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THE ROLE OF ARTIFICIAL INTELLIGENCE IN CURBING EXAMINATION MALPRACTICE IN NIGERIA EDUCATION SECTOR

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Abstract

Examination malpractice has remained a stubborn and persistent monster that has affected the quality of Nigeria's educational as well as the veracity of grades obtained in the country. The ugly trend has dragged major educational stakeholders into its net; examiners, parents and students are culprits. All efforts made so far to arrest the trend have not yielded the desired result. Therefore, attention is mounting up by the day towards the adoption of artificial intelligence (AI) as a better option. Literature is building up around the potentials of AI as a better option for fighting the menace squarely and decisively. To this end, this study investigated the role of artificial intelligence in curbing examination malpractice in Nigeria Education Sector. Using qualitative review approach, the study reviewed existing relevant literature to properly situate the study. Based on the reviews made, the study concluded that use of AI has the potentials of curing examination misconduct through its proctoring software that can depict any suspicious behavior detected in real time for curbing examination malpractice, most examination bodies in Nigeria still use human proctors even though the technology promises wonders in terms of curbing exam malpractice. Therefore, it was recommended among others that examination bodies and schools should adopt AI-based proctoring while the government should make efforts to provide adequate funds for integrating AI in the education system.
Key words: Artificial intelligence, examination malpractice, proctoring, examination, cheating

INTRODUCTION

A major issue and a recurring decimal affecting the integrity of product of Nigeria Education today is examination malpractice. Students come out with high grades in their senior school certificate examination (SSCE); with alpha (A), beta (B) and credit (C) but which hardly reflect in quality knowledge and translatable skills/competences due to cheating in examinations. A common trend today is seek for centers where students can take their papers without maximum supervisions while some schools would go as far as bribing invigilators and hiring machineries in order to get good results for better patronage. Some parents promote impersonation and bribing of teachers just for their wards to obtain unmerited high grades. That is how bad it has become. In whichever guise it comes, examination malpractice or misconduct defines any attempt, successful or otherwise, to obtain a grade not based on truthful ability. It is cheating and deception, because the aim is to assign unmerited scores at the end of the day. Unfortunately, the same society that frowns at it is culprit in the same: parents, schools, children and even the government. Penalties are

spelt out against the crime but which are hardly implemented. Laudable measures heralded as ways to curb the menace suffer from poor implementation due to policy loopholes. Children of the poor and the rich are involved. Therefore, fighting the ugly trend has remained a far cry from reality. Some have proposed the use of new technologies, especially artificial intelligence (AI) as better ways to fight the problem. This study is conducted to find out the impact of AI in curding examination malpractice in Nigeria.

The introduction of new technologies, particularly those that are computer and Internet enabled, has really ushered in a new world with a new way of doing things synchronously and asynchronously, particularly in education (Kühl, Mühlthaler & Goutier, 2018). As a result, nations spend heavily to queue into the blessings of new and emerging technologies. Currently, attention is being shifted to artificial intelligence (AI) and machine learning (ML). Teaching and learning has actually been reformed and transformed courtesy of these modern tools. AI has really altered people's way of learning significantly (Guizzo, 2014). However, countries of sub-Saharan Africa, especially Nigeria, do not show ample readiness to embrace the realities of AI, and so are yet to integrate them into learning, particularly in conducting examination. Nigeria is still battling with the enabling environment for adequate implementation of AI-driven education. Little wonder then the nation continues to bring the rear in educational development and growth among other nations.

Artificial intelligence refers to all the technology-based and driven systems whereby human-assigned tasks are now performed by non-human agents (Lohr, 2016). Activities that are normally assign to humans only can now be performed by non-human devices. The technology of AI makes the machines think and act like humans with capabilities such as learning, information processing, speech recognition, and problem-solving. Apart from being used in promoting effective teaching and learning, AI can have benefits in terms of honest testing and examination (Hampton et al., 2013), and so serve as a means to fight examination malpractice that has pervaded schools in Nigeria.

