Perception on the Use of Artificial Intelligence for Curbing Examination Malpractices during Standardised Examinations in Nigeria

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Abstract

This study examined the level of perception of the use of Artificial Intelligence for curbing examination malpractice in Nigeria. Three research questions were formulated to guide the study. The study adopted qualitative research of the exploratory type. The population of this study comprised of twelve examination body staffs from JAMB, NECO, WAEC and NABTEB Ilorin. Kwara State. The research instrument used for this study was a designed interview guide titled "Artificial Intelligence in Curbing Examination Malpractice during Standardized Examinations". The research questions were answered using a thematic approach. Findings from this study revealed that JAMB makes use of proctoring software while NECO, WAEC and NABTEB makes use of human proctors. More so, findings show that staffs from all the examination bodies have positive thoughts towards the use of Artificial Intelligence in curbing examination malpractice. Moreover, Artificial Intelligence significantly contributes to curbing examination malpractice. It is hereby recommended among others that AI proctoring software should be adopted in curbing examination malpractice supported with human proctors at the initiation stages.

Keywords: Perception, Artificial Intelligence, Examination malpractices, Proctors, Standardised Examination

Introduction

Examinations are integral to certification around the world in educational systems and the way they are administered has a significant impact on how well educational objectives are met. However, the importance attached to education makes individuals focus their goals on just the certificate and not the knowledge nor the learning process, leading to the students participating in illegal acts during assessments, known as examination malpractice. If examination ethics are not

rigorously followed in the administration of private and public examinations for selection, certification, recruitment, promotion, and related purposes, the objectives of national educational systems and, in fact, national progress become a mirage.

Examination malpractices refer to dishonest or fraudulent behaviors committed by individuals, before, during or after such examination with the aim of taking undue advantage and compromising the integrity and fairness of the assessment process (Okunloye et al., 2019; Dadzie & Annan-Brew, 2023). Examination mal-practice as defined by West African Examination Council (WAEC) (2003) is an irregular behavior or act exhibited by candidates or anybody charged with the responsibility of conducting examination in or outside the examination hall. Gomba (2023) views examination malpractice in terms of academic dishonesty which may be intentional or unintentional, basically leading to a violation or breach of academic integrity. It is crucial to emphasize that examination malpractice is a behavior that is shared by all members of the academic community (Skshidlevsky, 2022).

In Nigeria, this act was first recorded in 1914 when the Senior Cambridge Local Examination was leaked (Onyibe et al., 2015; Udim et al., 2018). The teachers turned out to be a part of this illicit act mostly because of bribery. This can be said to be due to the low importance the teachers are given in the country causing them to participate in any way possible to fend for themselves. Furthermore, exam malpractice is a social threat, but some students now view it as a recognized and acceptable way to pass exams at all educational levels. This perception is beneficial, as it seems to be effective, but the drawback is that many students have results that do not accurately reflect their abilities, endangering the caliber of graduates the educational system produces (Udim et al., 2018, Idris et al., 2021).

These malpractices can take various forms, and they pose a serious threat to the credibility and effectiveness of standardized examinations. Some common examination malpractices include copying from another student's answer sheet, possessing or using unauthorized materials (cheat sheets, notes, electronic devices) during the exam and communicating with other candidates during the exam among others. Various efforts are being deployed in curbing examination malpractices such as making 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, attendance forms must be filled by candidates and collected 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 (Adie & Oko, 2016; Dadzie & Annan-Brew, 2023). Assessing examination malpractice from a social viewpoint, Okunloye et al. (2019) examined the impact of value clarification on tackling the menace of examination malpractices. While these efforts have both their positive and negative sides, leveraging technology cannot be over-emphasised with the current industrial revolution.

The industrial revolution was the start of the age of digitalization. However, before this age, there was the pre-industrial society which occurred between the eighteenth and nineteenth century where life was much more sophisticated. These societies had limited technology to carry out their work and relied mostly on manual labour (Ayanwale et al., 2022). During this period, education was mostly informal, that is, taught within the family and it entailed mostly practical skills for survival in the society. Meanwhile, formal education was limited to all and available to just the male gender before it became compulsory. This brought a little advancement to the society, making many people educated, libraries were also built (Becker & Woessmann, 2019).

