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Developing an Ethical Framework for the Deployment of an Artificial Intelligence–Driven Learning System in Nigerian Universities

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Abstract **Original Research Article**

The integration of AI-driven learning systems into educational systems is rapidly transforming educational landscape globally and Nigerian educational system is not exempted. AI-driven learning systems offer personalized learning, enhancing administrative tasks, and automated assessment among others. However, the ethical implication of deploying such technologies are underexplored. Thus, this paper examined the ethical implications of AI-driven learning systems in Nigerian universities, a proposed framework. Key issues discussed are data privacy, algorithmic bias, and over-dependency on technology could de-skill educators, diminishing the role of critical thinking and the vital teacher-student mentorship. To address these concerns, the study proposed an ethical framework tailored to the Nigerian context, grounded in principles of fairness, accountability, inclusivity and cultural sensitivity. The study recommended, among others, are National Universities Commissions should establish national guidelines for ethical artificial intelligence use in education, ensuring that innovation aligns with societal values, and managers of universities should prioritize data and invest in digital infrastructure and provide equitable access to ensure the benefits of AI are inclusive. This will ensure that artificial intelligence is responsibly and ethically used in educational settings.

Keywords: Artificial intelligence, AI-driving learning system, ethical implication, framework.

Introduction

Tertiary education is globally recognized as the engine room for national development and growth. It is a factory house where manpower development is built, such as doctors, teachers, policy makers, among others. Interestingly, in the 21st century, the educational system is undergoing a profound transformation driven by artificial intelligence. The century witnessed a paradigm shift in the teaching and learning methodology, moving from the traditional instructive-centred models to a more flexible student-centred and technology-enhanced approach. This digital revolution, accelerated by the COVID-19 pandemic, has made the adoption of Ed-Tech a norm rather than an exception.

Leading universities worldwide are leveraging technologies like artificial intelligence AI to create adaptive learning platforms, providing individual

tutoring, automated feedback, and offering data-driven insights into students' performance (Zawacki-Richter et al. 2019). Artificial intelligence refers to the process of stimulating human intelligence by machines, especially computers. Such as learning, reasoning, and self-correction. In education, AI-driven learning systems encompass a mishmash of tools, including intelligent tutoring systems, which provide personalized instruction, automated assessment and feedback tools, predictive analytics that identify at-risk students, and chatbots that support students in inquiries.

The importance of Artificial Intelligence Driven Learning System AI-DLS, in the management of the educational system cannot be exaggerated. And the Nigerian tertiary educational system, to remain relevant, competitive, attract talent, and produce graduates capable of competing in a globalized marketplace, needs to adopt AL-DLS in every facet of educational systems. In the Nigerian educational system, AI-DLS becomes paramount in the face of multifaceted challenges: massification of tertiary education, limited resources, infrastructural challenges, and an urgent need for personalized learning. Failure to do so risks widening the digital and educational divide between Nigeria and the developed world.

It is imperative to mention that the potential benefits of an AI-driven learning system can help to overcome these chronic challenges. They can offer 24/7 personalized learning support, potentially improving pass rates and student engagement (Selwyn, 2022). Also, by automating administrative tasks, they would free up faculty time for more meaningful research and student interactions. The benefits are enormous; however, the adoption of AI-DLS in tertiary education in Nigeria is unregulated, and this poses a serious ethical risk- bias, privacy erosion, accountability gaps, and fear of job displacement. It is imperative to state that the adoption has created a moral dilemma and policy vacuums that need to be filled. This gap is prominent in the Nigerian educational system due to the critical absence of a contextual, holistic, and actionable ethnic framework to guide the development, deployment, and auditing of AI-DLS. If this gap is not urgently addressed, it will perpetuate the existing digital divide between the Nigerian educational system and the advanced economy.

It is in the realization of this that the researcher seeks to develop an ethical framework for the deployment of an artificial intelligence–driven learning system in the Nigerian educational system. Specifically, the researcher is tasked to: provide a framework for Nigerian universities, provide practical recommendations for implementations, governance, and further research. To achieve this, the researcher will rely on secondary data from literature, journals, textbooks, and other secondary sources of data. Also, to ensure a thorough investigation and analysis of the topic and variables under investigation to uncover their underlying principles and relationships. The scope of the study is limited to Nigerian universities, and the study will contribute to the repository of knowledge on the ethical framework for the use of artificial intelligence.

