ISSN: 1118-5872

FOS

MULTI-DISCIPLINARY JOURNAL

(Alvan Ikoku Federal University of Education)

ARTIFICIAL INTELLIGENCE PROCTORING OF STUDENTS' EXAMINATION IN HIGHER EDUCATION INSTITUTIONS IN IMO STATE

[1]Amanze-Njoku Confidence Ngozi, [2]Akunye Eunice Ijeoma, [3]Anozie Keyna Chinyere
Lasakunye@gmail.com
08033362513
Department of Health Education
Alvan Ikoku Federal University of Education

ABSTRACT
This study, using a descriptive survey design, investigated the artificial intelligence proctoring in higher education institutions in Imo State. Three research purposes and three questions guided the study. The population of the study consisted of 30 respondents in the Department of Health Education in higher education institution in Imo State using purposive sampling technique A researcher-made structured questionnaire titled, "Artificial Intelligence Proctoring Questionnaire (AIPQ)" was the instrument for data collection. The instrument was structured after Likert modified four-point scale of SA - Strongly Agree (4), A - Agree (3), D - Disagree (2) and SD – Strongly Disagree (1). The reliability test showed a coefficient of 0.84, using split-half reliability technique while Cronbach alpha was used to test the instrument reliability. The data collected were analyzed with descriptive weighted mean statistics at 2.5 criterion mean. Result showed that AI proctoring facilitates automated monitoring of exams, behavioural analysis of examinees and promotes facial identification. Based on the result of data analysis, it was concluded that AI proctoring is a portent tool for ensuring test score integrity and curbing examination malpractices. The following among others, were recommended: Health education department in higher institution in Owerri should adopt automated examination taking and proctoring to fight against cheating and unmerited scores. The government should provide schools adequate number of computer and support facilities in order to fully automate examinations in tertiary institutions.
Key Words: Artificial Intelligence, Proctor, AI Proctoring, Examination, Cheating

Introduction

Given the introduction and integration of computer-based instruction, powered by modern educational technology, in the tertiary education system, it has become necessary to develop a computer-based technology that will not only assist teachers and students to have effective instructional activities but will also facilitate test integrity. Over the years, a significant bane of tertiary education quality in Nigeria is examination malpractice (Udim, Abubakar & Essien, 2018). Each year records increasing spate of malpractice, whereby underserving students are awarded high grades that casts aspersions on their true academic ability. In higher education institutions across Nigeria students have been caught cheating countless times in spite of lecturers' conscientious efforts to teach students with world-class pedagogical approaches (Udim et al, 2018). According to Adie and Oko (2016), students caught in the unbecoming act have been subjected to different degrees of disciplinary actions, such as seizure of papers, reduction in marks, and cancellation of papers; outright expulsion or being asked to repeat the course, all in the bid to curb the menace of examination malpractice all to no avail. This has continued to raise critical worries among relevant stakeholders in the education sector. Dadzie and Annan-Brew (2023) stated that analogue or traditional proctoring (invigilation of tests and examinations to ensure integrity) does not hold

promise of fighting or curbing the different shades of examination malpractices in an era of computer-based education. On the contrary, the recent introduction of artificial intelligence (AI), which is both an online computer-based educational tool for instruction and proctoring has been hailed as a major milestone achievement in fighting examination malpractice (Dadzie & Annan-Brew, 2023).

As against the pitfalls of traditional examination invigilation, bedeviled with some limitations like human biases, test validity and resource constraints (Fask, England & Sottile, 2014), AI is an online proctor that holds greater capacity for detecting fraudulent acts, implying it can increase the security and integrity of online examinations, also known as computer-based tests (CBT) (Harper, Bretag & Sadiq, 2020). Characteristically, AI proctoring systems are built and equipped with advanced technologies featuring algorithms and machine learning techniques that can detect when students cheat in form of carrying expos, using machineries or stealing from other students; or even plagiarize other people's work and present them as their own (Weiner & Hurtz, 2017). Harper et al. (2020) revealed that AI proctoring can enhance the fairness, security, and efficiency of examination processes. For this reason, many schools now see AI as the way out of academic cheating in whatever form and for whatever intent.