Today, due to advancement in technology, national and international examinations are now computer-based as against the usual traditional paper and pen examinations. However, people worry about the integrity of such examinations. To this effect, AI-based invigilation (proctoring) may ensure that students take exams from the safety and comfort of their homes without jeopardizing the integrity of such examinations and their outcomes as the core purpose of examinations is to encourage more focused learning and to test what the students have learned. It should be noted here that the examination performance of students can open a door of opportunities for them.

To avert such occurrence, AI platforms provides an environment for ensuring students take exams under a completely impartial manner, and total watch, which may not allow for cheating. In this way, those who put in actual efforts receive the results they deserve, without candidates holding an unfair advantage undermining their hard work. So, students can take their exams with confidence.

Characteristically, AI monitoring software, in a bid to make it almost impossible for candidates to cheat, revolves around detecting cases of impersonation, behaviour analysis, and plagiarism (Hampton et al., 2013). A candidate needs a few simple technological prerequisites for successful and effective proctoring. Just one device with a functional camera and microphone is enough in most cases. Some platforms offer provisions for advanced

proctoring. An AI-proctoring system is the result of thousands of attempts to build, train, and perfect its malpractice-identification skills. For example, candidates who giraffe during exam might be captured as the AI-enabled camera picks them up repeatedly (Hampton et al., 2013). The AI-proctor then separates that video segment and tags it as 'unfair means'. The AI proctoring software classifies every one of the hundreds of events that occur during the process as possible malpractices. All of the events would determine whether or not the session should receive the mark of a suspected integrity violation.

Particularly, AI software identifies instances of malpractice through a pattern recognition as it catches a prevailing pattern of specific behaviors. The AI can detect patterns in data and try to look for regularities in the data at its disposal. Another way it does catch cheating students is through facial recognition via its ability to verify the identity of the cheating student in exam environment (McGuire, 2006). AI also catches cheating students through voice recognition by detecting speech patterns, and picking up sounds and match them with the background noise. AI can also detect eye movement detection by detecting a candidate who is gazing at the device's screen, a phone, or a book. It flags those instances where the eyes dart and stare towards any unnatural directions. With its ability for plane detection, AI can survey a cheating candidate's physical surroundings. The system will get a better knowledge of everything in a given environment when it is paired with object identification (Huang, 2006).

However, for effective performance of the AI, there is need for compatibility with most operating systems and devices, a simple and streamlined procedure of registration, transparency, advanced proctoring, multiple assessment channels, strong candidate data protection] and accuracy. Given the above, this article aims at studying the role of artificial intelligence in curbing examination malpractice in Nigeria.

This study is guided by four research questions:

1. What is Examination malpractice?
2. What is Artificial Intelligence?
3. What is the potential of applying AI in Curbing exam malpractices in Nigeria.
4. What are the challenges of applying AI in curbing Examination malpractice in Nigeria

The paper went ahead to make some recommendations and drew Conclusions from the study.

What is Examination Malpractice?

Examination malpractice or misconduct can be defined as dishonesty or fraudulence of concerned persons before, during or after examination targeted at assigning or obtaining unmerited scores or grades, which generally compromises the integrity and fairness of the assessment process (Dadzie & Annan-Brew, 2023). The West African Examination Council (WAEC) (2003) stated that exam malpractice can be construed to be a unwholesome or aberrant behavior embarked upon by examinees or examiners that questions the integrity of obtained grades after examination. Furthermore, Gomba (2023) argued that examination malpractice is synonymous with academic dishonesty, intentional or unintentional, in drastic violation or breach of academic integrity. The ugly trend has become so deeply entrenched that it can be argued that nearly all stakeholders of the education sector are culprits in one way or the other (Skshidlevsky, 2022).

