



Journal homepage:
<https://www.ijedm.com>

**International Journal of
Educational Management,
Rivers State University.**

Cultivating a Culture of Lifelong Learning for Tertiary Institution Staff in Rivers State Through Artificial Intelligence

Victoria Osaruchi Sam-Kalagbor PhD

Department of Educational Management, Rivers State University, Nigeria.

Corresponding Authors' Email: viruchbeautyhome@gmail.com

Abstract

This paper explores cultivating a culture of lifelong learning for tertiary institution staff in Rivers State through artificial intelligence. In light of the dynamic nature of the educational environment, it is imperative to adopt innovative strategies that enable educators to acquire the necessary skills and expertise to thrive in their professional capacities. Artificial intelligence (AI) provides a transformative avenue through which personalised learning routes, adaptive learning environments, data-driven insights, and virtual learning communities can be facilitated. Nevertheless, the process of integration also gives rise to significant ethical concerns that must be carefully examined. These concerns encompass issues such as the protection of data privacy, the potential for bias, the need for transparency, the promotion of equity, and the establishment of effective governance mechanisms. In order to optimise the advantages of AI-driven professional development while simultaneously tackling the aforementioned obstacles, the research proposed a holistic strategy encompassing personalised learning, stringent data privacy protocols, strategies to mitigate bias, transparent AI algorithms, principles of inclusive design, ethical governance frameworks, and ongoing monitoring and evaluation. By implementing these tactics, higher education institutions in Rivers State can effectively include artificial intelligence (AI) as a potent instrument for fostering a culture of ongoing professional development among educators, thereby augmenting the overall educational standards in the area.

Keywords: Artificial Intelligence (AI), Professional Development, Continuous Learning and Ethical Considerations

Introduction

As the world progresses into the digital age, educational institutions are under increasing pressure to adapt to the changing needs of stakeholders, which include not only students but also staff in the usage of Artificial Intelligence (AI) as a driven factor in promoting a culture of continuous learning of staffs. One of the defining features of AI is its capacity to process vast amounts of data, learn from it, and make informed decisions or recommendations base on the needs of the users given a directive prompt. Again, artificial intelligence is characterized by its ability to perform tasks that typically require human intelligence such as learning, reasoning, problem-solving, and decision-making which makes significant inroads into various sectors which education is not excluded. (Marr, 2020). The advent of AI in education

brings forth innovative solutions that can personalize learning, automate administrative tasks, and provide real-time data analytics to improve educational outcomes. In line with teacher professional development, AI presents opportunities for creating more effective, personalized, and continuous learning experiences for classroom teachers, which are important for maintaining a high standard of teaching and adapting to the increasing changes in the educational system.

AI analyze the unique needs and preferences of staff enabling the customization of learning experiences (Panigrahi, 2020). Today, artificial intelligence is one of the emerging technologies which are capable of altering every aspect of our social interactions. In education, AI has begun producing new teaching and learning solutions that are now undergoing testing in different areas. AI-driven systems can assess an educator's proficiency in specific teaching methodologies or identify gaps in their subject matter. AI has a rich history dating back to the mid-20th century. It began with rule-based systems and symbolic AI, where experts manually encoded knowledge into computers. The field progressed with the development of machine learning algorithms and neural networks. Recent advancements, such as deep learning and reinforcement learning, have propelled AI to new heights, enabling it to excel in tasks like autonomous learning strategies. As AI systems become more prevalent in everyday life, ensuring responsible development, transparency, and ethical use of AI has become a pressing concern for researchers, policymakers, and society at large in fostering a culture of continuous learning in tertiary institutions in Rivers State (Bryson et al., 2017).