However, in spite of the increasing integration of AI proctoring, cautions have been advanced in applying it due to some undecided issues surrounding its effectiveness, accuracy, and impact on student experiences (Watson & Sottile, 2018). More so, factors like computer culture of Nigerian school system, availability of necessary infrastructure like power supply and availability of manpower have it necessary to question the adoption of AI proctoring in invigilating tertiary education examinations. Therefore, this study aims at ascertaining the proctoring role of AI among students of health education in higher education institutions in Imo State.

Statement of the Problem

Today, most examinations and tests in Nigeria are computer-based, particularly in health education department in higher institutions in Owerri. This new development raises some concerns about academic integrity and the potential for arresting the spate of fraudulent activities leading to underserving scores and performances. Before now, examinations and tests are proctored or invigilated using traditional means with their inherent limitations, such as human bias and resource constraints known for compromising the security and validity of online exams. Efforts over the years have been made to proffer solutions to the above problems, resulting in the developing and adoption of AI as a better option. It is claimed that AI technologies have the ability to fight examination malpractices through detecting originality, plagiarism and impersonations in exams. However, since its adoption, examination malpractice has not significantly reduced, which could be due to some fundamental problems. Moreover, there is a dearth of empirical studies on the efficacy of AI-proctor in terms of arresting examination malpractice as well as the availability of support systems like power supply, particularly in the study area. Specifically, problems that actually motivate this study include limited understanding of AI-powered proctoring effectiveness, concerns about students' privacy and bias and need for validation and standardization. To this end, it is imperative to determine the role of AI-proctoring among students vis-à-vis

examination integrity among students of Health Education in higher education institutions in Imo State.

Purpose of Study

This study examines the proctoring role of AI among students of health education in higher education institutions in Imo. Specifically, the study:

1. ascertains role of automated monitoring as AI examination proctoring tool in higher education institutions in Imo State.
2. investigates role of behavioural analysis as AI examination proctoring tool in higher education institutions in Imo State.
3. examines role of facial recognition as AI examination proctoring tool in higher education institutions in Imo State.

Research Questions

1. What is the role of automated monitoring as AI examination proctoring tool in higher education institutions in Imo State?
2. What is the role of behavioural analysis as AI examination proctoring tool in higher education institutions in Imo State?
3. What is the role of facial recognition as AI examination proctoring tool in higher education institutions in Imo State?

Review of related Literature

Examination Malpractice

In Nigeria's education system, examinations are periodically conducted to find out how well teachers have taught and how much students have learnt. Therefore, examination remains a significant tool for ascertaining students' performance, which explains the worry and anxiety students display during examination. This has led many students, teachers, invigilators, and parents into aiding and abating examination malpractice in various forms. 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). Examination malpractice or misconduct can equally be seen as dishonest or fraudulent acts before, during or after examination in order to assign or obtain higher scores or grades (Dadzie & Annan-Brew, 2023). Gomba (2023) equated examination misconduct with academic dishonesty that contravenes standard measures of academic integrity. In Nigeria, the first acknowledged act of exam malpractice was in 1914 Senior Cambridge Local Examination experienced massive leakage (Udim et al., 2018), involving some teachers and students.

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. Many ways of arresting examination malpractice like unannounced visit to exam centres by external supervisors, ensuring that all answer scripts are collected by an authorized persons, 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, compulsory filling of attendance forms by candidates, preventing candidates from “giraffe” during an exam, preventing the use of prepared materials during an exam have not yielded the desired result (Adie & Oko, 2016; Dadzie et al., 2023). Consequently, not much confidence is reposed on examination outcomes and the entire school system while students hardly subject themselves to rigorous study while teachers merely teach just to cover the syllable. Those who hire graduates now establish their own checkpoint to ensure that prospective workers are adequately assessed to fit into what they want (Okunloye, Balogun & Oladele, 2019). This unfortunate development has given rise to the call for technology in salvaging the situation, particularly through the use of AI.

Artificial Intelligence (AI)

AI-powered technologies are now heavily integrated into educational and instructional activities, especially as proctor tools Kühl, Mühlthaler and Goutier (2018) defined AI as computers or machines that are developed to work like humans. AI is a computer system that applies algorithms (set of calculation rules) to facilitate meaningful understanding of the relationship between data variables (Guizzo, 2014). It 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 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 by formally in 1956, by John McCarthy during a conference (McGuire, 2006 cited in Kühl et al., 2018). 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.