Exam malpractices come in different shapes, magnitudes and intents. They include copying, possessing or using unauthorized materials (cheat sheets, notes, electronic devices), communicating with other candidates during the exam, impersonation, acquisition of question papers before exams among others. It is quite unfortunate that the many efforts made to arrest the monster like unannounced visit to exam centres by external supervisors, ensuring that all answer scripts are collected by an authorized person at the end of the exam, handing over to the law enforcement agents any candidates caught cheating during the exam, proper searching of students who go out during exams to ensure that no foreign materials are with them, filling of forms by candidates and collection by invigilators on each paper, preventing candidates from "giraffe" during an exam, preventing the use of prepared materials during an exam, handing over to the law enforcement agents, all those caught assisting the candidate during an exam and preventing individuals who are not registered exam invigilators from giving external assistance to students during an exam have not yet yielded the desired fruit as the trends continues and increases in geometric progression (Adie & Oko, 2016; Dadzie & Annan-Brew, 2023). Consequently, not much confidence is reposed on examination outcomes and the entire school system while students hardly subject themselves to rigorous study and teachers merely teach just to cover the syllabus. Those who hire graduates now establish their own checkpoint to ensure that prospective workers are adequately assessed to fit into what they want (Okunloye et al. 2019). This unfortunate development has given rise to the call for technology in salvaging the situation, particularly through the use of AI. It is very important to maintain academic integrity and adhere to exam rules to ensure fairness and validity.

To ascertain the quantity and quality of implementation of school curriculum, particularly as regards how well teachers have taught and students have learnt, exams are taken periodically. Therefore, a considerable amount of focus of teachers, students and the Ministry of Education is geared towards examinations of different kinds, purposes and magnitude. This also explains the importance attached to certificate obtainment much more than acquisition of knowledge and skills in Nigeria. This situation precipitates the ugly trend whereby teachers, invigilators, parents and students aid and abate examination malpractice. This jeopardizes the veracity of both private and public examinations for selection, certification, recruitment, promotion, and related purposes, the objectives of national educational systems and, in fact, and national progress (Dadzie & Annan-Brew, 2023).

In Nigeria, the first acknowledged act of exam malpractice was in 1914 Senior Cambridge Local Examination experienced massive leakage (Onyibe et al., 2015; Udim et al., 2018) in which some teachers were complicit for bribery. Today, it has become a norm in the educational arena and, such outcomes of examinations, especially in Nigeria are vigorously questioned.

What is Artificial Intelligence?

Artificial Intelligence (AI) refers to the development of computer system which can perform tasks that can typically requires human intelligence for example learning, problem solving, reasoning, language understanding e.t.c.

AI systems use algorithms and data to make decisions, without human intervention.

Computers are now heavily integrated into educational and instructional activities even in conducting examination. Kühl, Mühlthaler and Goutier (2018), trying to elucidate the meaning of AI, said that computers or machines do not have to be human in order to achieve results that humans are expected to do. As a cognate (related) term, machine learning (ML) refers to a system of learning whereby people can leverage on past knowledge or experiences in order to decipher the future. Furthermore, ML involves a systems of learning that applies algorithms (set of calculation rules) to facilitate meaningful understanding of the relationship between data variables. In this situation, explicit patterns are studied in a high dimensional space without being specifically directed (Guizzo, 2014). Such relationships being deciphered can be applied to a new data set, so as to predict outcomes. ML revolves around statistical approach to data analysis and application. However, it differs from traditional statistics in the sense that it involves analytical rules that are not known already.

