Educational System

Joy Harry

Rivers State College of Health Science and Management Technology

Oro-Owo, Rumueme, Port Harcourt

joylucus97@gmail.com - 08033099992

Abstract

This study investigated the contemporary issues on innovation focus on artificial intelligence (AI) for efficiency in Nigerian health and educational system. The study employed the qualitative research method. The concept of artificial intelligence and its impact on health and educational sector of Nigeria was extensively discussed. The contemporary issues of Artificial Intelligence as revealed in the study are **bias in the data**, limited knowledge, data piracy and security, amongst others. The study concluded that AI technology can certainly cater for greater services in the health and educational sector of the Nigerian economy. The implementation of the AI technology in the healthcare sector can be used to understand medical data and reach the right conclusion without direct human input. The study finally suggests that governments and educational institutions should encourage generalist education, emphasizing future-resilient skills, so that individuals are better prepared for the future work economy, as well as adopt systems to personalize education, generate literacy on AI issues, and encourage lifelong learning.

Keywords: artificial intelligence, contemporary issues, health and educational system

Introduction

The replication of human intellectual processes by machines, particularly computer systems, is known as Artificial Intelligence, and it is one of the modern world's fastest developing technologies. Artificial intelligence applications are considered as a part of an organization's competitive intelligence of organizations (Ranjan & Foropon, 2021). According to the general three-dimensional model of artificial intelligence in influencing innovation, the first dimension indicates that artificial intelligence explores the success of search and innovation algorithms and then disseminates them through commercially available smart devices and services, and the second dimension is the impact of automation research and artificial intelligence to explore existing best practices and their reflection on the organization's ability to launch services based on artificial intelligence, while the third dimension relates to shaping the business context using artificial intelligence.

This indicates that artificial intelligence can contribute to raising the ability of organizations to provide organizational innovations (Al-Otaibi et al., 2021; Lee, 2021). In recent years, Artificial Intelligence (AI) has emerged as a transformative technology with the potential to revolutionize various sectors, including healthcare and education. In Nigeria, a country facing unique challenges in its health and educational systems, the adoption of AI-driven innovations hold the promise of significantly improving efficiency, accessibility, and outcomes in these critical areas.

Statement of the Problem

With new technological advancements come new opportunities as well as challenges. The Nigerian healthcare and educational systems face persistent challenges that hinder their effectiveness and accessibility. These challenges stem from a range of issues including inadequate infrastructure, resource constraints, and limited access to quality services. In the context of these challenges, the integration of Artificial Intelligence (AI) into the Nigerian health and educational systems presents some opportunities. However, Artificial intelligence (AI) is missing from existing publications presented in the state-of-the-art above. This study will therefore fill the gap by introducing the importance of AI in the health care and educational system in Nigeria and its contemporary issues.

Objectives

The objective of this study is to investigate contemporary issues on innovation in relation to Artificial Intelligence (AI) for efficiency in Nigerian health and educational system.

The specific objectives are to;

- (i) Find out the relationship between Artificial Intelligence (AI) and efficiency in the Nigerian healthcare and educational system.
- (ii) Determine the contemporary issues affecting Artificial Intelligence in the Nigerian healthcare and educational system.

Significance of the Study

The study is significant as the findings from this study will assist organizations, educators and healthcare professionals to bring to limelight the effect of Artificial Intelligence (AI) on Nigerian healthcare and educational system and its contemporary issues. It will also assist scholars and make valuable addition to the knowledge that has been acquired from other studies and may help other individuals and researchers who might wish to undertake further studies.