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 OpenAI’s ChatGPT 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 Potentials of Artificial Intelligence in Curbing Examination Malpractice

AI software for examination proctoring is powered by digital technology. It is based on cyber-physical systems, with the ability to function optimally with little or no assistance

from humans (King, 2022). AI is the fourth industrial revolution (Raja & Nagasubramani, 2018) that creates multiple platforms to revolutionize 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, Ndlovu & Spangenberg, 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, that support each other (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 solving the problem of persistent malpractice.

There are two types of proctoring that AI facilitates (Fetsch, 2020): 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 uses machine learning and facial detection technology. Automated proctoring is limitlessly scalable, while live proctoring requires extensive human resources. With AI Proctoring software, detection of examination malpractice becomes easier by analyzing patterns of behaviour like facial patterns, cheating, impersonation and plagiarism.

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 can help create questions or activities based on students' 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 interpret human languages to computer languages (Kovač, Nome, Jensen, & Skreland, 2023), using chatbots, speech recognition, image recognition self-driving cars, smart refrigerators, virtual assistants, robots, all of which can facilitate cybersecurity; detection of cyberthreats or analysis of network traffic, fraud prevention, giving accurate diagnoses, predict disease outcomes, enhancing personalized experience, promoting time management, assess the progress of students and also give accurate feedback (Daley, Pandey & Urwin, 2023; Koch, 2022). Basic AI software used for proctoring include RapidTest and IGZAM used by JAMB to conduct external exams. These tools can dictate any suspicious behaviour during examination. Furthermore, AI technologies, including CCTV cameras are installed to invigilate the examination.

In addition to the aforementioned, AI as a proctoring tool facilitates automated monitoring. AI is capable of automatically monitoring the whole examination process from beginning to the end. It can continuously put students' activities on check by tracking and detecting suspicious behaviour (Khan, 2020). Another proctoring ability of AI is behavioural analysis, which involves the scrutiny of persistent students' behaviours in order to identify actions that contravene accepted standard of behaviour that may be translated as cheating (Fliotska & Diatel, 2020). AI, as a proctoring tool, has the benefit of facial recognition, which necessary in the fight against impersonation whereby some machineries take examinations for registered candidates in order to make good grades for monetary compensations. This way, AI ensures that the one taking the examination is the one registered to take it through facial recognition (Bawarith, 2020).

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 (Daley et al., 2023). This can be due to some fundamental challenges for education in sub-Sahara Africa, especially in Nigeria. These challenges revolve around policy, technology and security. A significant problem facing integration of AI 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. Although educators laud AI, the problem is that policies affecting the procurement, application and maintenance of AI tools lack well-defined and implemented AI policies (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 is a given. 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, Y., & 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.

Theoretical Framework

This study anchors on the Social Learning Theory (SLT) as propounded by Bandura in 1977. The theory assumes that learning occurs in social context through observation and imitation of one another. Thus, in AI Proctoring, SLT implies observing behaviours of students as test-takers in an examination or test context in order to detect potential inclination to cheating as well as test irregularities (Flieller, 2016). AI proctors, in line with the tenets of SLT, can serve as the purpose of modeling expectations, as it clarifies examination conduct instructions and guidelines for students. The modern digital proctor can also ensure that students comply with rules (Weiner, 2018). These notwithstanding, AI proctor, like other computer-based educational tools, can be susceptible to some drawbacks like technical limitations, requiring ongoing maintenance and support as well as difficulty in adapting to certain contextual understanding, thus requiring human input for maximum benefit and efficiency (Weiner, 2018). However, the theory supports AI proctoring as a tool that produces the needed result by imitating and observing students' behaviours, dispositions and attitudinal patterns that portend acts of cheating or examination malpractice. This way, it works towards examination veracity and authenticity.

