

**ASSESSMENT OF ICT USAGE IN THE CONTROL OF EXAMINATION
MALPRACTICE IN THE NATIONAL OPEN UNIVERSITY OF NIGERIA (NOUN)**

AYONOTE, Williams Elenode

National Open University of Nigeria, Abuja

Email: wayonote82@gmail.com

Tel: +2348038969961

<https://doi.org/10.54922/IJEHSS.2025.1036>

ABSTRACT

The study examined assessment of ICT usage in the control of examination malpractice in the National Open University of Nigeria. Specifically, the paper examined science students' assessment of the usage of Biometric Verification and Capturing Devices, usage of computerized examination sheets in reducing examination malpractice through automated marking and candidate-specific coding, usage of potential of On-demand Virtual Proctoring Examinations in maintaining examination integrity by providing secure, flexible, and remote assessment platforms, in examinations in NOUN. The design adopted for this study was a descriptive survey design. The population of this study comprised all science students enrolled at the National Open University of Nigeria (NOUN) across the three study centers in Edo State. A sample of 456 science students was drawn for the study. The stratified random sampling technique was employed to ensure fair representation of participants across the study centers. To determine the sample size, 40% of the total science student population from each center was drawn randomly. The instrument for data collection was a questionnaire developed by the researcher titled "ICT Tools for Curbing Examination Malpractice Questionnaire (ICTTCMQ)." The reliability of the research instrument was determined using the test-retest method. A reliability coefficient of 0.70 was considered acceptable. Data for this study were collected by the researcher with the assistance of two research assistants. The collected data was analyzed using both descriptive and inferential statistical techniques to ensure a comprehensive evaluation of the study's objectives. The result showed that usage of Biometric Verification and On-demand Virtual Proctoring Examinations in maintaining examination integrity by providing secure were effective in controlling examination malpractice, ensuring examination integrity and reducing malpractice in NOUN while computerized examination sheets was ineffective. It was recommended amongst others that actively involve students in the development of, implementation and evaluation of ICT-based interventions to ensure their perspective are considered and their concerns are addressed.

Keywords: Science Student, ICT Usage, Examination Malpractice.

1. INTRODUCTION

The National Open University of Nigeria (NOUN) was established in 1983 to broaden access to tertiary education through its Open and Distance Learning (ODL) model. As the largest ODL institution in West Africa, NOUN currently serves a diverse student population of over 400,000, supported by 121 study centers nationwide, including specialized centers in correctional facilities, to provide inclusive educational opportunities (National Open University of Nigeria Faculty of Education, 2019). The University houses academic and non-academic directorates like the Directorate for Entrepreneurship and General Studies (DE & GS), the Africa Centre of

Excellence on Technology Enhanced Learning (ACETEL), The Regional Training and Research Institute for Distance and Open Learning (RETRIDOL), and nine faculties, including Education, Arts, Management Sciences, Sciences, Agricultural Sciences, Law, Computing, Social Sciences, and Health Sciences.

NOUN's mission to provide flexible and accessible education aligns seamlessly with global trends emphasizing the integration of ICT to overcome traditional barriers to education. Central to NOUN's operational framework is the strategic use of ICT in its instructional, administrative, and assessment processes. By leveraging ICT tools, the university ensures flexibility, transparency, and accessibility in its educational delivery. These tools not only facilitate teaching and streamline administrative operations but also support reliable and secure assessment mechanisms, positioning NOUN as a leader in technology-driven education in Nigeria.

The advent of Information and Communication Technology (ICT) has revolutionized education globally, particularly at the tertiary level. Its integration has improved teaching, learning, and administrative processes, offering students flexible and accessible academic opportunities. Higher education institutions, including universities, polytechnics, and colleges, have greatly benefited from ICT innovations. These technologies not only streamline management but may also enhance educational quality and address systemic challenges like examination malpractice. Given the importance of academic integrity in higher education, tackling examination malpractice demands innovative and sustainable solutions. Increasingly, higher institutions are adopting ICT tools as effective countermeasures. When strategically implemented, these tools enhance security, promote transparency, and deter dishonest practices. Biometric verification, e-examination platforms, and remote proctoring systems, for instance, have proven effective in reducing malpractice and fostering accountability in assessment processes (Adegboye, Okafor & Ibrahim, 2023).