It was the third industrial revolution that marked the digital era which brought about major modern developments and also created millions of employment opportunities worldwide, improving the standard of living of the people and making them richer both in resources and knowledge compared to the first and second industrial revolution (Ayanwale et al., 2022; Blinder, 2006). This age is where the use of computers, integrated circuits, drones, Big Data, Artificial Intelligence, robots, Internet of Things (IoT) came in and can be described as the Information age (Adedimeji, 2021). Education during this period makes use of the internet and develops some features that were available during the second industrial revolution. Education in the third industrial revolution deals with online learning, searching for different approaches to teaching, searching for alternative information asides what was taught in class (Becker, 2009; İŞLER, 2022; Mohajan, 2021).

The fourth industrial revolution, which is the revolution that has occurred to date, comes last. In today's digital age, communication takes place via digital tools, digital gadgets, and other technology that have been around since the middle of the 20th century. The Fourth Industrial Revolution, or 4IR, can be used to describe the digital world of today. It builds upon the achievements of earlier industrial revolutions, such as the First and Third Industrial Revolutions. It expands on the third industrial revolution to create new products and further refine what has previously been developed. It works with what are known as cyber-physical systems, which are systems that can function with little or no assistance from humans (Ayanwale et al., 2022; King, 2022). The use of industrial revolution triggered technological advancement brought about innovation and made tasks much easier (Raja & Nagasubramani, 2018). The fourth industrial revolution applied in the educational sector has given teachers the opportunities to explore different teaching approaches, to discover the potentials of each student (Oladele et al., 2023). AI-driven technologies supports the examination system and do not take over human roles (Alam, 2021; Ayanwale et al., 2022; Orhani, 2023; Timms, 2016).

The term artificial intelligence, also referred to as machine intelligence, is intelligence manifested by machines. It can be used for 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 (Honavar, 2016; Saleh, 2019). Technology has to be embraced in all sectors of the economy because it is a major factor to be an active participant. Quality education contributes to societal advancements and gives them context. Not only does it prepare individuals for jobs, but also help identify themselves and develop their personalities. The United Nations (UN) further states that quality education acknowledges the enthusiasm for knowledge which should be available to all (Elfert, 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. Fetsch (2020) explained that there are two types of online proctoring: live proctoring and automated proctoring. Live proctoring is remote proctoring where a person actively supervises the test-taker 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 behavior such as facial patterns, cheating, impersonation and also flags plagiarism (Nigam et al., 2021; Shinkan 2022). The use of Artificial Intelligence (AI) in the prevention of examination malpractice is relatively new because human proctors 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. Lastly, its grading software has made the grading of students' papers easier and faster in terms of essays, problem-solving questions and multiple-choice scripts etc. 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 (Singh, 2022). Skshidlevsky, (2022) stressed that live proctoring can detect examination malpractice through identity verification, continuous monitoring, audio and video surveillance, exam room scanning etc.

Deep Learning helps computers understand just like the human brain; Machine Learning is the technology that functions by using past data inputted in the system; Natural Language Processing deals with interpreting human languages to computer languages (Kovač et al., 2023; Reeve, 2020). 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, robots (Daley et al., 2023). All these applied, causes a great advantage to the society in terms of cybersecurity; detecting cyberthreats or analyze network traffic, Finance; fraud prevention, Healthcare; giving accurate diagnoses, predict disease outcomes, Transportation; building of self-driving cars, Education; enhancing personalized experience, promoting time management, assess the progress of students and also give accurate feedback (Koch, 2022).

Artificial Intelligence can be found in all sectors of the economy, from the health sector, business sector to the education sector. Some of the most important roles AI has exercised in these

sectors are it has helped with breaking down difficult and strenuous tasks, increasing efficiency in production, reducing human errors (Gonzales, 2023; Qin et al., 2023). In this paper, the use of AI in the education sector and its impact in curbing examination malpractice will be focused on.

Purpose of the Study

The main purpose of this study is to investigate the perception on the use of Artificial Intelligence in reducing examination malpractice in the educational sector. This is to develop and implement AI based machines that can detect and prevent cheating during exams. Specifically, this study among others seek to:

i. Find out the available AI software for curbing examination malpractice during Standardised Examinations in Nigeria?
ii. Assess the level of use of Artificial Intelligence technologies used for curbing examination malpractice during Standardised Examinations in Nigeria?
iii. Examine the level of confidence in the ability of Artificial Intelligence to effectively detect and prevent examination malpractice during Standardised Examinations in Nigeria?

Research Questions

The following research questions are formulated to guide the conduct of the study.

i. What are the available AI proctoring software for curbing examination malpractice in Standardised Examinations in Nigeria?
ii. What do you think about using AI technologies to curb examination malpractice during Standardised Examinations in Nigeria?
iii. Are you confident in the ability of AI technologies to effectively detect and prevent examination malpractice?