Empirical Studies

Khanna, Brodiya and Chaudhary (2021) examined artificial intelligence based automated exam proctoring system (AEPS), using consolidated qualitative analysis of extent studies and revealed that major factors affecting issues include security and privacy concerns, ethical concerns and how to ascertain the level of online examinations is at par with offline examinations in all aspects. This notwithstanding, the study reported that the AI proctoring system offers the benefit of face recognition that checkmates impersonation or use of machineries. Yamuna, Reddy, Praneeth, Akhil and Chandu (2023) conducted a study on online exam proctoring system using ML and reported that the security issues associated with the AI-based Online Proctoring Systems are privacy concerns, ethical concerns, cost, and usage of technology. Singh, Singh and Yadav (2024) embarked on a perspective study on artificial intelligence for examinations. The paper found that AI algorithms optimizes exam scheduling to avoid clashes and accommodate student preference while AI-powered adaptive testing can adjust difficulty level to match individual student ability, and personalized feedback can provide individual students strength and weaknesses. These tools may analyze course materials to ensure alignment with exam topics, countering issues like paper leakage, cheating and biased evaluations. Use of facial recognition and behavior tracking can maintain integrity without human invigilators. Similarly, Veeramani, Tharun, Krishna, Kumar and Prasad (2024) examined online exam proctoring system based on artificial intelligence. The study found that AI proctoring is user-friendly, and helps teachers to setup and monitoring exam process efficiently while providing students secure and accessible interface. The online proctor features real-time monitoring, customizable alerts for suspicious activity, and the elimination of physical examination centers as well as face recognition, the YOLO (You Only Look Once) algorithm, OpenCV library for robust exam proctoring. and achievement of academic integrity. Sahu and Kumar (2025) accessed AI-based proctoring system for online tests and reported that while traditional human-proctored exams face challenges such as limited scalability, high operational costs, and subjective error, AI-based proctoring upholds academic integrity through facial recognition, voice detection, behavioral analytics, and anomaly detection using computer vision and machine learning algorithms as well as

promoting real-time monitoring, necessary for addressing ethical concerns such as privacy, accessibility, and algorithmic fairness. Therefore, the study conclude4d that AI proctoring systems can significantly improve exam security and reduce cheating incidents. Challenges found include inclusivity and data governance to ensure the system is ethical, unbiased, and accessible to all users. In the same vein, Khan and Borse (2024) studied exam proctoring AI, and revealed that AI monitors students during their tests, to detect cheating or suspicious behaviours through facial recognition that confirms student identities, tracks eye movements, and analyzes background noise and movements. It can recognize suspicious behaviors, such as looking away from the screen frequently, talking, or having other people in the background. By using AI, the system provides a reliable and scalable way to ensure exam integrity. It ensures that personal information is protected at all times, giving both students and institutions peace of mind that their data is safe and secure. This approach can enhance the credibility of online assessments and support the growing trend of remote learning. Alessio, Malay, Maurer, Bailer and Rubin (2017) compared online exam results from proctored and non-proctored online tests, using one 147 students based on linear mixed effects models. Students who used an online proctoring software required less time for online tests and scored less points. Dendir and Maxwell (2020) used a quasi-experiment where a webcam software was used in online proctoring to evaluate high stake exams and reported that exam scores reduced significantly after online proctoring was introduced in the courses, indicating that cheating happened in online courses before proctoring software solutions were introduced. This implies that online proctoring software is an effective tool for promoting academic integrity in online learning. Similarly, Prathish, Narayanan and Bijlani (2016) compared malpractices detected using real (human) proctor and proposed software, and the recorded exam attempts were segmented to 14 timeslots. The human proctor and proposed software had a true false and true negative in terms of decision on malpractice in 11 out of 14 time slots. Their results also showed an accuracy of 80% for the automated proctor software in detecting the active window. In another study, it was reported by Hussein, Yusuf, Deb, Fong and Naidu (2020) that 12% of the students who took the automatically proctored exam in one of the campuses found difficulties in navigating through the questions. Some students reported an inability to complete the exam successfully.

Methodology

This study adopted descriptive survey design to investigate some variables or phenomenon of AI proctoring as a tool for mainlining examination score integrity among students of Health Education in higher institution in Owerri, Imo State. The population of the study was 30 respondents, consisting of 20 lecturers and 10 non-academic staff who serve as examination invigilators. Based on the population, all the 30 respondents were included in the study based on purposive sampling technique A researcher-made structured questionnaire titled, “AI Proctoring Questionnaire (AIPQ)” was the instrument for data collection. The instrument was structured after Likert modified four-point scale of SA - Strongly Agree (4), A - Agree (3), D - Disagree (2) and SD – Strongly Disagree (1). The reliability test showed a coefficient of 0.84, using split-half reliability technique while Cronbach alpha was used to test the instrument reliability. The data collected were analyzed with descriptive weighted mean statistics at 2.5 criterion mean.

Data Presentation and Analysis

Research Question One: What is the role of automated monitoring as AI examination proctoring tool in higher education institutions in Imo State?