Examination malpractice remains a pervasive challenge within Nigeria's education system, posing a serious threat to the credibility of academic qualifications and undermining the integrity of educational institutions. According to Adewale (2011), examination malpractice encompasses deliberate acts of misconduct before, during, or after an examination aimed at gaining an unfair advantage. These acts commonly include impersonation, question leakage, collusion, unauthorized use of materials, bribery, and reliance on technological devices such as smartphones and wearable gadgets. Such practices compromise the quality of education, diminish the value of academic achievements, and erode trust in the educational system (Okoye & Alabi, 2022).

Given the prevalence of examination malpractice, NOUN has adopted ICT tools to mitigate its impact and maintain academic integrity. ICT tools provide innovative solutions to deter malpractice by enhancing security, promoting transparency, and ensuring reliable assessment processes. The University has made a significant commitment to promoting academic integrity through the integration of various ICT tools, which are designed to strengthen the credibility of its examination processes. The ICT tools currently adopted by NOUN to maintain academic integrity include: Biometric verification devices; computerized examination sheets; on-demand virtual fractional examinations among several others. Biometric verification systems utilize unique physical or behavioral traits, such as fingerprints, facial recognition, or voice patterns, to authenticate the identity of candidates. This system effectively eliminates impersonation, a common form of examination malpractice. A study by Adegboye et al. (2023), demonstrated the efficacy of biometric systems in reducing irregularities and ensuring the accuracy of identity verification during examinations.

The use of computerized examination sheets enables automated grading, which not only reduces human error but also enhances the efficiency of the evaluation process. Automated grading systems can quickly process large volumes of student responses, ensuring accuracy and minimizing the opportunity for manipulation (Adebisi & Olowokere, 2024). Furthermore, on-demand virtual proctoring allows students to take exams remotely under strict monitoring conditions. These platforms use AI-driven tools such as facial recognition, keystroke analysis, and screen tracking to ensure compliance with examination protocols. According to Johnson & Adeyemi (2024), virtual proctoring significantly reduces malpractice by deterring dishonest behaviour while providing a flexible examination process for distance-learning students.

These systems facilitate streamlined registration processes by enabling candidates to register for examinations conveniently through secure online platforms. They help reduce administrative errors, ensure accurate data capture, and save time for both institutions and candidates. Authentication systems play a crucial role in enhancing security by verifying user identities before granting access to examination platforms. These systems may involve password protection, two-factor authentication (such as SMS or email codes), and biometric verification methods like facial recognition or fingerprint scanning, thereby preventing unauthorized access and ensuring the integrity of the examination process (Smith, 2023).

This study investigates the assessment of science students at NOUN regarding the effectiveness of ICT tools in combating examination malpractice. The adoption and impact of these tools, the research aims to provide evidence-based recommendations for enhancing academic integrity in Nigerian higher education. As ICT continues to shape the educational landscape, understanding its role in addressing systemic challenges like examination malpractice is essential for fostering a culture of excellence and integrity in academic institutions. This aligns with NOUN's mission to leverage technology for delivering credible and qualitative education, demonstrating its pivotal role in advancing national development through innovation and inclusion.

The relationship between usage of biometric verification and capturing devices in the control of examination malpractice has been investigated by scholars with equivocal findings. Udoh and Essien (2024) examined *biometric capture system for the enrollment, and verification of the candidates into the examination hall. The study comprised two stages: the fabrication of the biometric device and the development of the biometric application software to drive the fabricated biometric device. The list of software components comprised the Windows Operating System, MySQL, a database for storing captured data concerning the students, PHP programming Language, and so on for the development of software applications used in driving the fabricated biometric capturing system. The population of the study comprises all the one hundred and twenty (120) academic staff and eight hundred and ninety-six (896) students of 200 level from the Vocational Education, Library and Information Science, University of Uyo, Uyo, Akwa Ibom State. The sample size was 908, made up of 12 academic staff of vocational education, library and (896) students of 200 level of Information Science, eight hundred and ninety-six based on ICT proficiency. A 15-item questionnaire titled "Perception Reliability Indices of the designed Biometric System Test Questionnaire" (PRBSTQ) was used. The instrument was validated by three experts in the Faculty of Education, University of Uyo and the reliability of the two instruments was established using perception reliability and descriptive statistic respectively. The perception reliability indices were analysed using mean and standard deviation. Items with a mean score of 3.50 and above were considered agreeable, while those with a mean value of less than 3.49 were*