Continuous learning is no longer an option; it's a necessity. To meet this need, the integration of Artificial Intelligence (AI) into teacher professional development emerges as a transformative solution. AI offers promising avenues for individualized learning experiences. Nwosu (2020) suggested that AI algorithms can analyze the unique needs and preferences of teachers, creating tailored professional development plans. This personalization ensures that educators receive the precise training required to enhance their skills and knowledge during classroom interactions. AI-driven platforms that offer adaptive learning materials and assessments are also gaining prominence. According to Okon (2019), these platforms adjust content difficulty based on individual teacher progress, ensuring that educators are challenged at the right level and facilitating continuous improvement. Moreover, data-driven decision-making in education has been emphasized by educational expert Adesina (2021). He further pointed that AI can analyze data on teacher performance and the effectiveness of professional

development programs, enabling institutions to make informed decisions for improvement by identifying challenges during classroom instructions. Additionally, the use of AI chatbots to assist teachers has been investigated. According to Okafor (2022), AI-driven chatbots can offer users information, answer queries, and provide an outline for a specific assignment, all of which can improve the learning experience for teachers. AI systems that track teachers' progress and provide prompt assistance when problems arise have also been suggested. Adebayo (2020) asserted that these solutions can guarantee that instructors get the assistance they require in practical circumstances. Ethical considerations surrounding AI integration in education have been highlighted by Adeyemi (2019) who emphasized the importance of ensuring data privacy and ethical use of AI to maintain trust in the education system. The integration of Artificial Intelligence (AI) into education necessitates a thoughtful examination of the ethical implications to ensure that educators' rights and privacy are protected. One critical ethical consideration is data privacy. As Okeke (2018) aptly noted, AI systems often require access to vast amounts of data, including teachers' personal information and learning patterns. While this data is essential for personalization and improvement, it must be handled with utmost care to prevent unauthorized access or breaches.

Furthermore, the issue of bias in AI systems raises ethical concerns. AI algorithms may inadvertently perpetuate biases present in the data they are trained on, as emphasized by Nwosu (2021). In the context of teacher professional development, biases in AI systems could lead to unfair assessment or unequal access to learning opportunities. Vigilant oversight and regular audits are essential to mitigate algorithmic bias and ensure fairness in AI-driven learning experiences. A related ethical concern is transparency and accountability in AI decision-making. According to the research by Adewale (2019), when AI systems make recommendations or decisions related to teacher development, it may be challenging for educators to understand the rationale behind these suggestions. This lack of transparency can erode trust in AI systems and hinder their adoption. Educators should be provided with clear explanations of how AI-driven decisions are reached, ensuring accountability and ethical use.

The need for continuous learning among educators and staff in Rivers State's tertiary institutions is underscored by global trends in education. The 21st century has witnessed an unprecedented transformation in the way knowledge is created, disseminated, and accessed. The traditional models of professional development that were once sufficient are now being outpaced by the demands of a knowledge-driven economy and an information-savvy generation of students

(UNESCO, 2020). In a world where information is constantly evolving and new knowledge is being generated at an unprecedented pace, the concept of continuous learning has gained paramount importance. Continuous learning is more than a buzzword; it is a strategic approach to personal and professional growth that acknowledges the ever-changing nature of knowledge and skills required for success (Schleicher, 2019). The imperative for continuous learning extends to educators and staff within tertiary institutions. Traditional methods of professional development, such as periodic workshops or seminars, have limitations. They often lack personalization, and the knowledge acquired may become outdated before it can be effectively applied in practice. This inadequacy necessitates a paradigm shift in professional development, aligning it with the principles of continuous learning that AI can facilitate.

The idea behind AI-driven professional development in Rivers State's tertiary institutions stems from the understanding that the state's academic staff and non-teaching staff are its most valuable assets. The state wants to establish an environment where lifelong learning is valued and permeates all of its higher institutions. This vision is consistent with current global educational trends that emphasize the value of adjusting to the changing requirements of the information economy (World Bank, 2021). The inadequacy of conventional professional development methods is exacerbated by the growing expectations of students who have grown up in the digital age, as well as the evolving needs of the job market. To address these challenges, educational institutions must embrace innovative approaches to professional development that align with the principles of continuous learning. Artificial Intelligence (AI) has emerged as a disruptive technology with the potential to revolutionize professional development by offering personalized and data-driven learning experiences for educators. However, despite the promise that AI holds, the integration of AI-driven professional development in Rivers State's tertiary institutions faces several pressing issues and challenges that warrant in-depth investigation:

In Rivers State, Nigeria, there is an urgent need to foster a culture of lifelong learning among staff in tertiary institutions to adapt to the rapid advancements in education and technology. The integration of Artificial Intelligence (AI) into professional development programmes offers a promising solution to this challenge. AI has the potential to transform how staff and administrative staff acquire new skills and knowledge by providing personalized, data-driven learning experiences. However, the effective implementation of AI-driven professional development faces several significant issues that must be addressed. A major challenge is the

widespread lack of awareness and understanding of AI among staff. This knowledge gap hinders the adoption and effective use of AI-driven tools and resources, limiting their potential benefits. Furthermore, AI systems require access to sensitive personal information, raising concerns about data privacy and the ethical use of AI. Ensuring that this data is handled responsibly is crucial to maintaining trust and protecting the privacy of academics.

Another critical issue is the potential for AI systems to perpetuate biases present in their training data. Such biases can lead to unfair assessments and unequal access to learning opportunities for staff. Addressing these biases requires careful oversight and regular audits to ensure fairness and equity in AI-driven professional development. Additionally, traditional methods of professional development, such as periodic workshops or seminars, often lack the personalization and adaptability that AI can offer. This highlights the need for innovative approaches that align with continuous learning principles and are tailored to the unique needs of academics. The practical challenges of implementing AI-driven professional development also include limited infrastructure and resources in some institutions, which may impede the adoption of new technologies. There may also be resistance to change from staff who are unfamiliar with or skeptical of AI. Overcoming these barriers is essential for successfully integrating AI into professional development programmes.

Given these challenges, research is needed to explore effective strategies for incorporating AI into the professional development of staff in Rivers State's tertiary institutions. Such research will provide valuable insights into creating a framework that leverages AI to enhance learning opportunities, ensuring that academics are equipped to meet the evolving demands of the educational system and cultivate a culture of lifelong learning which prompted the investigation of this research.

Theoretical Framework

Diffusion of Innovation Theory

Rogers' theory of the diffusion of innovations was postulated by Rogers in (1962) as pointed out in the work of Nwuke (2022). The theory posited that the process of individuals, organisations, or communities embracing a novel innovation unfolds gradually. The theory provides a comprehensive explanation of the mechanisms through which new concepts or ideas are communicated and adopted within a specific population. The process consists of five

fundamental phases, specifically knowledge acquisition, persuasion, decision-making, implementation, and confirmation.

1. Knowledge: The individual acquires knowledge of the innovation through focused and concise practise. During this first stage, individuals are exposed to the innovation for the first time, gaining awareness of its presence and cultivating a basic understanding of its purpose and potential benefits that will accrue from the innovation

2. Persuasion: The individual develops an inclination towards the innovation and actively pursues additional information. During this stage, individuals develop a favourable attitude towards the innovation. The individuals evaluate the advantages of the subject being assessed and compare it with existing alternatives, considering multiple factors such as cost, suitability for their needs, and potential risks.

3. Decision Making: The process of decision making involves the careful evaluation of the strength and weaknesses associated with the adoption of the innovation, leading to a conclusive determination to adopt it. Individuals partake in a purposeful procedure to ascertain the feasibility of embracing or dismissing the innovation. The decision-making process is susceptible to various internal and external factors, encompassing personal perceptions, societal norms, and the perspectives of influential individuals.

4. Implementation: The individual starts using the novel concept (Innovation). Once individuals have made the decision to accept, they proceed with the implementation of the innovation in their respective daily lives or work environments. This may involve the acquisition of knowledge related to the product, the adjustment of established routines, or the alteration of processes to accommodate the innovation.