Table 1: Role of Automated Monitoring as AI Examination Proctoring Tool Higher Education Institutions in Imo State

ITEMS	SA	A	D	SD	n	Mean(x)	Decision
Visual movement monitoring	13(52)	13(39)	3(6)	1(1)	30	3.3	Accepted
Audio tracking	24(96)	6(18)	0(0)	0(0)	30	3.8	Accepted
Screen interaction capture	15(60)	15(45)	0(0)	0(0)	30	3.5	Accepted
Keyboard stroke monitoring	10(40)	19(57)	1(2)	0(0)	30	3.3	Accepted
Total Mean						**13.9**	

Weighted average = 13.9/4 = 3.5

Research question one was answered in table 1 with a weighted mean average of 3.5 rated as accepted. This shows automated monitoring as AI examination proctoring tool promotes integrity through. It can achieve this through visual movement monitoring, audio tracking, screen interaction capture and keyboard stroke monitoring.

Research Question Two: What is the role of behavioural analysis as AI examination proctoring tool in higher education institutions in Imo State?

Table 2: Role of Behavioural Analysis as AI Examination Proctoring Tool Higher Education Institutions in Imo State

ITEMS	SA	A	D	SD	n	Mean(x)	Decision
Eye movement detection	27(108)	3(9)	0(0)	0(0)	30	3.9	Accepted
Body movement picking	20(80)	10(30)	0(0)	0(0)	30	3.7	Accepted
Voice tracking	18(72)	12(36)	0(0)	0(0)	30	3.6	Accepted
Facial expression capturing	18(72)	10(30)	2(4)	0(0)	30	3.5	Accepted
Total Mean						**14.7**	

Weighted average = 14.7/4 = 3.7

Table 2 presents data analysis for research question two with a weighted mean average of 3.7, based on which it was concluded that behavioural analysis as AI examination proctoring tool promotes examination integrity. The result shows that this can be possible through eye movement detection, body movement picking, voice tracking and facial expression capturing.

Research Question Three: What is the role of facial recognition as AI examination proctoring tool higher education institutions in Imo State?

Table 3: Role of Facial Recognition as AI Examination Proctoring Tool in Higher Education Institutions in Imo State

ITEMS	SA	A	D	SD	n	Mean(x)	Decision
Face detection	17(68)	13(39)	0(0)	0(0)	30	3.6	Accepted
Facial features extraction	19(76)	11(33)	0(0)	0(0)	30	3.6	Accepted
Facial comparison	15(60)	15(45)	0(0)	0(0)	30	3.5	Accepted
Identity verification	21(84)	9(27)	0(0)	0(0)	30	3.7	Accepted
Total Mean						**14.4**	

Weighted average = 14.4/4 = 3.6

Research question three was answered in table 4 with a weighted mean average of 3.6, which was accepted, indicating that facial recognition as AI examination proctoring tool

facilitates examination integrity. Specifically, this can be done through face detection, facial features extraction, and identity verification.

Discussion of Findings

Analysis of data for research question one indicates that automated monitoring as AI examination proctoring tool promotes examination integrity due to its ability to provide visual movement monitoring, audio tracking, screen interaction capture and keyboard stroke monitoring. This finding resonates with Singh et al. (2024) who reported that AI algorithms provides facial recognition and behavior tracking, which can facilitate integrity. The finding also agrees with Veeramani et al. (2024) who revealed that AI proctor features real-time monitoring, customizable alerts for suspicious activity and achievement of academic integrity.

Result for research question two shows that behavioural analysis as AI proctoring tool brings about examination integrity, particularly through eye movement detection, body movement picking, voice tracking and facial expression capturing. This finding is in line with earlier empirical studies. For instance, Sahu and Kumar (2025) reported that AI-based proctoring promises academic integrity voice detection, behavioral analytics, and anomaly detection using computer vision and machine learning algorithms that promote real-time monitoring. The finding also reinforces Khan and Borse (2024) who stated that AI detects cheating or suspicious behaviours, tracks eye movements, and analyzes background noise and movements as well as suspicious behaviours, such as looking away from the screen frequently, talking, or having other people in the background.