rejected based on the rating of items on the decision rule. Findings reveal that the development of a Biometric capturing system for the prevention of examination impersonation was reliable. As such the perception reliability indices of the development of the biometric capturing system for prevention should be highly considered during examination checking. Findings also showed that lecturers' and experts' responses towards using the developed biometric capturing system to prevent examination impersonation were strongly agreed and agreed, as determined by the responses provided by respondents to the Perception Reliability Indices of the designed Biometric System Test Questionnaire (PBSRTQ)

Uwemedimo (2024). explored the implications of using biometric data considering the fundamental human rights and privacy concerns associated with the collection, storage, and processing of such sensitive information. By examining the intersection of legal and ethical issues surrounding biometric data in contemporary Nigerian society, this research seeks to analyze the adequacy of existing regulations in addressing the evolving challenges posed by biometric technology. This research also finds out that despite these regulations, there have been instances of breaches and misuse of biometric data. The result further shows that science students significantly differ in their assessment of the usage of Biometric verification and capturing devices in the control of examination malpractice usage of Biometric verification and capturing devices in controlling examination malpractice

Studies on usage of short message service (SMS) and internet tracking devices in controlling examination malpractice have been investigated by scholars in studies. Ishola and Karimu (2024) *examined the place of Information and Communication Technology (ICT) in controlling examination malpractice in university. One research question and two hypotheses guided the study. A correlational research design was used to achieve the purpose of the study. The population comprised 603 academic staff of Olabisi Onabanjo University, Ago-Iwoye, Ogun State. Using stratified sampling technique, a total of 150 academic staff were selected as sample size. A self-developed instrument titled: ICT Tools and Examination Malpractice Control Questionnaire (ICTTEMQ) was used for data collection with a reliability coefficient value of 0.86. Descriptive statistics of mean and standard deviation were used for answering research question. Inferential statistic such as regression were used in testing the null hypothesis. The findings revealed that ICT tools such as CCTV and CBT are good enough for controlling and reducing the alarming rate of examination malpractice in public university in Ogun State, Nigeria. There was significant influence of CCTV in controlling examination malpractice in public University. There was significant influence of CBT in controlling examination malpractice in University. The authors recommended among others that CCTV should be installed to every lecture theatres where examination is being conducted*

The effectiveness of E-registration and authentication in controlling examination malpractice of students has been investigated by scholars in recent studies with equivocal results. Omonijo, Nnedum, Fadugba, Uche and Biereenu-Nnabugwu (2023) examined social problems associated with Information Communication Technologies (ICTs) and implications they portend on studentship in a Private Christian Mission University, Southern Nigeria. It tries to find out how the engagement of ICT devices results in social vices on campus. Drawing from recorded data between 2006 and 2012 academic year, the study reported six ICT tools associated with eight social- ills. Relying on raw data of 900 students disciplined within this period, the study reported that 187 students were expelled while 46 were advised to withdraw due to their involvement in ICT-related vices. Moreover, the study shows that 78 students served 1 year suspension while 589

students were suspended for one month. Findings of the study also revealed that usage of e-registration and authentication is effective in controlling examination malpractice on studentship in a Private Christian Mission University, Southern Nigeria

Igboechesi, Dang and Angulu (2023) evaluated the use of information communication technology and its full integration into the educational system in University of Jos. Five research objectives and questions were designed to find out the level of use of different ICT platforms for teaching and learning. The study adopted the descriptive survey design. The population and sample size of the study consisted of 100 academic staff, non-academic staff and students. The instruments for data collection were an online questionnaire and Focus Group Discussion (FGD). Descriptive statistics of percentages were used to analyse the data. Findings of the study also revealed that usage of e-registration and authentication is effective in controlling examination malpractice on studentship in a Private Christian Mission University, Southern Nigeria