The study is anchored on Value Sensitive Design VSD, which is a theoretically grounded approach to the design of technology that accounts for human values in a principled and comprehensive manner (Friedman et al., 2017; Sedek et al., 2024). Batya Friedman and Peter Khana developed VSD at the University of Washington from the 1980s to the early 1990s. In 2019, Batya Friedman and David Henry published a book on the topic titled "Value Sensitive Design: Shaping Moral Imagination." The aim of the theory is the integration of ethical values in the use of technology. The theory is apt and relevant to the study, firstly, because it underscores the importance of integrating human values in the design of technology. VSD is widely recognized for creating a more human AI system (Umbrello & Van de Poek, 2021). Secondly, it is specifically designed to provide technology that accounts for human values, provides a concrete methodology for identifying, integrating, and upholding ethical values like privacy, fairness, accountability, and human welfare. It is against this that the paper is structured after the introduction, clarification of related concepts, ethical implication of AI, international and national implication of AI, adoption of AI in Nigeria, challenges of adoption of AI and suggestions.

Artificial Intelligence (AI)

Artificial intelligence is no longer a slogan for the future but a concept that has caused a paradigm shift in every facet of human endeavour, and education is no exception. AI has reimagined the educational landscape, and any institutions or organizations that refuse to integrate it do so at their peril. AI is a subfield of computer science dedicated to creating machines and systems that are capable of performing tasks hitherto reserved for human intelligence (Poole & Mackworth, 2017). AI technologies use data analysis and algorithms to perform tasks historically reserved for human intelligence: mimic human intelligence or use computer-controlled robots to perform tasks commonly associated with human intelligence (Edu & Uwelegbewe, 2025; Russell & Norvig, 2020). Such as the ability to reason, perception, language comprehension, problem-solving, and learn from past experiences, Omodu (2025) posits core components of artificial intelligence as Machine Learning, Neural Network, Natural Language Processing, Computer Vision, and Robotics. So, artificial intelligence is not a single technology but an umbrella encompassing various subfields. In education, AI has various learning platforms that enhance teaching and learning, cause personalized learning, make learning flexible, and meet the needs of various learners. Unlike the one-fits-all teaching model, which is rigid and teacher-centred.

Artificial Intelligence-Driven learning System

An AI-driven learning system is an educational platform or application that leverages technology to enhance the teaching and learning process, such as providing personalized learning and automating the grade system, among others. Interestingly, AI in education is redesigning the concept of schooling and how teachers and students interact. It consists of a powered classroom to smart administration and, in so doing, enhances efficiency, accessibility, and personalized learning. Holmes et al. (2019) posited that an AI-driven system is an educational technology that uses AI algorithms and techniques to support, enhance, and personalize teaching and learning. Unlike single digital learning, the system adapts to learners' needs, provides real-time feedback, predicts learning outcomes, optimizes the teaching process, and automates administrative tasks, such as grading and content delivery.

Types of AI-Driven Learning Systems

	TYPES	FUNCTIONS	EXAMPLES 11
11	Intelligent Tutoring System (ITS)	• Create an artificial intelligence between students and teachers, providing individualized instruction and feedback. • Providing real-time support, answering questions, and guiding learners through difficult subjects	Carnegie learning, MATHIA Socratic by Google Querium
2	Adaptive Learning Platforms	• Use algorithms to tailor learning experiences to individual needs,	DreamBox, Squirrel AI, Smart Sparrow

		adjusting difficulty levels based on performance.	
3	AI-Powered Management Learning Systems	• Automated administrative tasks, provide real-time insights, and offer adaptive learning systems.	Blackboard Analytics
4	Generative AI tools	• Create new content, summaries, safe time, and enhance engagement	MagicSchool AI, ChatGPT-based education tools, and AI tools that generate images and videos
5	Personalized AI Platforms	• Tailor the instructional environment to individual strengths and weaknesses, predicting student patterns and habits.	Knowji AI tool for l Language learners
6	Chatbots and Virtual Assistants	• An AI agent that supports students with FAQs, course guidelines, or language learning	Duolingo's AI-based tutor
7	Automated Assessment and grading systems	• Evaluate essays, quizzes, or coding exercises using NLP and ML techniques. • Automating grading, scoring, and feedback, freeing teachers to focus on teaching and monitoring	Gradescope, Copylinks AI
8	Predictive Analysis Systems	• Monitor student performance and predict risks like dropout or failure	XGBoost
9	Speech and Language Processing Tools	• Support language learning, translation, or accessibility • Speech Recognition System	Voice assistants Siri, Google Assistant, and Alexa. Google Speech recognition, Microsoft Azure

		• Recognize and translate spoken language. • Pronunciation Analysis Tools • language translation tools	Speech Services, and IBM Watson Speech text Speechace and Fluency Checker Google Translate and Microsoft Translator
T		• grammar and spell checkers	Grammarly and Ginger
		• text summarization tools	summarizedBot and Text Compactor
		• language learning pattern	Duolingo, Babbel and Rosetta Stone

It is important to state that the list is not exhaustive; technology keeps evolving, and new AI-driven learning systems keep emerging.

