

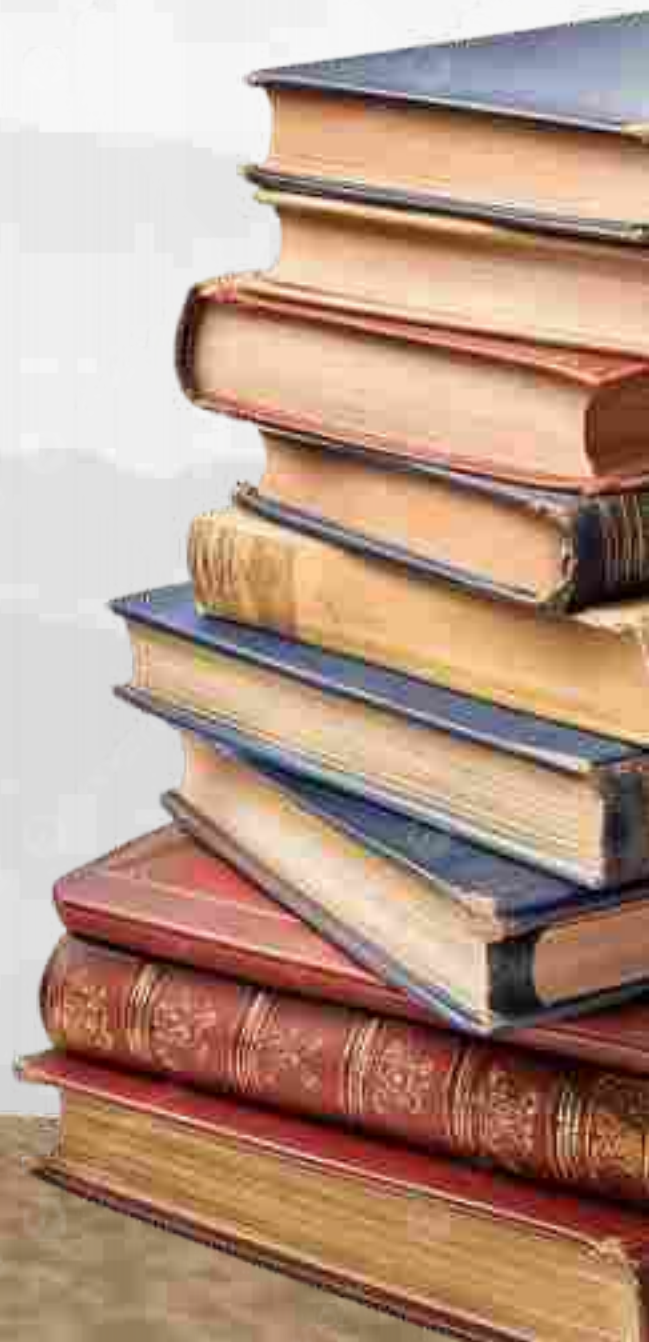


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PERSPECTIVE ON EDUCATION IN NIGERIA

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PERSPECTIVE ON EDUCATION IN NIGERIA

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CHAPTER THIRTEEN

**DEPLOYMENT OF ARTIFICIAL INTELLIGENCES FOR FRAUD
DETECTION AND PREVENTION IN TERTIARY EDUCATION IN
NIGERIA**

By

Victor Olugbenga AyokoDepartment of Educational Foundations, Faculty of Education,
National Open University of Nigeria**Email:** victorayoko@gmail.com**ABSTRACT**

Fraud undermines the credibility and effectiveness of tertiary education in Nigeria, manifesting in examination malpractice, certificate forgery, academic dishonesty, and financial mismanagement. With traditional oversight proving insufficient against complex, evolving fraud schemes, Artificial Intelligence (AI) presents promising tools for detection and prevention. This chapter examines how AI methods—such as plagiarism detection by natural language processing, anomaly detection in financial and academic data, predictive modelling, and biometric authentication—can strengthen academic integrity and transparency among Nigerian universities and colleges. Drawing on recent empirical studies, it outlines both opportunities (automated monitoring, pattern recognition, scalable oversight) and constraints (data quality, technical capacity, cost, ethical considerations like privacy and fairness). The chapter then proposes strategies for effective deployment: invest in data infrastructures; build local AI expertise; adopt ethical governance frameworks; implement hybrid systems combining human oversight and AI; and engage stakeholders in policy and procedure design. If these are well implemented, AI can become a powerful ally in preserving fairness, credibility, and excellence in Nigeria's tertiary education system.