Data analysis for research question three reveals that facial recognition as AI examination proctoring tool facilitates examination integrity, especially through face detection, facial features extraction, and identity verification. This finding supports Sahu and Kumar (2025) who found that AI-based proctoring upholds academic integrity through facial recognition, whereas Khan and Borse (2024) showed that AI monitors students during their tests, to detect cheating or suspicious behaviours through facial recognition that confirms student identities. Result also resonates with Khanna et al. (2021) who observed that the AI proctoring system offers the benefit of face recognition that checks against impersonation or use of machinery.

Conclusion and Recommendations

The study has shown that a significant tool for curbing examination malpractice and ensuring test and exam integrity today is online proctoring, which is facilitated by artificial intelligence (AI). It is a computer-internet-powered tool that follows human operations. The new technology has been used in a number of online or computer-based tests as a tool for checking cheating in exams. This study, based on the analysis of data and comparison of its findings with earlier studies, concludes that AI proctoring is a potent tool for ensuring test score integrity, because it has the potential of capturing students' suspicious behaviours during exams as well as identity swap that promotes impersonation whereby someone more knowledgeable writes exam for another person for pecuniary purposes or other inducements. However, the study finds that AI proctoring has not been adequately utilized in the Nigerian setting due to policy problems, insufficient availability of AI technologies, poor computer culture as well as poor power availability. Based on the foregoing, the following recommendations were made:

- The health education department in higher institutions should adopt automated examination taking and proctoring to fight against cheating and unmerited scores.
- The government should provide schools adequate number of computers and support facilities to fully automate examinations in tertiary institutions.
- The Ministry of Education should closely study the dynamics and challenges of AI proctoring to proffer more effective ways of integrating the technology to ensure test integrity.
- Higher institutions should regularly update and upgrade their AI software to avoid system malfunctions or biased judgments.

REFERENCES

Adie, R. I., & Oko, S. U. (2016). Examination malpractice: Causes, effects and possible ways of curbing the menace. A study of Cross River University of Technology. *International Journal of Managerial Studies and Research (IJMSR), 4*(1), 59-65.

Alessio, H. M., Malay, N., Maurer, K., Bailer, A. J., & Rubin, B. (2017). Examining the effect of proctoring on online test scores. *Online Learning*, *21*(1), 146-161.

Bawarith, R. (2020). Face recognition-based authentication for online exams. *Journal of Intelligent Information Systems, 57*(2), 267-283.

Camerer, C. F. (2017). Artificial intelligence and behavioral economics. In: *Economics of Artificial Intelligence*. University of Chicago Press.

Dadzie, J., & Annan-Brew, R. (2023). Strategies for curbing examination malpractices: Perspectives of teachers and students. *Global Journal of Social Sciences Studies, 9*(1), 1-14.

Daley, S., Pandey, P., & Urwin, M. (2023). *36 Artificial intelligence examples shaking up business across industries*. https://builtin.com/artificialintelligence/ examples-ai-in-industry

Dendir, S., & Maxwell, R. S. (2020). Cheating in online courses: Evidence from online proctoring. *Computers in Human Behavior Reports 2*. https://doi.org/10.1016/j.chbr.2020.100033.

Fask, A., England, L., & Sottile, J. (2014). Assessing the effectiveness of online proctoring in maintaining academic integrity. *Journal of Online Learning and Teaching*, *10*(2), 242-254.

Fetsch, T. (2020). *Online exam supervision: Live proctoring vs. automated proctoring.* OEB Learning Technologies Europe GmbH, September 18. https://oeb.global/oebinsights/ online-exam-supervision-live-proctoring-vs-automated-proctoring/

Flieller, A. (2016). The role of artificial intelligence in online proctoring. *Journal of Educational Technology Development and Exchange, 8*(1), 1-16.

Fliotska, O., & Diatel, O. (2020). AI-powered proctoring: A new era in online education. *International Journal of Emerging Technologies in Learning, 15*(10), 137-147.

Gomba, C. (2023). Academic dishonesty, a cancer devouring academia: A Case study of academic dishonesty at two Zimbabwean Universities. *The Fountain: Journal of Interdisciplinary Studies, 7*(1), 163-186.

Guizzo, E. (2014). *How Aldebaran robotics built its friendly humanoid robot, pepper. IEEE Spectrum.* Available: https://spectrum.ieee.org/robotics/homerobots/how-aldebaran-robotics. Accessed: 15 June 2018.

Harper, R., Bretag, T., & Sadiq, S. (2020). Using artificial intelligence to detect contract cheating in online exams. *Assessment & Evaluation in Higher Education, 45*(5), 661-673.