Ethical Implications of the Use of Artificial Intelligence

The use of AI technology in higher education is increasingly becoming a norm, and it presents a useful opportunity in enhancing the attainment of educational goals. The adoption helps in expanding education to the underserved in society, providing flexible learning patterns, and making education learner-centred. AI-driven learning systems significantly enriched teaching, learning, and administrative tasks in universities- providing personalized learning, scalable feedback, research assistance, and administrative efficiency. Despite the laudable benefits of artificial intelligence in educational settings, there are enormous ethical concerns that need to be addressed to maintain educational integrity. They are:

1. **Bias and Fairness**

An AI-driven learning system can exhibit various biases that compromise the integrity of the system and inadvertently affect the marginalized group. These biases can be as a result of data collection, algorithmic design, and user interactions, which can lead to discriminatory outcomes in educational contexts and beyond. Algorithm bias inadvertently favour specific groups due to design or training process, perpetuating inequalities (Pulvarithy & Whing 2020). In the same vein, Chinata et al. (2020) opined that inaccurate or unauthorized data can lead to skewed AI outcomes, disproportionately affecting certain demographics, or the user interaction with AI can also introduce biases, impacting the effectiveness of educational tools. For instance, if AI-trained data are trained mainly from English-speaking countries, without support from different languages or cultural backgrounds. This may lead to unrelated context suggestions, unfair judgment, or excluding people from opportunities. This is extremely serious because bias can breed harmful stereotypes, create unequal learning experiences, and make learners lose their trust in the systems. Maphosa (2024), emphasized that AI systems often reflect and perpetuate existing societal biases, leading to discriminatory outcomes against marginalized groups.

2. **Data Privacy**

One of the major advantages of information technology is extensive data collection and massive processing of information at a supersonic speed.

Thus, an artificial intelligence learning system can extensively collect large amounts of data, and sensitive information such as test scores, health issues, and personal information can be exposed through inadequate security measures. This can lead to privacy violations, unfair treatment of students' records, and undermine the trust, quality, and integrity of the learning environment. (Ismail & Ahmad 2024).

3. **Transparency**

Many artificial intelligence systems, especially those using deep learning, often operate as 'black boxes', making it difficult to understand how they reach decisions. Black Box means that decision-making processes are not transparent or easily explainable. Algorithmic opacity can compromise transparency by bias and errors in decision-making processes, thereby leading to challenges in how decisions are made. For instance, if AI makes an error in students' grading, it is difficult to determine who is accountable-the teacher, developer, or the institution (Selwyn 2019). This lack of interpretability can undermine trust in educational settings.

4. **Delegation of Educational Authority**.

Another ethical concern is the delegation of educational authority by conceding hitherto decision-making to artificial intelligence. This delegation blurs lines of responsibility, shifting decision-making power away from teachers and learners, creating tension over who is autonomous, who is responsible and how decisions are audited (Jantasuriyarats 2022). If a student receives poor instruction or inappropriate feedback from artificial intelligence. Who shall be held responsible? (Williamson & Eymon, 2020). This raises issues of ethical concern about loss of human oversight, reduction of educator and learner autonomy.

5. **Loss of Job**

There is a palpable fear that the continuous integration of artificial intelligence into educational settings will replace teachers and administrative staff, especially in repetitive administrative work. Undoubtedly, AI can enhance the learning experience and efficiency; however, it poses a risk to employment stability for educators and administrative staff. AI technology, such as adaptive learning platforms and automated grading, can perform tasks traditionally handled by educators, potentially leading to job displacement (Yambal & Waykar, 2025; Faroiq et al, 2024).

6. **Over-dependence on Technology**

Overreliance on artificial intelligence-driven systems can lead to a decline in critical thinking and problem-solving skills. Other issues are related to equity and privacy. Pandya & Rajinkant (2025) opined that AI technologies may intensify existing inequalities in educational access, particularly for marginalized groups, as urban support reported higher dependence and ethical concern regarding AI use. They argued that over-reliance on AI can diminish the importance of human interactions and critical skills, as students may become too dependent on AI for problem-solving.