Methodology

This study employed a qualitative research of the case study type. This design is deemed appropriate for gaining deep insights on the application of AI for curbing examination malpractice from the different stakeholders involved in standardised examinations in Nigeria (Falaye, 2018). The population of this study comprises stakeholders of standardised examination bodies, JAMB,

NECO, WAEC and NABTEB. Twelve respondents were sampled using a snowball sampling technique which constituted the sample for the study. Data were gathered using in-depth interviews conducted physically and electronically. The data gathered was transcribed using descript and subjected to the inductive data anaysis approach presented thematically in relation to the research questions using Atlas.ti.

Answering Research Questions

Research Question 1: What are the available proctoring software for curbing examination malpractice in standardized examination in Nigeria?

According to the information obtained from the interview, the JAMB exam body stated to make use of different exam proctoring software each year. In 2022, RapidTest was used and in 2023, IGZAM was deployed. This proctoring software is said to flag any behavior found to be suspicious. In addition to this software used, Artificial Intelligence technologies such as CCTV cameras are installed to invigilate the examination.

Additionally, interviews from the NECO and NABTEB respectively states they do not make use of any proctoring software, instead, they make use of human proctors and technologies such as the biometric.

> *"So, we have not started using artificial intelligence to curb examination malpractice. What we are using now is the manual one in which you can use to curb the exam malpractice and these online registration, e-passport, photograph, biometric capturing. Those are the things that we use".*

A staff with NABTEB stressed that the introduction of passport biometrics will aid having very clear identities so that which will avoid impersonation. Also, an interviewee stated some proctoring software he is aware of that can be used to curb examination malpractice in Nigeria. They are:

> *"Proctortrack, ExamSoft, ProctorU, Respondus, LockDown Browser, Kryterion, ProctorExam".*

Another respondent from WAEC also indicated that:

> *"Generally there are a good number of proctoring softwares, but in this part of the world it would be difficult to be used due to network issue and electricity. The one WAEC is using to report any form of malpractice which may sometimes not be able to use because we must*

battle rural areas network, at this period many of our candidate drift to the rural areas to engage in malpractice. You know we must be there physically. Sometimes you must spend more hours trying to get those involved in malpractice, meanwhile WAEC is trying their best to be able to do that. But any standard software to be used now is not so visible in Nigeria."

However, other available technological-driven equipment's for curbing examination malpractice are thumb print on machine, using of passports and using CCTV camera too at examination venues. Another respondent from WAEC indicated that:

"I think we have a favorable data Management, I've forgotten the full details, and that we use to checkmate our objective responses. So, where there are examination malpractices, you will be able to fish it out. And it will tell us that this candidate has created during the conduct of the examination".

Research Question 2: What do you think about using Artificial Intelligence (AI) technologies to curb examination malpractice?

To answer this question is information gathered from the in-depth interviews as follows:

The interview with NECO on the use of Artificial Intelligence technologies to curb exam malpractice have shown to be a positive one. As stated, it is shown to be effective, prompt, provides equal and fair treatment etc. Additionally, another Interviewee states it being capable of detecting impersonation.

"So, during registration like that, their biometrics will be captured if they have done it online. They'll take their passport photographs and biometric capturing. Their fingerprint will be taken. During the exam, the supervisor will use it to verify if the candidate that the e-passport shows is the same candidate writing the exam. So that's how we use to curb exam malpractice."

A similar view was also given by the JAMB interviewees. A participant state that

"I think AI has been really effective in curbing examination malpractice because of its ability to modify any examination process."

Another noted that:

"I think of AI as one of the best methods in curbing examination malpractice compared to humans".

""The adoption of AI should come with transparency especially in the evaluation process and students should know what they are involved with because it makes use of their data."

These show the effectiveness, accuracy and level of experience they have in using Artificial Intelligence to curb examination malpractice.