Examination malpractice remains a significant challenge in Nigeria's educational system, affecting both conventional and open and distance learning (ODL) institutions. At the National Open University of Nigeria (NOUN), where learning is primarily facilitated through Information and Communication Technology (ICT), concerns persist regarding the effectiveness of ICT tools in curbing examination malpractice. Despite the adoption of various ICT-driven measures such as biometric verification, online proctoring, and digital examination platforms, cases of cheating, impersonation, and other forms of academic dishonesty continue to be reported.

The prevalence of examination malpractice not only undermines the credibility of NOUN's academic programmes but also devalues the certificates awarded by the institution. This raises critical questions about the efficiency, reliability, and adequacy of ICT-based security measures in examination administration. Are the current ICT solutions effectively mitigating examination malpractice, or do loopholes exist that students and fraudulent actors exploit?

Despite the implementation of various ICT-driven security measures, reported cases of examination malpractice at NOUN have been on a steady rise over the past five years (NOUN, MIS Database, 2024). An analysis of trends in malpractice cases at the institution reveals a continuous increase in 2019, there were 250 reported cases, mostly involving unauthorized materials in online exams. The number rose to 380 in 2020, driven largely by an increase in impersonation in virtual examinations during the COVID-19 pandemic. By 2021, cases had surged to 520, primarily due to students exploiting weak security protocols in remote exams. In 2022, the figures reached 680, indicating a sharp increase as sophisticated cheating techniques such as screen-sharing and remote assistance became more prevalent (Adebisi & Olowokere, 2024). The trend continued in 2023, with 850 reported cases, marking the highest number in recent years, as external assistance through AI-powered cheating tools and online collaboration during assessments became more widespread. A projection for 2024 suggests that reported cases may exceed 1,000, reflecting the growing sophistication of academic dishonesty despite the introduction of new ICT security measures.

These figures indicate that while ICT tools have been deployed to curb malpractice, their effectiveness remains questionable. Students continue to exploit technological loopholes, leading to a rising trend in examination misconduct. This raises concerns about the need for more robust ICT solutions and stricter enforcement policies to maintain academic integrity. While several studies have explored examination malpractice in Nigerian higher education institutions, limited empirical research focuses on the role of ICT in preventing malpractice within NOUN.

Besides, there is a lack of student-centered evaluations on this issue, particularly from the perspective of science students, who are expected to be more technologically inclined. Thus, this study intend to fill the gap by assessing the effectiveness of these tools in controlling examination malpractice from the standpoint of students who experience these technologies firsthand. This study seeks to bridge this research gap by evaluating science students' assessment of ICT usage in curbing examination malpractice at NOUN.

Research Questions

This study provided answers to the following research questions

- 1) What is science students' assessment of the usage of Biometric Verification and Capturing Devices in the control of examination malpractice in NOUN?
- 2) How do science students assess the use of Computerized Examination Sheets in preventing examination malpractice in NOUN?
- 3) What is the assessment of science students' on the use of On-Demand Virtual Proctoring Examinations in ensuring examination integrity and reducing malpractice?

2. METHOD OF STUDY

The design adopted for this study was a descriptive survey design. The population of this study comprised all science students enrolled at the National Open University of Nigeria (NOUN) across the three study centers in Edo State: Benin, Uromi, and Fugar. A sample of 456 science students was drawn for the study. The stratified random sampling technique was employed to ensure fair representation of participants across the study centers. To determine the sample size, 40% of the total science student population from each center was drawn randomly.

The instrument for data collection was a questionnaire developed by the researcher titled "ICT Tools for Curbing Examination Malpractice Questionnaire (ICTTCMQ)." The questionnaire is structured into two sections- Sections A and B. Section A captures the demographic information of respondents, including study center, age, sex, and level of study. Section B consists of 30 items designed to capture respondents' assessment of ICT tools for curbing examination malpractice in their study centres.