7. **Intellectual Property**

AI systems often rely on large datasets for training models and, in some instances, use course materials, textbooks and online materials without proper licensing and consent. Thus, the AI-generated content raises questions about ownership and authorship, potentially challenging the traditional notion of intellectual property. Nkai (2025) opined that training an AI system on a large amount of data also raises copyright concerns, particularly when the data includes protected works used without authorization.

8. **Plagiarism and Academic Integrity**.

Artificial intelligence systems can produce essays, assignments and projects by mimicking human intelligence, making it difficult to distinguish between original work and the one generated by AI, thereby raising plagiarism concerns. Studies have shown that there is a correlation with a higher rate of plagiarism among students who frequently use these tools without adequate understanding of academic integrity. Asim et al (2024) opined that AI tools such as ChatGPT can generate content that may lead to

unintentional plagiarism, as students may rely heavily on these systems for writing assignments

It is unequivocal that the adoption of AI-driven learning systems has enhanced learning experiences and efficiency of teaching and learning, but not without ethical issues like algorithmic bias and discrimination, opacity and transparency, and over-dependency on AI, among others. This is primarily due to an insufficient or pragmatic framework to guide the use of artificial intelligence. It therefore behoves the researcher to provide a framework that suits the Nigerian educational system. It becomes instructive to look at other intergovernmental, national and state artificial intelligence frameworks to better understand the ethical issues associated with AI-driven learning systems.

International and National Framework on Artificial Intelligence

The importance of artificial intelligence in everyday activities cannot be overemphasised, especially in the area of individualized instruction, automated administrative tasks, among others. These laudable roles have made the adoption of educational technology, especially AI as inevitable for the performance of administrative tasks in the digital world. Despite the potential of enhancing the learning experiences, there are ethical issues that have created a moral dilemma and policy vacuum that intergovernmental and national government tends to fill to ensure that AI is used responsibly and ethically.

One of the most widely published artificial intelligence ACTs, widely published is the European Union ACT known as the EU AI ACT Regulation. Published in the EU's official journal on 12th July 2024. The use of artificial intelligence in the EU is regulated by the AI ACT. The aim is to ensure AI systems are safe, trustworthy, and respect the fundamental human rights, fostering innovation and a single AI market. The European Union's AI ACT place significant emphasis on safeguarding individuals' rights, prioritizing transparency and human oversight (European Parliamentary 2023).

In 2021, UNESCO adopted the recommendation on the Ethics of Artificial Intelligence. The recommendation on the ethics of artificial intelligence sets out common values and principles to assist in the creation of the legal infrastructure required to ensure the healthy development of AI (Helsinki Times, 2021). Others are protecting data, banning social scoring and mass surveillance, helping to monitor and evaluate, and protecting the environment.

In 2019, the American government established the 'American AI Initiative' to begin work on federal engagement of AI standards. In January 2020, the United States, under the Trump Administration, issued 'Guidance for the Regulation of AI Applications. The emphasis was on the need to invest in AI technology to boost public trust in artificial intelligence, reduce barriers for usage and keep American AI technology competitive in a global market. To Americans, AI governance is more centralized with a focus on promoting innovation and maintaining global technological leadership. Unlike the American framework, China's AI policy framework is characterized by its focus on state security, social harmony, and the integration of AI into national economy strategies (Roberts et al., 2021). The framework aligns with China's broader government control of technology, where the state plays a central role in guiding the development of AI.

The various national and international frameworks have highlighted the challenges of creating a universal standard for artificial intelligence. So, it becomes imperative that Nigerian educators provide a framework that will mitigate ethical concerns about the use of AI in educational settings.

Adoption of Artificial Intelligence Framework in Nigeria

National Educational Policy (2014) recognized education as an instrument for national development; thus, efforts are made to ensure that Nigerian educational institutions are digitally compliant in teaching and learning. Various policies support ICT at all levels of the Nigerian educational system, and it is the responsibility of the government to provide facilities and necessary infrastructure for the promotion of ICT and its use as a learning tool for all levels of education (Asodike, 2015). Also, the

Nigerian government recognizes artificial intelligence as a pivotal force for its future socio-economic development, global competitiveness, and national growth. To achieve this, the federal government initiated various policies and institutions to harness the potential of AI for socio-economic development.

1. **National Artificial Intelligence Strategy** (NAIS).

The federal government, through a multi-stakeholder engagement involving the NITDA and the Ministry of Communication, has initiated a comprehensive process to develop and harness AI's transformative capacity to address pressing socio-economic challenges and accelerate economic growth. Their greatest point is that the consultation with academia, industry, civil society, and international partners is crucial for creating a strategy that will be holistic and widely accepted.