Keywords: artificial intelligence; fraud detection; academic integrity; anomaly detection; Nigeria; predictive analytics; plagiarism

13.1. Introduction

Fraud in tertiary education is a persistent challenge that undermines the credibility, integrity, and effectiveness of Nigeria's higher institutions. Issues such as examination malpractice, falsification of academic records, plagiarism, certificate forgery, and financial mismanagement continue to weaken the quality of education and public trust in the system. Traditional methods of fraud detection, often dependent on manual oversight and administrative processes, have proven inadequate in addressing these sophisticated and evolving threats. This reality has created the urgent need for innovative, technology-driven solutions capable of enhancing transparency and accountability across Nigerian tertiary institutions.

Artificial Intelligence (AI) has emerged globally as a powerful tool for fraud detection and prevention, with applications across diverse sectors such as banking, healthcare, and governance. In the context of tertiary education, AI offers opportunities to automate monitoring systems, analyze large volumes of data, and detect irregular patterns that may indicate fraudulent activities. For instance, AI algorithms can track suspicious academic records, identify cases of plagiarism through advanced similarity checks, monitor examination processes with facial recognition, and enhance the security of financial transactions within institutions. By deploying these intelligent systems, Nigerian tertiary institutions can strengthen their capacity to maintain integrity and promote fairness in academic and administrative practices.

However, the adoption of AI for fraud detection and prevention in Nigeria's tertiary education is not without challenges. Infrastructural deficits, limited technical expertise, high implementation costs, and ethical concerns about data privacy and misuse remain significant obstacles. Despite these hurdles, the potential benefits of AI in safeguarding academic integrity and improving institutional efficiency far outweigh the challenges.

This chapter examines the deployment of Artificial Intelligence for fraud detection and prevention in Nigerian tertiary education. The chapter is discussed under the following subheads: concept of artificial intelligences, concept of fraud, types of fraud, Artificial intelligences tools for fraud detection and prevention, challenges of deploying AI for fraud detection and prevention in tertiary institutions and Strategies to deploy AI for effective fraud detection and prevention in tertiary institution in Nigeria

13.2. Clarification of concepts

i. Concept of Artificial Intelligence

Artificial intelligence refers to computer systems capable of performing tasks that would ordinarily require human intelligence, such as pattern recognition, decision making, and learning from data. Artificial Intelligence refers to the development of computer systems and machines capable of performing tasks that typically require human intelligence (AFSA, 2022; Ogunode & Gregory, 2023). Alagbe (2023) viewed AI as the ability of a computer or machine to mimic the capabilities

of the human mind – learning from examples and experience, recognizing objects, understanding and responding to language, making decisions, solving problems – and combining these and other capabilities to perform functions a human might perform, such as greeting a hotel guest or driving a car. Ogunode & Ukozor (2023) defined AI as programs designed with human-like intelligence and structured in the forms of computers, robots, or other machines to aid in the provision of any kind of service or tasks to improve the social economic and political development of the society. Artificial Intelligence is an application or program constructed to carry out tasks with human-like intelligence.

In general, Laskowski (2022) noted AI systems work by ingesting large amounts of labeled training data, analyzing the data for correlations and patterns, and using these patterns to make predictions about future states. In this way, a chatbot that is fed examples of text can learn to generate lifelike exchanges with people, or an image recognition tool can learn to identify and describe objects in images by reviewing millions of examples. New, rapidly improving generative AI techniques can create realistic text, images, music and other media. These tasks include learning, reasoning, problem-solving, perception and natural language understanding. Artificial Intelligence technologies encompass various techniques and approaches, such as machine learning, deep learning, natural language processing, computer vision and robotics. These technologies enable computers to analyze vast amounts of data, recognize patterns, make predictions and automate complex processes. Artificial Intelligence has applications across numerous fields, including health care, finance, transportation, customer service and education. It has the potential to transform industries, improve efficiency and create new opportunities (AFSA 2022).