5. Confirmation: Confirmation is the stage in which the individual assesses the outcomes of adopting the innovation and makes a determination regarding its ongoing utilisation. The concept involves the continuous adoption and application of the innovation by individuals, leading to either the validation or dismissal of their initial choice. If the innovation successfully meets the users' expectations and effectively delivers the desired benefits, there is a strong likelihood that it will be embraced and spread through informal channels of communication. Nwuke (2022) considered the usage of a virtual reality learning platform as an example, using the various stages. In respect to the first stage, knowledge acquisition, educators and learners become aware of the availability and potential benefits of utilising artificial intelligence. It has

been found that this technology has the capability to provide captivating and interactive educational experiences, thereby enhancing students' interest and comprehension across various academic fields. During the second stage of persuasion, teachers evaluate the advantages of incorporating artificial intelligence into their instructional methodologies. Factors such as enhanced student motivation, the potential for experiential learning, and alignment with instructional goals are considered in their evaluation. In order to enhance their understanding and gain additional insights, individuals may consider engaging in discussions with colleagues or attending professional development events such as workshops and conferences.

Rogers in Nwuke (2022) posited that the rate of adoption of an innovation is influenced by five key factors, namely relative advantage, compatibility, complexity, trialability, and observability. Various factors have the potential to influence an individual's inclination towards either embracing or dismissing an innovation. The application of the Diffusion of Innovation theory holds significant relevance in the context of artificial intelligence on teacher professional development for sustainable education in public schools in Rivers State. The theory elucidates the manner in which individuals, encompassing university administrators, are subject to the influence of specific factors when making decisions regarding the adoption of a novel innovation. The theory emphasizes the significance of effective communication and the involvement of early adopters in facilitating the diffusion of innovation within the organisation. The successful implementation of artificial intelligence necessitates the establishment of efficient communication channels that facilitate the dissemination of information, fostering awareness, comprehension, and expertise regarding emerging technologies among relevant stakeholders. Therefore, the relevance of this theory to the study is that it facilitates comprehension of the adoption process and enables the formulation of strategies to enhance its effectiveness on teacher professional development for sustainable education in public schools in Rivers State.

Conceptual Clarifications

Fostering a Culture of Continuous Learning Using Artificial Intelligence

Continuous learning is not just a buzzword, it's a necessity in today's fast-changing and competitive world. But how do you create a culture of continuous learning in your organization, where employees are motivated and empowered to learn new skills, share knowledge, and grow professionally? Here are some tips to help you foster a learning mindset and environment in your organization. one of the first steps to foster a culture of continuous learning is to align

learning with your organization's vision, mission, and goals. This means that you need to communicate clearly and regularly what your organization is trying to achieve, why learning is important, and how learning contributes to the success of the organization and the individual. You also need to identify the skills and competencies that are relevant and in demand for your organization, and provide learning opportunities and resources that match them fostering a culture of continuous learning using Artificial Intelligence (AI) is a forward-looking approach that can revolutionize how organizations embrace ongoing development and adaptation. In this discussion, we will explore key aspects of this concepts:

Personalized Learning Journeys

One of the significant benefits of AI in continuous learning is the ability to tailor learning experiences to individual needs. As Siemens and Gasevic (2017) emphasize, AI algorithms can analyze learners' preferences and past performance to create personalized learning journeys. This personalization ensures that each individual's learning path is optimized for their unique strengths and weaknesses.

Adaptive Learning Environments

AI-driven systems are particularly adept at providing adaptive learning environments. Koedinger et al. (2012) highlight that these systems can dynamically adjust the difficulty of assignments and content based on real-time performance data. Learners are consistently challenged at the right level, maximizing engagement and knowledge retention.

Data-Driven Insights

AI's data analytics capabilities are instrumental in fostering continuous learning. Hill and Barber (2019) argue that AI can provide educators and learners with real-time insights into their progress. This data-driven approach allows for immediate course correction and targeted interventions when needed.

Accessibility and Inclusivity

AI-powered learning tools can enhance accessibility and inclusivity. Li et al. (2019) suggest that AI can assist learners with diverse needs, such as language barriers or disabilities, by offering customized support and adapting content delivery methods.