2. **3 Million Technical Talent**

This is an initiative by the Federal Ministry of Communication and Digital Economy to train and equip young Nigerians with digital skills to build a strong technical workforce for the country's digital economy. The aim is to provide Nigerian youth with skills such as AI, Cloud computing, and data science, focusing on practical, hands-on learning and connecting talent with job opportunities to position Nigeria as a global tech leader.

3. **The National Centre for Artificial Intelligence and Robotics (NCAIR)**

The NCAIR is managed by the National Information Technology Development Agency and serves as a research center as well as a hub for development and innovation. It promotes capacity building by bringing together students, developers, and researchers for regular training sessions aimed at solving local problems through artificial intelligence. It is also imperative to state that various universities and higher education institutions have integrated AI literacy programs into their curricula to equip students to understand AI applications and ethical considerations.

Challenges to the Adoption of Artificial Intelligence in Nigeria

Despite these laudable programs and policies, the Nigerian AI's journey faces systemic challenges, some of the notable ones are:

Inadequate Infrastructure

Despite various policies encouraging the integration of technology in the educational setting, the foundational infrastructure for AI in educational institutions is very weak. These include unreliable and expensive networks, higher data costs, and inconsistent connectivity, hindering access to cloud-based AI tools and larger-scale online learning. Wordu (2024) opined that some tertiary education institutions in Nigeria operate with obsolete or inadequate educational facilities, and a lack of digital facilities has worsened effective teaching and learning. Data scarcity hinders the integration of AI technologies, impacting both students and educators, while data fragmentation exacerbates educational disparities, particularly between the urban and rural institutions, limiting the equitable use of AI tools (Mathew & Isaac, 2025). Closely related to inadequate infrastructure are data silos. Government agencies and private companies hold data in silos, lacking a robust framework for secure data sharing in the public interest.

Additionally, public universities in Nigeria lack sufficient computers, poor bandwidth and unreliable internet access and cloud resources, which hinder model training and large-scale experiments. These challenges stem from infrastructural deficits, limited connectivity, and insufficient funding, which hinder effective integration of AI technologies into the educational system (Touitou, 2017; Oyeleye et al. 2014).

Funding and Sustainability

The government is the major financer of public universities in Nigeria, and the universities hardly have enough money for the research and development of AI technologies. Universities' dependence on government funding has posed a challenge to the development of AI technologies.

The chronic underfunding of public universities in Nigeria has led to structural shortfalls for higher education capital and research spending (Anazodo & Ezenwegbu, 2025). Inadequate funds for higher education have led to inadequate infrastructures, and this has posed a ripple effect on every aspect of teaching, learning and research (Wordu & John, 2025; Wordu & Wodi, 2024). Public universities lack the necessary infrastructures, such as reliable bandwidth, modern labs, and institutional support for data and experimentation. This stops faculty and students from doing reproducible artificial intelligence work and undermines learning outcomes. It becomes difficult to build modern infrastructures, pay competitive salaries and run research programs.

Furthermore, AI systems require maintenance, upgrading of facilities, stable internet, cooling for hardware, and trained staff for upkeep and sustainability. Adeleke et al. (2024) opined that many universities experience frequent disruption in internet services, which affects online learning and AI applications that rely on a stable connection. Budgetary limitations and the high cost of Ed-tech associated with acquiring and maintaining AI technologies deter universities from investing in these systems (Suleman 2024; Obidibeube et al. 2025).

High Cost of Infrastructure, Hardware and Software.

Artificial intelligence requires computing power, high bandwidth internet, data storage and reliable electricity, among others. And these facilities are very expensive to acquire, install and maintain. Many universities lack modern laboratories, high-performance servers, and modern IT systems, and these limit the ability to implement AI-driven solutions effectively (Alaba et al.2025). These challenges are compounded by inadequate funding, limited internet connectivity and a lack of skilled personnel, which collectively create barriers for effective integration of AI technologies in educational settings.

Lack of Skilled Personnel and Brain Drain

Skilled people are the single most critical resource for AI; Nigerian public universities face both underinvestment in capacity building and outward migration of talent, reducing available expertise for teaching and research. The emigration of skilled professionals reduced the capacity for mentorship and knowledge transfer in Nigerian universities (Okoro et al., 2014). Universities often struggle to recruit or retain faculty and technical staff with up-to-date expertise in artificial intelligence and its mathematical foundations. Unattractive working conditions and poor research support conditions as key barriers to AI research development in Nigerian universities.