Literature Review

Artificial Intelligence

Artificial intelligence is superior to natural intelligence in that it is more consistent, durable, faster in processing and publishing, every step it takes can be documented, and it can perform certain tasks much faster and better than humans (Al-Hawamdeh & Alshaer, 2022). AI is used to simplify the management of IT processes and accelerate, automate problem-solving in modern and complex IT operating environments. Iftikhar, et al. (2020) define artificial intelligence as a set of techniques and models that are used to build machines capable of simulating human intelligence with the help of technological devices to reproduce advanced knowledge that facilitates and accelerates the achievement of goals. Artificial intelligence is also based on the development of smart programs capable of learning, thinking, collecting, and perceiving knowledge, and these complex programs perform tasks through environmental sensing and response processes and can simulate the behaviors of individuals, thinking and acting smart decisions (Cockburn et al., 2018).

Based on these definitions, the concept of AI refers to the introduction to making machines think and act as human beings, making it possible for the machines to perform human tasks and adapt to or interact with its surrounding environment (Kamble & Shah, 2018). However, it is important to note that what we call AI changes with time as technology advances. When certain AI technologies become highly accessible to us, it is taken for granted and not called AI anymore. This is because the term AI is perceived as a future technology. Some of the goals of AI is learning, reasoning and perception. Using these characteristics enables AI to rationalize and take actions towards the highest probability of achieving its goal (Frankenfield, 2020). The above-mentioned characteristics give AI enormous potential regarding problem solving. With the ability to think and act as human beings, solving problems that human beings do becomes accessible to AI. AI programming focuses on three cognitive skills: learning, reasoning and self-correction.

Innovation

Innovation is the practical implementation of ideas. Innovation can *refer to something new*, such as an invention, or the practice of developing and introducing new things. An innovation is often a new concept or modernizing an already existing product. Many definitions have been proposed to explain innovation, and as a result the term has gained greater ambiguity (Garcia & Calantone, 2002). A number of process models have been developed in the literature suggesting that innovation consists of a variety of different phases: idea generation, research design and development, prototype production, manufacturing, marketing and sales (Johnson, 2001; Knox, 2002; Poolton & Ismail, 2000). However, theorists have suggested that there is more to innovation than the process. Innovation thus has many facets and is multidimensional. Also many definitions of innovation focus on the concept of newness. The newness theme is especially important to understanding the link between Artificial Intelligence and Innovation.

Healthcare system in Nigeria: challenges and opportunities

Nigeria's healthcare system grapples with numerous challenges, such as inadequate infrastructure, a shortage of healthcare professionals, and limited access to quality medical care in rural areas. These challenges contribute to suboptimal healthcare outcomes and hinder progress towards achieving universal healthcare coverage (Ranjan & Foropon, 2021). However, AI offers an array of solutions that could transform the healthcare landscape. AI-powered diagnostic tools can enhance the accuracy and speed of disease identification, allowing for early detection and treatment. Telemedicine applications driven by AI can bridge the gap between urban medical facilities and remote regions, providing access to expert medical advice even in underserved areas. Additionally, predictive analytics can assist healthcare administrators in efficiently allocating resources and planning for outbreaks. Despite these opportunities, implementing AI in healthcare requires navigating regulatory hurdles, addressing data privacy concerns, and ensuring equitable access to technology (Lee, 2021).

Application of artificial intelligence in healthcare system

Lee (2021) highlighted the application of Artificial Intelligence in the health care system; it is stated below.

Diagnosis and treatment planning: AI can be used to analyze imaging, such as X-rays and MRIs, to help doctors identify diseases and plan treatment. For example, AI-powered algorithms can detect signs of cancer in mammograms with a high degree of accuracy, which can help doctors make a diagnosis and plan treatment more quickly.

Predictive Analytics: Electronic health records and other patient data can be analyzed by AI to predict which patients are at risk of developing certain conditions. This may help doctors intervene early, before a condition becomes more serious, and can also help healthcare organizations allocate resources more effectively (Kim & Huh, 2021).

Drug Discovery and Development: AI can be used to examine data on drug interactions and side effects, as well as to predict which compounds will be most effective in treating certain conditions. This can speed up the drug discovery and development process, which may ultimately lead to new treatments for patients.