Hussein, M. J., Yusuf, J., Deb, A. S., Fong, L., & Naidu, S. (2020). An evaluation of online proctoring tools. *Open Praxis, 12*(4), 509-525.

Khan, A., & Borse, V. (2024). Exam proctoring AI. *International Journal of Creative Research Thoughts (IJCRT), 12*(6), a523 - a529.

Khan, S. I. (2020). AI-based online proctoring: A systematic review. *Computers in Human Behavior,* 112, 106478.

Khanna, V., Brodiya, S. & Chaudhary, D. (2021). Artificial intelligence based automated exam proctoring system. *International Research Journal of Engineering and Technology (IRJET), 8*(12), 558-560.

King. A. (2022). *What are cyber-physical systems?* RMIT University.

Koch, R. (2022). *Benefits of Artificial Intelligence: How it contributes to our society and economy*. https://www.clickworker/customerblog/benefits-of-ai/

Kovač, V. B., Nome, D. Ø., Jensen, A. R., & Skreland, L. L. (2023). The why, what and how of deep learning: Critical analysis and additional concerns. *Education Inquiry,* 1-17.

Kühl, N., Mühlthaler, M., & Goutier, M. (2018). *Automatically quantifying customer need tweets : Towards a supervised machine learning approach* Hawaii: BT.

LeCun, Y. A., Bengio, Y., & Hinton, G. E. (2015). *Deep learning*. *Nature*.

Lohr, S. (2016). *IBM is counting on its bet on Watson, and paying big money for it*. New York: New York Times.

Okunloye, R. W., Balogun, I. N., & Oladele, J. I. (2019). Teachers' perception on use of values clarification strategy for curbing examination malpractice in Upper-Basic schools in Ilorin Metropolis. *Anatolian Journal of Education, 4*(2), 10-18.

Oladele, J. I., Ndlovu, M., & Spangenberg, E. D. (2023). Application of 4IR for steam education in higher education and implications for developing countries: A systematic review. *Journal of Research and Reviews in Social Sciences Pakistan, 6*(2), 2162-2181.

Orhani, S. (2023). Robots assist or replace teachers in the classroom. *Journal of Elementary and Secondary School, 1*(1), 5.

Prathish, S. Narayanan, S. A. & Bijlani, K. (2016). An intelligent system for online exam monitoring. *Proceedings of the 2016 International Conference on Information Science (ICIS)* (pp. 138-143), 12-13. Kochi, India: IEEE.

Raja, R., & Nagasubramani, P. C. (2018). Impact of modern technology in education. *Journal of Applied and Advanced Research, 3*(1), 33-35.

Sahu, P. K., & Kumar, V. (2025). AI-Based proctoring system for online tests. *International Journal of Research Publication and Reviews, 6*(4), 12939-12946.

Saleh, Z. (2019). *Artificial intelligence definition, ethics and standards.* The British University in Egypt.

Singh, A., Singh, A., & Yadav, V. S. (2024). Artificial intelligence for examinations: A perspective. *YMER, 3*(23), 801-809.

Skshidlevsky, A. (2022). *Academic dishonesty statistics.* ProctorEdu. https://proctoredu.com/blog/tpost/5dk67zrns1-academic-dishonesty-statistics

Udim, D. K., Abubakar, U., & Essien, J. O. (2018). An indepth evaluation on the issue of examination malpractice in Nigeria. *Research in Pedagogy, 8*(2), 204-213.

Veeramani, T., Tharun, T., Krishna, S., Kumar, T., & Prasad, L. (2024). Online exam proctoring system based on artificial intelligence. *International Journal of Novel Research and Development, 9*(4), c504 – e511.

Watson, G., & Sottile, J. (2018). Student perceptions of online proctoring: A mixed-methods study. *Online Journal of Distance Learning Administration, 21*(2), 1-15.

Weiner, J. A., & Hurtz, G. M. (2017). Comparison of online proctoring methods: A review of the literature. *Journal of Educational Technology Development and Exchange*, *9*(1), 1-20.

Weiner, R. (2018). AI proctoring: A review of the literature. *Journal of Educational Computing Research*, *56*(4), 419-435.

Yamuna, P., Reddy, P. V., Praneeth, K. S., Akhil, U., & Chandu, S. (2023). Online exam proctoring system using machine language. *International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)*, *3*(5), 315-321.