Data Scarcity and Fragmentation

Despite the benefits of educational technology in enhancing teaching, learning and research. There is a scarcity of large, clean, and automated datasets relevant to the Nigerian context, such as local languages, agricultural data, among others. Data scarcity and fragmentation stem from inadequate data collection practices, poor data quality, and technological infrastructure, which impede the effective use of machine learning and technologies in educational settings. Quinn (2023) opined that Nigerian universities often lack the comprehensive datasets necessary for training AI models, resulting in unbalanced representations and ineffective learning outcomes. The absence of standardized data connection procedures results in incomplete and invalid data, further complicating AI integration (Artiaga and Flores 2024). Similarly, fragmented data sources can result in low-quality datasets, which negatively impact the development of AI systems.

Guiding Principles for the Formation of an Artificial Intelligence Framework

Artificial intelligence is no longer a buzzword for the future but an inevitable change that all must respond to for daily usage. To avoid widening technological and developmental gaps, there is a need to adopt AI and domesticate it to serve our national needs, reflect our ethical values and overcome economic

challenges. Below are some of the core principles for guiding the formation of an AI framework:

Principle of Contextual Relevance and Local Problem Solving

The Nigerian framework on artificial intelligence should emphasise the need for AI solutions to resonate with local needs, cultural context, and infrastructural reality. This is in line with the African Union's Digital Transformative Strategy for Africa (2020-2030), emphasizes the need for homegrown digital solutions to address continental challenges. Dumbuye (2025) emphasized the need to incorporate the indigenous knowledge system, promoting an Afrocentric approach that respects local cultural identities. It becomes imperative to create local language processing, creating NLP models for Nigerian languages to bridge the divide. AI technologies should align with educational programs with local industry needs, fostering skills that are directly applicable in the Nigerian market (Abdullahi et al 2025).

Principles of Ethical, Responsible and Inclusive Education

These principles are crucial in the development of an AI framework for several reasons- to ensure that AI technologies are integrated in a manner that promotes equity, transparency, and accessibility for all students, especially those with diverse needs. An AI system must be prioritize the protection of student data to prevent breaches and misuse. Address AI algorithms to avoid reinforcing existing educational disparities and clear communication about AI decision-making processes to foster trust among stakeholders (Farooqi, 2025).

It is imperative to state that ethical considerations such as transparency, informed student consent, and fairness are essential to mitigate risks associated with AI, including algorithm biases and privacy violations. If these are integrated into the institutional framework can enhance the culture of data privacy and trust among stakeholders. So, institutions must clearly communicate how student data is collected, used and protected, ensuring stakeholders understand the implications of AI technologies (Balaji, 2025). In the same vein, Torri-Steele (2025) opined that students should be adequately informed about data usage and have the right to consent, which is vital for ethical data handling. Furthermore, AI should be designed to avoid biases that could disadvantage certain student groups, promoting equitable access to educational resources (Ndiovu & Maguraushe, 2025).

Principles of Collaborative Partnership

This principle of collaborative partnership plays a crucial role in building AI capabilities within Nigerian universities. The collaboration will help Nigerian universities to build robust, practical AI education, fostering and enhancing resource sharing, innovation that aligns with national goals. Akinnuwesi et al. (2020) opined that a collaborative framework is essential for national knowledge building, as it allows universities to pull resources and share research findings, thus improving overall educational quality. Also, imperative to state that collaborative partnerships connect Nigerian universities with tech companies and government bodies to co-develop AI projects and programs. It underscores the importance of Public-Private Partnership PPP, which, if well-harvested, will foster interdisciplinary collaboration and integrate AI technologies into the educational framework.

Conclusion

The advent of the 4th industrial revolution has led higher educational institutions to leverage technologies, especially artificial intelligence, to create various learning platforms, like an adaptive learning platform. Providing individuals with tutoring, automotive feedback, and offering data-driven insights into students' performance. AI has the potential to revolutionize higher education in Nigeria. However, its deployment must be ethically grounded to ensure just and equitable outcomes. Without proper oversight, AI systems may entrench bias, violate privacy and marginalized the vulnerable groups. To address the pitfalls, the proposed framework should be tailored to the Nigerian context, grounded in the principles of accountability, inclusiveness, cultural sensitivity, robust data protection policy and AI literacy to all stakeholders.

Therefore, without a protective ethical framework, the adoption of AI in Nigerian higher education risks undermining equity, academic integrity, and human-centric values of education.