AI developed from the notion that machine can function as humans not only in the psychomotor domain but also in the cognitive domain. These non-human devices are considered beings (Artificial Intelligence), an idea that has been around for a long time. AI is rooted in ancient myths, stories and rumors of artificial beings endowed with intelligence or consciousness by master craftsmen. In fact, the ancient Greeks had myths about robots, and Chinese and Egyptian engineers built automatons. Thus, beginnings of modern Artificial Intelligence (AI) can be traced to classical philosophers' attempts to describe human thinking as a symbolic system. However, AI was coined formally in 1956, by John McCarthy during a conference (McGuire, 2006). Those in the conference who were fascinated with the idea forecasted a great future for AI. Many of them predicted that a machine as intelligent as a human being would exist in no more than a generation and they were given millions of dollars to make this vision come true. Eventually, the U.S. and British Governments stopped funding undirected research on artificial intelligence, and the difficult years that followed was later known as an "AI winter" – 1974 to 1980 (Huang, 2006). The field later revived in the 1980's when the British government started funding it again in part to compete with efforts by the Japanese (Yang, 2006). But by the late 80s the investors became disillusioned by the absence of the needed computer power (hardware) and withdrew funding again. The experience brought about another major winter from 1987 to 1993.

However, research began to pick up again after that, and in 1997, IBM's Deep Blue became the first computer to beat a chess champion when it defeated Russian grandmaster Garry Kasparov (Lohr, 2016). Investment and interest in AI boomed in the first decades of the 21st century, when machine learning was successfully applied to many problems in academia and industry due to the presence of powerful computer hardware. This was in the form of access to large amounts of data (known as "big data"), faster computers and advanced machine learning techniques which were successfully applied to many problems throughout the world's economy. In fact, McKinsey Global Institute estimated in their famous paper "Big data: The next frontier for innovation, competition, and productivity" that "by 2009, nearly all sectors in the US economy had at least an average of 200 terabytes of stored data". By 2016, the market for AI related products, hardware and software reached more than 8 billion dollars, which raised the interest in AI to reach a "frenzy". The applications of big data began to reach into other fields as well, such as training models in ecology and for various

applications in economics (Hampton et al., 2013). Advances in deep learning drove the progress of AI to image, video processing, text analysis, and speech recognition.

The first model of AI is called foundation models, which include machine learning models with pre-trained abilities to carry out different tasks. This model can be called the "self-supervised learning." Examples include popular tools like Open AI's Chat GPT and Microsoft's Bing Chat that utilize foundation models. Developers train foundation models on a vast amount of data with neural networks, which is why this model can adapt to different uses and can be applied to different needs just like the human brain, such as answering questions, writing essays and stories, summarizing large information, generating code and solving mathematical problems (Lohr, 2016)

The multimodal models depend on multiple types (or "modes") of data like images, audio, video, and speech, and are wired to respond with a greater variety of results.A popular example of multimodal AI is a vision-language model, which "sees" visual inputs (like pictures and videos) through a process called computer vision (Hampton, Strasser, Tewksbury, Gram, Budden, Batcheller, Duke & Porter, 2013).

Large language models (LLMs) can understand and generate text. They use deep learning methods combined with natural language processing (NLP) to converse like humans (McCorduck, 2004).Two branches comprise natural language processing (NLP) and Natural language understanding (NLU). It should be noted that both of these work in synergy to enable AI models process language similarly to people. These models of AI do this by learning from millions of examples to accurately predict the next word in a phrase or sentence. For example, the autocomplete feature on the cellphone is a type of NLP. Google's BERT is a more sophisticated, neural network-based NLP. The "large" in LLMs refers to the fact that developers train them with huge datasets, which allows them to translate, categorize, conduct sentiment analysis, and generate content. BERT and its associated programs can understand, classify, and respond to queries faster and more efficiently.

Another important AI model is the Diffusion Models. According to McGuire (2006), diffusion models split images into tiny pieces to analyze patterns and features. They can then reference these pieces to create new AI-generated images. The process involves adding "noise" to break up images. Then, reversing and "denoising" the image to generate new combinations of features. However, different diffusion model tools generate different images for the same input.