Ongoing Feedback and Assessment

In the realm of continuous learning, frequent feedback and assessment are essential. Almadhi et al. (2020) demonstrate that AI-enhanced assessment tools can provide continuous feedback on learners' performance, helping them track their progress and make necessary improvements.

Lifelong Learning Mindset

Fostering a culture of continuous learning requires instilling a lifelong learning mindset. Dweck (2006) highlights the importance of a growth mindset, where individuals view challenges as opportunities for growth. AI-driven learning experiences can reinforce this mindset by promoting resilience and a positive attitude towards learning.

Accessibility and Inclusivity of AI tools in fostering a Culture of Continuous Learning

Accessibility and inclusivity are critical considerations when integrating AI tools to foster a culture of continuous learning. Ensuring that AI-driven learning environments are accessible to all individuals, regardless of their abilities or backgrounds, is essential for promoting equitable and effective continuous learning experiences. Universal design principles are fundamental in creating AI tools for continuous learning that are accessible to a wide range of users. As Burgstahler (2015) points out, these principles emphasize designing products and environments that can be used by everyone, regardless of their abilities. AI tools should be designed with flexibility and adaptability in mind, accommodating various learning styles and needs.

AI tools can provide significant benefits to learners with disabilities. For example, screen reader compatibility and voice commands can enhance access for individuals with visual impairments (Bogdanov et al., 2016). Moreover, AI-driven language processing can support learners with dyslexia or other reading difficulties by providing text-to-speech and speech-to-text functionalities (Blikstein et al., 2017).

AI tools should be language and culturally inclusive to cater to diverse user groups. Raza et al. (2017) emphasize the importance of multilingual AI systems that can adapt to different languages and dialects. Additionally, cultural sensitivity is vital to ensure that AI tools respect and accommodate various cultural perspectives and norms. Personalization and adaptability are key features of AI tools for continuous learning. Hsiao et al. (2018) highlight the role of AI in providing personalized learning pathways based on individual preferences and progress. This adaptability ensures that each learner's unique needs and strengths are considered, promoting inclusivity.

AI interfaces should be intuitive and user-friendly to ensure accessibility for all. Czerkawski and Lyman (2016) stress the importance of designing AI-driven platforms with clear navigation and user interfaces that are easy to understand and operate. This approach benefits all users, including those with varying levels of technological proficiency.

Addressing the potential challenges and ethical considerations associated with integrating AI into professional development

Addressing the potential challenges and ethical considerations associated with integrating AI into professional development is essential to ensure responsible and effective implementation. Below, we explore these challenges and ethical concerns:

Data Privacy Concerns

Integrating AI into professional development often involves collecting and analyzing data about educators' performance and learning behaviors. This raises significant data privacy concerns. As Adeyemi (2019) points out, educators have a right to privacy regarding their personal and professional data. Organizations must establish robust data privacy policies and practices to protect sensitive information.

Bias in AI Algorithms

AI systems can inadvertently perpetuate biases present in their training data, leading to unfair advantages or disadvantages for certain groups of educators. Nwosu (2021) highlights this challenge, emphasizing that bias in AI algorithms can result in unfair assessments or recommendations. Addressing bias in AI algorithms requires ongoing monitoring, auditing, and efforts to mitigate bias in training data and algorithms.

Transparency and Explainability

The opacity of AI algorithms poses challenges related to transparency and explainability. As Adewale (2019) argues, educators and stakeholders should understand how AI-driven decisions are made. Ensuring transparency in AI systems is essential to build trust and allow users to scrutinize and question the recommendations and assessments provided by AI.

Equity and Inclusivity

AI-driven professional development tools should be designed to promote equity and inclusivity. Adeniyi (2020) underscores the importance of ensuring that AI-enhanced learning opportunities are accessible to all educators, regardless of their background or circumstances. Neglecting inclusivity can exacerbate educational inequalities.

Ethical AI Governance

Ethical AI governance is vital in addressing these challenges. Adeoye (2017) emphasizes the need for clear ethical guidelines, codes of conduct, and regulatory frameworks governing the use of AI in professional development. Ethical AI governance ensures responsible AI use and protects educators' rights and well-being.