Suggestions

Universities should adopt the proposed guiding principles for an ethical framework to guide the development, deployment, and evaluation of AI-driven learning tools. Others are:

1. Regulatory bodies such as the National Universities Commission should establish national guidelines on the use of artificial intelligence in education, ensuring that innovation aligns with societal values.
2. Higher educational institutions should prioritize data and invest in digital infrastructure and provide adequate access to ensure the benefits of AI are inclusive.
3. Managers of higher education should have a mandatory algorithmic audit and use diverse local relevant datasets to ensure that biases are mitigated.

References

Abdullahi, R. Bawa, K. & Saninu, S. (2025). Artificial intelligence adoption for skill development in Nigeria. A systematic and roadmap for TVET transformation. *International Journal of research and Innovation in Social Science, ix* (viii), 645-657.

Adeleke, A.A., Godwin, S. & Uthman, K.O. (2024). An assessment of the patterns and issues with AI deployment in Universities libraries in Nigeria. https://doi.org/10.57233/fijis.v1i1.01

Akinnuwesi, B. Odumbo, A. & Aribisala, B. (2020). Knowledge grid: An intelligent system for collaboration and knowledge management in Nigerian universities. Data Science Journal 19(1) https://doi.org/10.5334/DSP-2020.002

Alaba, J.S Almed, S. Farida, A.P. & Oluwatosin, O.V. (2025). Adoption of AI-driven fraud detection system in the Nigerian banking sector: An analysis of cost, compliance, and competency. *Economic Review of Nepal 8*(1), 16-33 https://doi.org/10.316/ern.v8i1.80740

Anazodo, R.O. and Ezenwegbu, C. N. (2025). Artificial intelligence: Application, benefits, and challenges in revolutionizing the public services. https://doi.org/10.35629/5252-0704388399

Arce, M. C. Gavilanes, J.C. Arce, E.M. Haro, E.M. & Jurado, D.B. (2025). Artificial intelligence in Ecuadorian Higher education: Dependence, attitudes, and implications for technology-enhanced sustainable learning. https://doi.org/10.209444preprint202507./393.v1

Artiage, R.T.B & Flores, N.M. (2024). Addressing data availability and quality issues in LGU educational systems for effective learning integration. https://doi.org/10.62241/nano-npt.vi2772.20

Balaji, C.G. Rajesjwari, G. Jain, H. Menaka, S & Shukla, S. (2025). Understanding data privacy and ethical considerations in learning analytics, 579-606.https://doi.org/10.4018/978-8-3693-7-ch034

Dumbuye, E. (2025).Decolonizing African curricula through AI-enhanced pedagogy: Reclaming indigenous knowledge and future skills in postcolonial educational systems. https://doi.org/10.20944/preprinnt202507.0373.vi

Edu, N. and Uwelegbewa, P. E. (2025).School administration and artificial intelligence towards community sustainable development in Nigeria. *International Journal of Educational Management, Rivers State 1*(1), 234-246

European Parliament (2023). A ACT: A set closer to the first rules on artificial intelligence. (NEWs). European Pariement. https://www.enroparl.europa.eu/news/en/press/20230505051pR84904/ai-act-a-step-closer-to-the-firest-rules-on-artificial-intelligence

Farooqi, S.A. (2025). Ethical framework for AI education> Advances in computational intelligence and robotics book series, 153-188.https://doi.org/10.4018/979-8-3373-5550-4.ch007

Farooq, U. Malik, S.& Syed, A.S. (2024). Revolutionizing higher education: The transformative impact of artificial intelligence on teaching, learning and career preparation. Shodhkosh *Journal of Visual and Performing Arts, 5*(3). https://doi.org/10.29121/shodhkash.v5.13.2024.3239

Floridi, L. & Cowls, J. (2019). A unified framework of five principles for AI in society. *Harvard Data Science Review 1*(1)

Friedman, B. and Handry, D.G. (2019). Value Sensitive Design: Reshaping Technology with Moral Imagination. researchgate.net/publicationDoi: 10.7551/mitpress/9780262351690

Helsinki Times (2021/11/26)

Holmes, W. Bialik, M. & Fadel, C (2019). *Artificial Intelligence in Education*: *Promises and Implication in Teaching and Learning*, Centre for Curriculum Redesign

Jontasuriyarat, C. (2022). *Artificial intelligence in education and ethnics'*. Hand book of open, distance and digital education. doi.10.1007/979-981-19-0351-9-6-2