AI programming focuses on cognitive skills that include the following:

Learning. This aspect of AI programming focuses on acquiring data and creating rules for how to turn it into actionable information. The rules, which are called algorithms provide computing devices with step-by-step instructions for how to complete a specific task.

Reasoning. This aspect of AI programming focuses on choosing the right algorithm to reach a desired outcome.

Self-correction. This aspect of AI programming is designed to continually fine-tune algorithms and ensure they provide the most accurate results possible.

Creativity. This aspect of AI uses neural networks, rules-based systems, statistical methods and other AI techniques to generate new images, new text, new music and new ideas (Laskowski, 2022).

ii. Concept of Fraud

Fraud is a form of deception or dishonesty in which an individual or organization seeks to gain an unfair advantage over others. This can involve a wide range of activities, from financial schemes to forging documents to misrepresenting information. Fraud is a serious issue that can have significant consequences, both for those who commit it and those who are affected by it. It is important for individuals and organizations to understand what fraud is and how to identify and prevent it. FRAUD, also known as deceptive practices or dishonesty, refers to any intentional act of deception or trickery for personal gain. It can take many different forms, such as identity theft, embezzlement, or false advertising. FRAUD can have serious consequences, not only for the victims but also for the overall trust and integrity of the affected industries or society. As technology advances, so do the methods of FRAUD, making it an ever-evolving and complex issue to combat.

Fraud is a deliberate deception or misrepresentation in order to gain an unfair or unlawful advantage. It can occur in various forms, such as financial fraud, identity fraud, and academic fraud. Financial fraud involves the illegal acquisition of money or assets through deceit or false promises. Identity fraud, on the other hand, is the use of someone else's identity for personal gain. Academic fraud, which is the focus of this tool, refers to any act of dishonesty or deception in an academic setting. It can include plagiarism, fabrication of data, or cheating on exams. Academic fraud is a serious offense that can result in severe consequences, including loss of academic credit, expulsion, or even legal action.

13.3.Types of Fraud in tertiary institutions

Ten fraud in tertiary institutions is an ever-growing concern that needs to be addressed. In the past decade, there has been a significant increase in the number of fraud cases reported in tertiary institutions. This type of fraud not only affects the institutions but also has a negative impact on students, staff, and the overall education system.

One of the main types of fraud in tertiary institutions is financial fraud. This includes embezzlement of funds, misappropriation of funds, and false claims for reimbursement. Financial fraud not only results in financial losses for the institutions but also affects the quality of education and services provided to students.

Another common type of fraud in tertiary institutions is academic fraud. This includes plagiarism, fabrication of data, and falsifying academic records. Academic fraud undermines the integrity of the education system and devalues the degrees and qualifications earned by students. It also creates an unfair advantage for those who engage in such fraudulent activities.

Contract fraud is also prevalent in tertiary institutions. This involves illicit activities such as bid rigging, collusion, and kickbacks in the procurement process. Contract fraud not only results in financial losses but also affects the quality of services and facilities provided by the institution.

Another form of fraud in tertiary institutions is identity theft. This includes the theft of personal information such as student records, financial records, and personal identification numbers. Identity theft can have serious consequences for both the individuals whose information is stolen and the institutions that hold such sensitive information.

Fraud in research and grants is also a growing issue in tertiary institutions. This involves misrepresenting research data, falsifying results, and misusing grant funds. Research fraud not only undermines the credibility of the institution but also has a negative impact on the advancement of knowledge and scientific progress.

Procurement fraud is also a major concern in tertiary institutions. This includes fraudulent activities such as overcharging, false invoices, and bid manipulation. Procurement fraud not only results in financial losses but also affects the quality of goods and services procured by the institution.