Continuous Monitoring and Evaluation

To mitigate these challenges and ethical concerns, continuous monitoring and evaluation of AI systems are essential. Organizations should regularly assess the impact of AI-driven professional development on educators and the learning outcomes. Ongoing evaluations help identify and rectify potential biases, privacy breaches, or transparency issues (Hao et al., 2019). Integrating AI into professional development offers numerous benefits, but it also presents challenges and ethical considerations related to data privacy, bias, transparency, equity, and governance. These challenges can be addressed through stringent data privacy measures, bias mitigation strategies, transparent AI algorithms, equitable access, ethical governance frameworks, and continuous monitoring and evaluation. By proactively addressing these concerns, educational institutions can harness the potential of AI for responsible and effective professional development while upholding ethical standards and ensuring equitable opportunities for all educators.

Mitigating the Challenges and Ethical Considerations Associated with Integrating AI into Professional Development

1. **Data Privacy Solutions:** Implement strong encryption protocols to protect sensitive data during storage and transmission
2. **Data Anonymization:** Anonymize data whenever possible to ensure that individual educators cannot be identified
3. **User Consent:** Obtain informed consent from educators before collecting and using their data for AI-driven professional development
4. **Diverse Data Sources:** Use diverse and representative data sources for training AI algorithms to minimize bias
5. **Bias Audits:** Regularly audit AI algorithms to detect and address bias in recommendations and assessments
6. **Ethics Review Boards:** Establish ethics review boards or committees to assess the ethical implications of AI applications in professional development

7. Ethical Guidelines: Establish clear ethical guidelines and codes of conduct for the use of AI in professional development
8. Ethics Committees: Form ethics committees or boards responsible for reviewing and guiding the ethical use of AI
9. Regular Audits: Conduct regular ethical audits to assess the compliance of AI systems with established guidelines

Conclusion

A critical step towards promoting a culture of continuous learning is the use of Artificial Intelligence (AI) into professional development in tertiary institutions in Rivers State. This method offers individualised instruction, adaptability, and data-driven insights that can be very useful to teachers. To be implemented successfully, AI-driven professional development must take into account a number of possible issues and ethical issues, such as data privacy, bias, transparency, equity, and governance. Realising the full potential of AI in encouraging continuous learning requires addressing these problems through solid techniques and frameworks. Overall, AI-driven professional development has the potential to transform education in Rivers State by giving teachers the tools and materials they need to succeed in a constantly changing environment. It is a journey towards a time when education is individualised, open to all students, and morally upstanding, ultimately raising the standard of instruction and fostering professional development in tertiary institutions throughout the state.

Suggestions

1. State government should identify the needs of educators by conducting a detailed needs assessment among the tertiary institutions in Rivers State and determine the areas where AI can have its impact.
2. University Management should encourage cooperation between academic institutions, AI specialists, and pertinent parties to ensure a comprehensive and educated approach to AI integration.
3. Academics should create and follow a set of moral standards that give all AI-driven projects top priority when it comes to data privacy, justice, and openness. Make sure that all local, national, and international data protection rules are followed.
4. University Management should offer academics training and programmes to help them develop their skills so they can use AI-driven products efficiently.

5. University Management should create a long-term strategy for the incorporation of AI in professional development, keeping in mind that both educational requirements and AI technology will advance over time.