While two of the respondents from WAEC and NABTEB indicated that:

> *"Using Artificial Intelligence (AI) technologies to curb examination malpractice is very good if it can be used. Then all of us then must be ready to be fair to everybody because it is human being that will do the programming. And if human beings that will do the programming is not fair, then the whole essence of the AI is gone. But once we are ready to be fair to everybody, without minding the outcome, then the AI is good to go, and there will not be issue of a compromising the fairness and integrity of examination body. Everybody will now have faith in the examination body. Now we are currently moving into that, into a technology-based examination. But the question is that Nigeria as a country, are we ready? Because where is the technology to use? Where is the facility? You see people travel for JAMB that introduced technology-based test for their candidates. People traveling from far and near, to be able to write the examination, would that also be tolerated for WAEC as an examination body where we have almost 1 million plus candidates that will take the examination for over a month? I think it now depends on the country, being ready to take it up as a challenge".*

Another respondent from WAEC indicated that using Artificial Intelligence (AI) technologies to curb examination malpractice as follows:

> *"Using artificial intelligence will go a long way in helping us. Because now, as far as Nigeria is concerned, and people out of sympathy and empathy find it difficult to report examination malpractices. But with artificial intelligence that does not know A from B, and that cannot differentiate A from B, I think it's a long way to bring about fairness and equity in detecting examination malpractice".*

Another respondent from WAEC indicated that using Artificial Intelligence (AI) technologies to curb examination malpractice depends on the level of AI engaged in terms of expertise.

Research Question 3: Are you confident in the ability of Artificial Intelligence technologies to effectively detect and prevent examination malpractice?

To answer this question is information gathered from the in-depth interviews as follows:

The responses gotten from NECO interviewees fall under not being confident, being confident and unsure of the use of Artificial Intelligence technologies in detecting and preventing exam malpractice. The statements as said are below:

> *" some of our teenagers said they have used it before. It gave them the correct answer, It did the task the AI was supposed to do for them correctly. Some said no. There are times the AI would not even give them the desired results."*

Another said;
"Yes, I am confident"

This is based on some reasons he gave such as detecting suspicious behavior, promptness, it being scalable.

Another NECO participant also observed that;

> *"This question might be a bit hard for me to answer based on not having any hands-on experience on its use or witnessing its use because for me to be confident in its ability, I must have seen it performing its said functions."*

JAMB interviewees stated that they are confident in the ability to detect and prevent examination malpractice. Their statements are as follows

> *"Yes, I'm confident in the ability of AI technologies to effectively detect and prevent examination malpractice. Note: This is because of the point stated in question 2. That is its inability to be modified to suit a candidate."*

> *"Yes, I am confident in the ability of AI to detect and prevent examination malpractice"*

> *"I'm 90% confident in the use of AI technologies to curb exam malpractice"*

Another respondent from NABTEB indicated that the ability of Artificial Intelligence (AI) technologies to effectively detect and prevent examination malpractice are *" Yes" and "it's highly efficient".*

Another respondent from WAEC indicated that: *if properly programmed and without fear and bias, so I think it will go a long way in helping us".*

Another respondent from WAEC indicated that the ability of Artificial Intelligence (AI) technologies to effectively detect and prevent examination malpractice are:
" I don't know. But it can detect".

Another respondent from WAEC indicated that the ability of Artificial Intelligence (AI) technologies to effectively detect and prevent examination malpractice are:

"It can never prevent it"
Another respondent from WAEC indicated that:

"Then all of us then must be ready to be fair to everybody. Okay. Because it is human beings. That will do the programming. And if human beings that will do the programming is not fair, then the whole essence of the AI is gone. But once we are ready to be fair to everybody, without minding the outcome. Then the AI is good to go, there will not be issue of a compromising the fairness and integrity of examination body. Everybody will now have faith in the examination body. Even if you believe in them, they will believe in it. Now we are currently moving into that, into a technology-based examination. But the question is that Nigeria as a country, are we ready? Because where is the technology to use? Where is the facility? You see people travel for JAMB that introduced technology-based test for their candidates. People traveling from far and near, to be able to write the examination, would that also be tolerated for WAEC as an examination body? So where we have almost 1 million plus candidates. I have been writing the examination for over a month. I think it now depends on the country, as well, to take it up as a challenge".

Still on how can Artificial Intelligence (AI) be integrated into standardized examination for curbing exam malpractices without compromising the fairness and integrity of the examination process, another participant from WAEC indicated that:

".....it's going to be for people in the IT department, to be able to answer when it comes to those levels of AIs and what has been, but I believe it can be reduced. It'll have its own limits, its own limitations. It can be used at least within its own limitations to try and detect the malpractice and punish them".