In addition to these types of fraud, there are also instances of cyber fraud in tertiary institutions. This includes online identity theft, cyber-attacks, and hacking of institutional networks. Cyber fraud can have serious consequences for both the institutions and the individuals whose information is compromised.

Governance and administrative fraud are also common in tertiary institutions. This includes fraudulent activities such as nepotism, favoritism, and misuse of power and authority. Governance and administrative fraud not only damage the reputation of the institution but also negatively impact the work environment and morale of staff and students.

There has been an increase in student loan fraud in tertiary institutions. This involves fraudulent activities such as falsifying loan applications, using false identities to obtain loans, and misusing loan funds. Student loan fraud not only affects the institution but also has a significant impact on the students who are burdened with debt.

Fraud in tertiary institutions is a serious issue that needs to be addressed. It affects not only the institutions but also has a negative impact on students, staff, and the overall education system. It is important for institutions to have strict policies and procedures in place to prevent and detect fraud and to take appropriate actions when fraud is identified.

13.4. Artificial intelligences tools for fraud detection and prevention

i. Natural language processing (NLP)

First, we discuss the use of natural language processing (NLP) in fraud detection. NLP utilizes algorithms to analyze text data, such as emails or social media posts, to identify suspicious or fraudulent behavior. This tool has been particularly useful in detecting financial fraud, as it can analyze large amounts of text data and identify patterns that may indicate fraudulent activity. (Nwohiri, Joda & Ajayi, 2021).

ii. AI-powered anomaly detection

The use of anomaly detection in fraud prevention. This technique involves identifying abnormal or unusual behavior within a system, which may indicate fraudulent activity. AI-powered anomaly detection can quickly and accurately flag potential fraud, allowing for swift action to be taken. (Nwohiri, Joda & Ajayi, 2021).

iii. Machine learning algorithms

The use of machine learning algorithms in fraud detection and prevention. By training these algorithms on large datasets of known fraudulent and non-fraudulent behavior, they can learn to accurately identify and predict potential fraudulent behavior. This has proven to be a valuable tool in both preventing and detecting fraud in various industries.

iv. AI Data analysis tool

Another AI tool used for fraud detection is predictive analytics. By analyzing historical data, predictive analytics can identify patterns and trends that may indicate future fraudulent activity. This allows for proactive measures to be taken to prevent fraud before it occurs.

v. AI-powered chatbots

The use of AI-powered chatbots in fraud prevention. These chatbots can interact with customers in real-time, detecting and preventing potential fraud during transactions. By utilizing natural language processing and machine learning, these chatbots can quickly and accurately identify fraudulent behavior and stop it in its tracks.

Implement Machine Learning Algorithms: By utilizing machine learning algorithms, AI can be trained to detect patterns and anomalies in financial data, which can help identify potential cases of fraud.

Use Natural Language Processing (NLP): NLP technology can be employed to analyze large amounts of text data, such as emails and documents, to identify keywords and phrases that are commonly associated with fraudulent activities.

Utilize Predictive Modeling: AI can be used to create predictive models that can forecast potential fraud scenarios, helping institutions to proactively prevent fraud before it happens.

Employ Biometric Authentication: Biometric technology, such as voice or facial recognition, can be utilized to verify the identity of individuals involved in financial transactions, reducing the risk of fraud.

Implement Real-Time Monitoring: By constantly monitoring financial data and transactions in real-time, AI can quickly flag suspicious activities and alert institutions to potential fraud.

Utilize Predictive Analytics: By analyzing past fraud cases and patterns, AI can predict and prevent future fraudulent activities, helping institutions to stay ahead of potential threats.

Utilize Pattern Recognition: AI can analyze large amounts of data to identify patterns and correlations, which can help detect unusual or suspicious behavior that may indicate fraud.

Employ Collaborative Filtering: By utilizing collaborative filtering techniques, AI can compare current financial activities to past transactions and patterns, helping to identify any deviations that may indicate fraudulent activities.