The Potentials of Artificial Intelligence in Curbing Examination Malpractice

AI software for examination proctoring is powered by digital technology, which has made educational activities easier and more flexible. It is based on cyber-physical systems, that have ability to function optimally with little or no assistance from humans (King, 2022).AI, which is the fourth industrial revolution has made educational tasks much easier (Raja &Nagasubramani, 2018). This has created multiple platforms that have revolutionized the educational sector whereby teachers can now explore different teaching approaches, in order to create effective instruction aimed at helping students discover their potentials (Oladele et al., 2023). AI-driven technologies supports the examination system and do not take over human roles (Orhani, 2023). Simply put, AI, also called machine intelligence, empowers machines to carry out a variety of tasks, including learning, problem-solving, speech recognition, and planning. It combines both the physical and the digital work, that is,

humans and machines support each other making the individuals who need them learn the skills to operate them (Saleh, 2019). Artificial intelligence in the educational sector makes teaching a lot easier and more interesting for both the teachers and students, and teaches how to apply, create and analyze. Making teaching thus effective, it solves the possibility of resorting to exam malpractice since students earn their subjects in varieties of ways that promote hand-on learning, adequate feedback, self-paced and varied learning as well as self-examination. It equally promotes effective proctoring (invigilation), which goes along way in solving the problem of persistent malpractice.

There are two types of proctoring that AI facilitates (Fetsch, 2020). These are live proctoring and automated proctoring. Live proctoring is remote proctoring where a person actively supervises the examinee throughout the test. Automated proctoring, on the other hand, is completely automated and done using machine learning and facial detection technology. Automated proctoring is limitlessly scalable, while live proctoring requires extensive human resources. This discrepancy is also reflected in the respective costs. With AI Proctoring software, detection of examination malpractice becomes easier by analyzing patterns of behaviour such as facial patterns, cheating, impersonation and also flags plagiarism. The use of Artificial Intelligence (AI) in the prevention of examination malpractice is relatively new because human proctors (invigilators) have always been used but they have some limitations as they might not be able to detect all activities of the students or find some materials hidden.

Additionally, the positive impact of AI in educational assessment has been of assistance to both the teacher and students. It gives room for personalized learning which through this can help create questions or activities based on his learning preferences. It also uses Intelligent Tutoring Systems (ITS) to help students know their ability in tests so as to improve where they are lacking. Using its grading software, grading of students' papers becomes easier and faster in terms of essays, problem-solving questions and multiple-choice scripts and many others, unlike humans who get easily tired at some point when grading. This creates more time on the part of the teacher to prioritize their energy on other necessary things. Skshidlevsky, (2022) stressed that live proctoring can detect examination malpractice through identity verification, continuous monitoring, audio and video surveillance, exam room scanning and others.

Deep Learning, an aspect of AI, helps computers understand just like the human brain; Machine Learning is the technology that functions by using past data inputted in the system; while Natural Language Processing deals with interpreting human languages to computer languages (Kovač et al., 2023;). These technologies have birthed some products of artificial intelligence which can either be software or hardware, such as chatbots, speech recognition, image recognition self-driving cars, smart refrigerators, virtual assistants and robots (Daley et al., 2023). All these applied, according to Koch(2022) causes a great advantage to the society in terms of;

1. Cyber security: detecting cyber threats or analyze network traffic.
2. Finance: fraud prevention
3. Healthcare: giving accurate diagnoses, predict disease outcomes
4. Transportation; building of self-driving cars

5. Education; enhancing personalized experience, promoting time management, assess the progress of students and also give accurate feedback.

Basic AI software used for proctoring include Rapid Test and IGZAM used by JAMB to conduct external exams. These software can detect any suspicious behaviour during examination.. In addition to this software used, Artificial Intelligence technologies such as CCTV cameras are installed to invigilate the examination. All the benefits of AI notwithstanding, the phenomenon has not yet achieved wide integration in both standardized and teacher-made tests in Nigeria due to some structural a policy problems.