Virtual Assistants and Chatbots: AI-powered virtual assistants and chatbots can help patient's access healthcare information and services more easily. For example, a chatbot can answer patients' questions about their symptoms or help them schedule an appointment with a doctor.

Artificial Intelligence and educational system in Nigeria

The Nigerian educational system also faces significant challenges, including limited access to quality education, outdated teaching methodologies, and a lack of personalized learning experiences. These issues contribute to low literacy rates and hinder the development of a skilled workforce. Integrating AI into education has the potential to address these challenges and foster innovation (Cockburn et al., 2018).

AI-powered learning platforms can offer personalized learning experiences tailored to each student's pace and learning style, reducing dropout rates and improving educational outcomes. Virtual tutors and intelligent content delivery systems can enhance the quality of education, especially in areas with a shortage of qualified teachers. Furthermore, AI-driven data analytics can help educational institutions identify trends and optimize curriculum design to align with market demands. However, successful implementation requires overcoming barriers related to digital infrastructure, teacher training, and ensuring that AI technologies do not exacerbate existing inequalities (Al-Hawamdeh & Alshaer, 2022).

Contemporary Issues of Artificial Intelligence

Artificial Intelligence (AI) is developing with such an incredible speed, sometimes it seems magical. There is an opinion among researchers and developers that AI could grow so immensely strong that it would be difficult for humans to control. Humans develop AI systems by introducing into them possible intelligence they could, for which the humans themselves now seem threatened (Lee, 2021). The following are the contemporary issues of Artificial intelligence.

Data privacy and security: The use of AI in healthcare requires large amounts of patient data, which raises concerns about data privacy and security. It is important to ensure that patient data is protected from unauthorized access and that patients have control over how their data is used (Zraaqat, 2020).

Bias in the data: AI systems can be biased if the data they are trained on is not representative of the population they will be used to serve. This may lead to inaccurate or unfair results, particularly for marginalized communities.

Lack of transparency: Many AI systems are considered "black boxes" because it is difficult to understand how they arrived at a particular decision. This lack of transparency can make it difficult for doctors and other healthcare professionals to trust the results of an AI system.

Regulation and Governance: There is currently a lack of clear regulations and guidelines for the use of AI in healthcare. This can make it difficult for healthcare organizations to know how to use the technology responsibly and can also make it difficult for patients to know what to expect when they interact with an AI system.

Lack of understanding: Many healthcare professionals and patients may not have a good understanding of how AI works and what it can and cannot do. This can lead to unrealistic expectations and mistrust of the technology.

Job displacement: AI is a fast-evolving technology with great potential to make workers more productive, to make firms more efficient, and to spur innovations in new products and services. At the same time, AI can also be used to automate existing jobs and exacerbate inequality, and it can lead to discrimination against workers. AI systems have already started replacing the human beings in the industry. It should not replace people in the sectors where they are holding dignified positions which are pertaining to ethics such as nursing and surgeon (Trocin et al., 2021).

Conclusion

The AI technology can certainly cater for greater services in the health and educational sector of the Nigerian economy. The implementation of the AI technology in the healthcare sector can be used to understand medical data and reach the right conclusion without direct human input. It can be applied in diagnosis processes, treatment protocol development, drug development, personalized medicine, and patient monitoring and care.

From the study Artificial Intelligence (AI) is driving innovation and exiting traditional design models. As Nigeria strives to enhance its healthcare and educational systems, the integration of AI-driven innovations holds immense promise. By leveraging AI technologies, the country can overcome traditional limitations and create more efficient, accessible, and effective systems in healthcare and education. However, realizing this potential requires careful consideration of ethical, regulatory, and accessibility concerns, ensuring that the benefits of AI are equitably distributed across all segments of the population.

To fully realize these benefits, significant challenges such as data privacy and security, bias in the data, lack of transparency, regulation and governance, and lack of understanding need to be overcome. It is crucial that healthcare organizations, regulators and researchers work together to ensure that the technology is used in an ethical, actionable and meaningful manner.