13.5.Challenges of deploying AI for fraud detection and prevention in tertiary institutions

The deployment of AI for fraud detection and prevention in tertiary institutions is a complex task that comes with several challenges. Some of the main problems that militate against this deployment include:

i. Poor Funding

One of the foremost challenges is the inadequate financial support for AI projects. Developing and deploying AI-driven fraud detection systems requires huge investment in hardware, software, and skilled manpower. In Nigeria, many public institutions and even private organizations lack the budgetary allocation to sustain such investments. Poor funding leads to reliance on outdated manual methods or inefficient digital tools, making fraud detection less effective.

ii. Inadequate AI Fraud Facilities

AI systems rely heavily on advanced infrastructure such as high-performance servers, cloud computing platforms, cybersecurity firewalls, and reliable power supply. In Nigeria, these facilities are either insufficient or completely lacking in many institutions. The absence of modern laboratories, data centers, and specialized AI platforms hinders the effective deployment of fraud detection systems, leaving institutions vulnerable to fraudulent practices.

iii. Lack of Capacity Building

AI technology is highly dynamic and requires continuous training and retraining of personnel. Unfortunately, Nigeria faces a huge gap in capacity building, as most institutions do not provide adequate training for staff on how to use, maintain, and improve AI systems. Without proper knowledge and skill transfer, the few AI tools available are often underutilized or mismanaged, thereby reducing their effectiveness in detecting fraud.

iv. Lack of Data

Data is the lifeblood of AI. Fraud detection algorithms need access to large volumes of quality and well-structured data to identify patterns and anomalies. In Nigeria, the lack of reliable databases, poor record-keeping practices, and fragmented data systems create a significant obstacle. Limited or incomplete data weakens the accuracy of AI models, making them less capable of predicting or preventing fraudulent activities. In order for AI to effectively detect and prevent fraud, it requires large amounts of data to be trained on. However, in many tertiary institutions, there may not be enough data available for AI to learn from.

v. Lack of Expertise

Nigeria has a shortage of experts in AI development, machine learning, data science, and cybersecurity. Most fraud detection technologies are imported, and local experts with the technical know-how to customize or troubleshoot them are few. This dependence on foreign expertise increases costs and limits the sustainability of fraud detection systems, as local capacity to innovate or adapt is weak. AI technology is still relatively new and requires a certain level of expertise to implement and maintain. Many tertiary institutions may not have the necessary resources or personnel to handle the deployment and maintenance of AI systems.

vi. High Cost of Operation

Deploying AI systems for fraud detection is not only expensive to install but also costly to maintain. Expenses include software licensing, hardware upgrades, cybersecurity measures, and technical training. For many Nigerian institutions, these costs are unsustainable in the long run. As a result, organizations either abandon AI projects halfway or limit their use to partial solutions that cannot effectively combat fraud. Implementing AI for fraud detection and prevention in tertiary institutions can be expensive, as it requires specialized hardware and software. This cost may be a barrier for some institutions, especially smaller ones with limited budgets. The problems of using AI for fraud detection in Nigeria revolve around financial constraints, infrastructural deficits, weak human capacity, data limitations, shortage of experts, and high operational costs.

13.6.Strategies to deploy AI for effective fraud detection and prevention in tertiary institution in Nigeria

There are many strategies that can be employed to improve the existing fraud detection and prevention methods used in Nigerian tertiary institutions. Some of these strategies include;

i. **Implementation of Machine Learning Algorithms:**

One of the key strategies for deploying AI in fraud detection and prevention is the use of machine learning algorithms. This involves training the system with large datasets of past fraudulent activities to enable it to recognize patterns and anomalies in future transactions.

ii. **Use of Natural Language Processing (NLP):**

NLP can be utilized to analyze text-based data such as emails, chatlogs, and social media posts to identify suspicious activities and potential fraud cases.

iii. **Integration of Big Data Analytics:**

With the increasing amount of data being generated, it is crucial to utilize big data analytics to sift through large datasets and identify potential fraud cases that may go unnoticed by manual methods.