Notwithstanding the laudable educational benefits of AI in education, there are some challenges bedeviling the application of AI for education in sub-Sahara Africa, especially in Nigeria. These challenges revolve around policy, technology and security.

Challenges of Application of AI in Curbing Examination Malpractice in Nigeria Education.

A significant problem facing integration of AI/ML is policy. The problem of political instability in Nigeria has made it rather difficult to realize the goals of AI in education as successive governments have not been able to achieve policy stability. Each government formulates technological policies, which are abandoned by successive ones. Consequently, reaching a comprehensive policy framework, much of which would require overhaul of current policies and creation of new ones, has become difficult. There is no doubt that enjoying the benefits of AI depends largely on good systems of governance, which constitute part of the policy framework. Although educators laud AI, the problem is that issues affecting the procurement, application and maintenance of AI tools lack well-defined and implemented AI policies. Compared to developed continents like Europe, Canada, the U.S., and China, there is no well-documented strategy for AI in Nigeria. It is true that AI has a global application, yet the issue of contextualization is paramount (Camerer, 2017).

Technologically, for optimum application of AI in education, enabling environment with adequate infrastructure is a prerequisite. There is need for state of-the-art data facilities and requisite AI expertise, which are largely inadequate in Nigeria. Since AI requires robust networks, immense computing power, and stable connections, the need to develop an effective and efficient information and technology (IT) structure. Unfortunately, there is a wholesale absence of sufficient technical infrastructures, AI skills and data gaps as well as poor regulatory environments all of which limit the application of AI for education. The fall out of all of these is seen in intellectual and financial disadvantages.

Another problem revolves around security and related data Issues. AI helps teachers and students to collect and analyze data. This raises the problem of data security and authenticity of analysis. This specifically covers the issue of privacy and data protection. Safety and security issues regarding AI-based systems revolve around concepts such as safe AI for use by humans, verification, validation, self-awareness in adverse environments. As AI systems becomes more integrated into teaching and learning, participants of educational programmes will be more exposed to unintended risks as other people could gain unauthorized access to their otherwise private lives, among other potential problems (LeCun, Bengio& Hinton, 2015).

Furthermore, since AI relies on data, its outcome and subsequent use are as good as the data put into it. Where the given data provides for a chance of having a misleading outcome, there is a high chance that AI could bring about serious problems to that effect.

Conclusion

AI promises to radically curb the persistent menace of examination malpractice in Nigeria as it is considered a better option than the conventional invigilation methods with their myriads of setbacks. Therefore, the need to apply and integrate AI in Nigeria's education in order to achieve enhanced knowledge and competency acquisition in the classroom settings and at home. Reviewed literature, so far, support the view that use of AI has the potentials of curing examination misconduct through its proctoring software that can depict any suspicious behavior detected in real time for curbing examination malpractice. Most examination bodies in Nigeria still use human proctors even though the technology promises wonders in terms of curbing exam malpractice. A robust collaboration among AI startups, researchers, policy makers, industry players, educational institutions and government agencies is required to realize the full benefits of AI for education in Nigeria. Invariably, AI has the capability to enrich teaching and learning experience in Nigeria, thus fostering the achievement of the Sustainable Development Goal. AI, like every other technology, is a tool whose effectiveness largely depends on how it is used, and the availability of data and electricity.

Recommendations

Based on the conclusion drawn from the study, the following recommendations are made by the researcher.

1. The use of AI proctoring systems in curbing examination malpractice by Examination bodies in Nigerian education sector.
2. Artificial Intelligence should be integrated systematically into standardized assessments in the Nigerian education sector to improve the process of curbing examination malpractice compared to human proctors.
3. There should be the provision of cybersecurity for online examinations in the Nigerian education Sector using AI to protect it from unauthorized access or leaks.
4. The government should adequately fund I CT and its support infrastructure in the Nigerian education sector.
5. Therefore, it is necessary that Nigeria provides the enabling IT structure and policies to ensure maximum and optimum implementation of AI.

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