Maphosa, V. (2024). The rise of artificial intelligence and emerging ethical and social concerns. AI computer Science and Robotics Technology 3. https://doi.org/10.5772/gcrt20240020

Nkai, K. (2025). AI-generated content and IP rights: challenges and policy consideration. diplomacy.edu/blog

Ndiovu, B. & Maguraushe, K. (2025). Balancing ethics and privacy in the use of artificial intelligence in institutions of higher learning>: A framework for responsive AI system. Indonesian Journal of Informative Education, 9(1), https://doi.org/10.20961/ijie.v9i1.100723

Obodiebebe, J.I. Ikwelle, A.C. Iwuagwu, B.O. Okwuba, J.I. & Ikana, E.S. (2025). prospects and challenges of AI integration into Nigerian educational Systems. https;//doi.org/1070382/cais/ser.v718.017

Okoro, C.C. Omeluzor, S.U. & amidele, I.A. (2014). Effect of rain drain (human capital) of librarians of service delivery in some selected Nigerian Universities. SAGH OPEN, 4(3), https://doi.org/10.1177/2158244014541131

Omodu, N.S. (2025).Utilization of artificial intelligence in staff mentoring and teaching effectiveness in public universities in Rivers State, Nigeria. *International Journal of Educational management, Rivers State 1*(1), 142-160.

Oyeleye, C.A., Fagbola, T.M. & Daramola, Y.C. (2014). The impact and challenges of cloud computing adoption on public universities in Southwestern Nigeria. *International Journal of Advanced Computer-Science and Application. 8*(5), https;//doi.org/10.14569/IJACSA.2014.050803

Pandya, V.K. & Pandya, R. (2025). The impact of AI on the learning habits of HEI students. International Journal of Current Science Research & Review, 8(7). https://doi.org/10.47191/ijcrsrr/v8-i7-44

Poole, D.L. & Mackworth, A.K. (2017). Artificial intelligence: Foundation of Computational Agent (2nd edition), Cambridge University Press

Quinn, J.P. (2023). Adapting machine learning techniques for low-resource settings in developing countries. A Multi-Disciplinary Approach. https://doi.org/10.31219/osf.i1/62rbp

Roberts, H. Cowels, J. Morley, J. Taddea, M. Wang, V. Floridi, L (2021). The Chinase approach to artificial intelligence. An analysis of policy, ethics, and regulation. AI & Society 36(1), 59-77. doi./10.1007/s00146-202-00992-2

Russell, S. Navig, P. (2020). Artificial intelligence: *A Modern Approach, Pearson*. 4th edition

Sedek, M., Constantinides, M. Quercia, D. Mougenot, C. (2024). Guideline for integrating value sensitive design in responsible AI toolkits: proceedings of the 2024 CHI conference on human factors in computing systems 472, 1-20https://doi.org/10:1145/3613904.3642810

Selwyn, N. (2019). *Should robots replace teachers?* AI and the future of education. Polity Press.

Torrisi-Steele, G. (2025). AI and ethics of student data privacy. Advances in computational intelligence

and robotics book series, 53-76https://doi.org/10.4018/979-8-3373-2397-8.ch003

Vibbi, L. (2024). Poor data quality in Sub-Africa and implications on ethical AI development. Springer Nature https://doi.org/10.1007/978-3-031-52962-7_7

Youitou, T.C. (2017). Appraisal of the prospects and challenges of cloud computing d distance learning in the National Open University of Nigeria. https;//doi.org/10.23956/IJARSER.v711.462

Williamson, M Eynon, R. (2020). Historical threads, missing links, and future direction in AI in education. *Learning Media and Technology*, *45*(3).

Wordu, J.A. (2024). Curriculum management system in higher educational institutions: Best practice and challenges. International Journal of Advanced Research in Multidisciplinary Studies, 4(1). 319-326

Wordu, J.A. John, I. (2024). Soft Skills development in higher education: A pathway to graduate employability. *World Journal of Innovation and Modern Technology 8*(4), 129-139.

Wordu, J.A. and Wodi, J.C. (2023). Smart machine and digitalization: Redefining university education in Nigeria for greater productivity. International *Journal of Institutional Leadership, Policy and Management 6*(1), 69-81

Yambel, S. & Waykar, Y.A. (2023). *Future of education using adaptive AI, intelligent systems, and ethical challenges*. Advances in educational technologies and instructional design book series, 171-202

Zawacki-Richter, O. Marin, V.I., Bond, M. & Gouverneur, F. (2018). Systematic review of ICT research on artificial intelligence in where education-where are educators? *International Journal of Education, 16*, (1), 1-12.