iv. **Implementing Biometric Identification:**

Biometric identification methods such as fingerprint and facial recognition can be employed to verify and authenticate individuals during transactions, reducing the risk of fraud.

v. **Incorporating Predictive Analytics:**

The use of predictive analytics can help identify potential fraud cases before they occur, enabling institutions to take proactive measures to prevent them.

vi. **Employing AI-Enabled Fraud Detection Tools:**

AI-enabled fraud detection tools can automate the process of identifying and flagging suspicious activities, reducing the workload for human reviewers.

vii. **Regular Updates and Maintenance:**

To ensure the effectiveness of AI in fraud detection and prevention, it is crucial to regularly update and maintain the system, keeping up with new fraud techniques and patterns. These strategies, when implemented together, can greatly improve the fraud detection and prevention methods in Nigerian tertiary institutions, helping to create a more secure and transparent academic environment for all stakeholders."

Conclusion

The deployment of Artificial Intelligence (AI) for fraud detection and prevention in Nigerian tertiary education represents a critical step toward safeguarding academic integrity and restoring

public confidence in higher institutions. By leveraging AI tools such as facial recognition, plagiarism detection software, predictive analytics, and automated monitoring systems, institutions can significantly reduce the prevalence of examination malpractice, certificate forgery, academic dishonesty, and financial fraud. These technologies offer speed, accuracy, and consistency in detecting irregularities that traditional manual methods often overlook, thereby strengthening transparency and accountability.

Nevertheless, the journey toward full adoption of AI in fraud prevention is not without challenges. Issues such as inadequate infrastructure, limited ICT expertise, unstable power supply, high costs of implementation, and concerns about data privacy remain pressing obstacles. Overcoming these challenges will require deliberate investment in digital infrastructure, capacity building for staff and students, and the establishment of clear policies that promote ethical and responsible use of AI.

In conclusion, while the road to deploying AI in Nigerian tertiary institutions may be demanding, its potential to transform fraud detection and prevention is immense. With the right commitment from government, institutional leaders, and stakeholders, AI can become a powerful ally in promoting fairness, credibility, and excellence within the nation's higher education system.

Revise Questions References

- 1) Define artificial intelligence
- 2) What is fraud?
- 3) List five types of fraud common in tertiary institutions
- 4) Discuss five Artificial intelligences tools for fraud detection and prevention
- 5) Discuss five challenges of deploying AI for fraud detection and prevention
- 6) Highlight five strategies to deploy AI for effective fraud detection and prevention in tertiary institution in Nigeria

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PERSPECTIVE ON EDUCATION IN NIGERIA

CHAPTER ONE:

AN ASSESSMENT OF THE CONTRIBUTIONS OF WEST AFRICA TERTIARY INSTITUTIONS TO THE DEVELOPMENT OF WEST AFRICA COUNTRIES

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CHAPTER TWO:

IMPACT OF RAPID GROWING POPULATION ON THE INFRASTRUCTURE IN NIGERIA

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CHAPTER THREE:

ROLE OF TERTIARY INSTITUTIONS IN FISH PRODUCTION DEVELOPMENT IN NIGERIA

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CHAPTER FOUR:

FACTORS THAT WILL ENHANCE DEVELOPMENT OF CAREER SERVICE CENTRES IN NIGERIAN TERTIARY INSTITUTIONS

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TERTIARY INSTITUTIONS IN NIGERIA AND CRIME MANAGEMENT STRATEGIES

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GAMIFICATION IN SCIENCE EDUCATION IN NIGERIA

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TERTIARY EDUCATION AND ACCREDITATION OF ACADEMIC PROGRAMMES IN NIGERIA

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CHAPTER TWELVE:

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CHAPTER THIRTEEN:

DEPLOYMENT OF ARTIFICIAL INTELLIGENCE FOR FRAUD DETECTION AND PREVENTION IN TERTIARY EDUCATION IN NIGERIA

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CHAPTER FOURTEEN:

DEPLOYMENT OF TECHNOLOGIES IN CURTAILING EXAMINATION MALPRACTICES IN NIGERIA TERTIARY EDUCATION

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