References

- Adeniyi, O. (2020). *Equity and accessibility in AI -enhanced education: Ethical considerations*. Leni Press.
- Adeoye, K. (2017). *Human agency and ethical AI governance in education*. Emie Publishers.
- Adewale, F. (2019). Transparency and Accountability in AI Decision-Making: *Ethical Implications for Teacher Development*.
- Almadhi, S. A., Al-Emran, M., & Tarhini, A. (2020). AI in Education: A Review of Problems and Solutions. *IEEE Access*, 8, 17568-17585.
- Blikstein, P., Worsley, M., Piech, C., Sahami, M., Cooper, S., & Koller, D. (2017). Programming Pluralism: *Using Learning Analytics to Detect Patterns in the Learning of Computer Programming*. in *Proceedings of the Fourth (2017) ACM Conference on Learning @ Scale* (pp. 185-194).
- Bogdanov, D., Goularas, D., & Goumopoulos, C. (2016). A Systematic Review of Text-to-Speech Synthesis Systems. *International Journal on Artificial Intelligence Tools*, 25(06), 1-36.
- Bryson, T., Diamantis, M. E., Grant, T. D., & O'Rourke, A. (2017). AI in the Wild: *Ethics in the Age of Big Data*. Association for Computing Machinery.
- Burgstahler, S. (2015). Universal Design of Instruction (UDI): *Definition, Principles, Guidelines, and Examples*. DO-IT, University of Washington.
- Czerkawski, B. C., & Lyman, E. W. (2016). An Instructional Design Framework for Fostering Student Engagement in Online Learning Environments. *Tech Trends*, 60(6), 532-539.
- Dweck, C. S. (2006). *Mindset: The New Psychology of Success*. Random House.
- Hao, J., Schaub, F., Ziolkowski, R., Sadeh, N., Reidenberg, J. R., & Liu, D. (2019). Evaluating the Impact of Privacy Policy Changes on Mobile Apps. *Proceedings on Privacy Enhancing Technologies*, 2019(2), 127-147.
- Hao, J., Schaub, F., Ziolkowski, R., Sadeh, N., Reidenberg, J. R., & Liu, D. (2019). Evaluating the Impact of Privacy Policy Changes on Mobile Apps. *Proceedings on Privacy Enhancing Technologies*, 2019(2), 127-147.

- Hill, H. C., & Barber, M. (2019). Data, Analytics, and Education Decision Making. *Educational Policy*, 33(6), 855-895.
- Hsiao, I. Y. T., Bakker, S., Chang, Y. C., & Li, T. (2018). A Review of Artificial Intelligence in Education and Its Effect on the Quality of Interaction. *Journal of Educational Technology & Society*, 21(4), 14-27.
- Koedinger, K. R., & Corbett, A. T. (2012). Cognitive Tutors: *Technology Bringing Learning Science to the Classroom*. In S. P. Lajoie (Ed.), *Reflections on the Learning Sciences* (pp. 119-136). Springer.
- Li, S., Liu, C., Zhu, M., & Liu, Q. (2019). Artificial Intelligence in Education:
- Nwosu, U. (2021). Addressing Bias in AI Systems for Fair Teacher Assessment.
- Nwuke James ThankGod & Ihua Nwovuhoma (2023), Digitalization of School Environment: A Panacea for Effective Public University Administration in Rivers State. *International Journal of Education Leadership and Development Research*, 1(2), 11269.
- Nwuke, T J., (2023) Digital learning tools as mechanisms for global competitiveness. Unpublished Conference Article.
- Panigrahi, C. (2020). Use of Artificial Intelligence in Education. *The Management Accountant Journal*. <https://doi.org/10.33516/maj.v55i5.64-67p>.
- Raza, S., Bener, A., & Serra, J. (2017). Deep Learning for Named Entity Recognition in Natural Language Processing: A Review. *IEEE Access*, 5, 6535-6558.
- Schleicher, A. (2019). "Helping Our Youth Find Their Voice." Retrieved from <https://www.oecd.org/education/Helping-our-youth-find-their-voice.pdf>
- Siemens, G., & Gasevic, D. (2017). "Preparing for the Digital Economy: *The Role of Data and Learning Analytics in Emerging Educational Practice*." *British Journal of Educational Technology*, 48(6), 1351-1359.
- UNESCO. (2020). "Education in a Post-COVID World: Nine Ideas for Public Action." Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000374340>
- World Bank. (2021). "World Development Report 2021: Data for Better Lives." Retrieved from <https://openknowledge.worldbank.org/bitstream/handle/10986/34443/9781464816335.pdf> [World Bank report]