Discussion of Findings

The first findings of this study shows that available proctoring software used by each examination body differs in Nigeria. JAMB makes use of different proctoring software each year in flagging any suspicious behavior in real time while NECO, WAEC and NABTEB makes use of human proctors to curbing examination malpractice. This show that JAMB makes use of Artificial Intelligence more than NECO, WAEC and NABTEB. This is in line with Skshidlevsky, (2022) who states that Live proctoring can detect examination malpractice through identity verification, continuous monitoring, audio and video surveillance, exam room scanning etc. Furthermore, these examination bodies engage in the introduction of biometric, visible passports, and thumb-printing. This shows that AI is currently sparingly engaged in Nigeria which requires that all hands should be on deck in leveraging on the fourth industrial revolution which are able to operate with little or no human intervention (Ayanwale et al., 2022). This will also add to its application in the educational sector in the area of educational assessment (Oladele et al., 2023). This is particularly

germane as AI just to act as a support to the system and not take over human roles (Alam, 2021; Ayanwale et al., 2022; Timms, 2016).

The second finding show the positive views by the respondents from all examination bodies (JAMB, NECO, WAEC and NABTEB) towards the use of Artificial Intelligence technologies in curbing examination malpractice. This is due to the fact that it carries out the activities just how it is expected to such as detecting impersonation and its accuracy in analysing data. JAMB specifically stated that Artificial Intelligence is the best method in curbing examination malpractice compared to humans. This result is in line with Thales (2023) that shows Biometric registration is the system which requires capturing and storing a means of identification of an individual through the unique characteristics. This method is seen as the most preferable in detecting impersonation because of the individual differences present. This brings about the similar answer of being confident in the ability to detect and prevent exam malpractice because they understand and have more hands-on experience on the use of Artificial Intelligence in curbing Examination Malpractice. Also, according to Wangare & Simwa (2022) states that only human proctoring has been found of not being able to curb examination malpractice which caused the introduction of AI in curbing examination malpractice to work hand-in-hand and produce an efficient result. Another issue which was stressed despite the positive disposal was on the readiness of the country considering the large number of candidates in relation to the facilities needed. While the study by Ayanwale et al. (2022) reveal readiness by teachers to embrace 4IR skills to enhance their pedagogy and learning process, this should also be looked into by examination bodies in Nigeria in leveraging the gains of the fast-moving technological advancements in the 4IR era.

The third finding explains that despite the effectiveness of Artificial Intelligence in curbing examination malpractice, few NECO respondents are not totally confident in its ability due to not having any hands-on experience of Artificial Intelligence or based on what they have been told. JAMB Respondents who are confident in its use have in a way had an experience with these software or devices and as a result of its inability to modify examination process, eliminating fair or unequal treatment. Considering that AI can utilize facial recognition technology to monitor candidates during exams, this can go a long way in discouraging students from attempting to cheat or use unauthorized materials, as they know they are being observed. This is in line with King (2022) which revealed that AI-powered systems can also detect any unusual behavior or suspicious

activities, such as excessive eye movements or communication between candidates, further reducing the likelihood of malpractice. The level of confidence displayed is due to its inability to modify any examination process. This is in line with Jibrin (2021) which states that the key aspect to introducing AI in Educational Assessment is to act as a support system to the teachers which in return provides efficiency, fair evaluation, enhanced feedback, scalability to ensure a more personalized and accessible learning to students. Furthermore, the combination of Visible Personnel proctoring (Supervisor) and AI proctoring system was stressed for in-school standardised examinations will help in analyzing students' behavior during examinations by assessing factors like eye movement, body gesture and any signs of cheating (Nigam et al., 2021). While AI proctoring will create a culture of honesty and integrity among the students under the watch of CCTv cameras, the issue of ethics is also being stressed (Coghlan et al., 2021). Fetsch (2020) also stressed that the best way to detect foul play among the examiners in real time is to work hand in hand while integrating the human with AI proctoring. This is particularly germane with early technology adopters for a seamless integration.

Conclusion

This study concluded that while there are available proctoring software which flags any suspicious behavior detected in real time for curbing examination malpractice, most examination bodies in Nigeria still use human proctors. However, the use of Artificial intelligence technology is thought as being more effective and majority of the respondents' state they are confident in the ability of AI-based approaches for curbing examination malpractice in Nigeria.

Recommendations

Based on the finding and 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 should be politicized in Nigeria;
2. Artificial Intelligence should be integrated systematically into standardised assessments in Nigeria to improve the process of curbing examination malpractice compared to human proctors.

3. Adopt the use of secure and encrypted online platforms for exam delivery, ensuring that the content is protected from unauthorized access or leaks with already integrated AI functions for monitoring potential malpractices for cost effectiveness.
4. There should be adequate funding should be made available by the government to support the needed infrastructure.
5. Adequate measures should also be taken to ensure the ethical use of (AI) and protect students' privacy during these examinations.

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