Contribution to Knowledge

Policymakers, administrators, and decision-makers in the Nigerian government, healthcare, and education sectors can make informed decisions about the allocation of resources, investments, and policy reforms to enhance the quality and accessibility of services. The provided insights guide them in making choices that align with technological advancements and societal needs.

This exploration raises awareness among stakeholders about the potential benefits and pitfalls of adopting AI technologies. It educates individuals about how AI can be harnessed to address critical issues in these sectors.

Suggestions

1. Governments and educational institutions should encourage generalist education, emphasizing future-resilient skills, so that individuals are better prepared for the future work economy, as well as adopt systems to personalize education, generate literacy on AI issues, and encourage lifelong learning.
2. Offer training programs for healthcare professionals to familiarize them with AI technologies. This will enable them to effectively use AI tools and contribute to their continuous improvement.
3. Develop clear and robust regulatory frameworks that govern the ethical use of AI in healthcare and education. This should encompass data privacy, algorithm transparency, and accountability.

References

- Al-Otaibi, S., Alkhamash, H. I., & Ullah, N. (2021). Short-and long-term predictions of novel corona virus using mathematical modeling and artificial intelligence methods. *International Journal of Modeling, Simulation, and Scientific Computing, 12*(03), 2150028.
- Al-Hawamdeh, M. M., & Alshaer, S. A. (2022). Artificial intelligence applications as a modern trend to achieve organizational innovation in Jordanian commercial banks. *The Journal of Asian Finance, Economics and Business, 9*(3), 257-263.
- Cockburn, I. M., Henderson, R., & Stern, S. (2018). The impact of artificial intelligence on innovation: An exploratory analysis. In *The economics of artificial intelligence: An agenda* (pp. 115-146). University of Chicago Press.
- Frankenfield, J. (2020). *Artificial intelligence (AI)*. Investopedia.
- Garcia, R. & Calantone, R. (2002). A critical look at technological innovation typology and innovativeness terminology: a literature review. *Journal of Product Innovation Management, 8*(19), 110-132.
- Iftikhar, P., Kuijpers, M. V., Khayyat, A., Iftikhar, A., & De Sa, M. D. (2020). Artificial intelligence: a new paradigm in obstetrics and gynecology research and clinical practice. *Cureus, 12*(2).
- Johnson, D. (2001). What is innovation and entrepreneurship? Lessons for larger organisations. *Industrial and Commercial Training, 33*(4), 135-140.
- Kamble, R., & Shah, D. (2018). Applications of artificial intelligence in human life. *International Journal of Research–Granthaalayah, 6*(6), 178-188.
- Kim, S. K., & Huh, J. H. (2021). *Artificial intelligence based electronic healthcare solution: Advances in computer science and ubiquitous computing*. Springer.
- Knox, S. (2002). The boardroom agenda: developing the innovative organization. *Corporate Governance, 2*(1), 27-39.
- Lee, D. (2021). Application of artificial intelligence-based technologies in the healthcare industry: Opportunities and challenges. *International Journal of Environmental Research and Public Health, 18*(1), 271.
- Poolton, J. & Ismail, H. (2000). New developments in innovation. *Journal of Managerial Psychology, 15*(8), 795-811.
- Ranjan, J., & Foropon, C. (2021). Big data analytics in building the competitive intelligence of organizations. *International Journal of Information Management, 5*(6), 102-113.

- Trocin, C., Hovland, I. V., Mikalef, P., & Dremel, C. (2021). How Artificial Intelligence affords digital innovation: A cross-case analysis of Scandinavian companies. *Technological Forecasting and Social Change, 17(3)*, 121-118.
- Zraqat, O. M. (2020). The moderating role of business intelligence in the impact of big data on financial reports quality in Jordanian telecom companies. *Modern Applied Science, 14(2)*, 71-85.