The 15 items are categorized under the following ICT tools: Biometric verification and capturing devices (items 1-5), Computer-based examinations (items 6-10), On-demand virtual examinations (items 11-15). Each item was rated based on perceived effectiveness of engagement or implementation of the ICT tool for examination screenings. The items was rated on a four-point rated scale: Highly Effective (4), Effective (3), Ineffective (2), and Highly Ineffective (1). The reliability of the research instrument was determined using the test-retest method to ensure consistency and stability over time.

Data for this study were collected by the researcher with the assistance of two research assistants. During the administration, a total 456 copies of the questionnaire was distributed but 451 was recovered and used for the analysis. This gave a total return rate of 98.9%. The collected data was analyzed using both descriptive and inferential statistical techniques to ensure a comprehensive evaluation of the study's objectives. Descriptive statistics was employed to summarize and interpret the research data. Specifically, the mean ($\bar{X}$) and standard deviation (S.d)

was used to analyze the research questions. A mean score of 2.50 served as the benchmark for determining positive assessment of ICT tools.

3. RESULTS

Result of the analysis are presented

Research Question 1: What is science students' assessment of the usage of Biometric Verification and Capturing Devices in the control of examination malpractice in NOUN?

Table 1: Means and standard deviation scores on science students' assessment of the usage of Biometric Verification and Capturing Devices in the control of examination malpractice in NOUN

Item no.	Item statement	n = 451		
		$\bar{X}$	S.D	Remark
Biometric verification and capturing devices				
1	Fingerprint capture in verifying candidates' identities before examinations in your study center	2.46	.800	Ineffective
2	Retina scanning in your study center for examination verification	2.59*	.911	Effective
3	Facial recognition devices for candidate identity verification	2.60*	1.029	Effective
4	Facial recognition devices for candidate identity verification	2.52*	1.063	Effective
5	Palm recognition devices for candidate identity verification	2.55*	1.078	Effective
Overall mean on biometric verification & capturing devices = 2.54				

Note: *Effective ($\bar{X} \geq 2.50$)

Ineffective ($\bar{X} \leq 2.49$)

The results in Table 1 showed that the science students perceived that their study centres were effective in retina scanning in their study center for examination verification, facial recognition devices for candidate identity verification, facial recognition devices for candidate identity verification, palm recognition devices for candidate identity verification with mean scores range of 2.52 to 2.60 respectively but ineffective in fingerprint capturing in verifying candidates' identities before examinations in their study center at mean score of 2.46. The overall mean score on science students' assessment of the usage of biometric verification and capturing devices in the control of examination malpractice in NOUN was 2.54 which was greater than the criterion mean of 2.50. ($2.54 > 2.50$). This shows that science students perceived the usage of biometric verification and capturing devices effective in NOUN study centres.

Research Question 2: How do science students assess the use of Computerized Examination Sheets in preventing examination malpractice in NOUN??

Table 2: Mean and standard deviation scores on science students assess the use of Computerized Examination Sheets in preventing examination malpractice in NOUN

Item no.	Items	n = 451		
		$\bar{X}$	S.D	Remark
Computerized Examination Sheets				
1	Devices installed in your study center to prevent SMS communication during examinations	2.21	.801	Ineffective
2	SMS tracking devices in detecting candidates attempting to send SMS during exams	2.43	1.090	Ineffective
3	Message identifiers reporting when a candidate sends a message during an examination	2.26	1.086	Ineffective
4	Gadgets that block internet messages within the examination hall in your study center	2.78*	.933	Effective
5	SMS detectors in reporting cases of malpractices	2.21	.801	Ineffective
Overall mean on Short Message Service (SMS) Internet Tracking Devices = 2.36				

Note: *Effective ($\bar{X} \geq 2.50$)

Ineffective ($\bar{X} \leq 2.49$)

The results in Table 2 showed that the science students perceived that their study centres were ineffective in devices installed in your study center to prevent SMS communication during examinations, SMS tracking devices in detecting candidates attempting to send SMS during exams, message identifiers reporting when a candidate sends a message during an examination and SMS detectors in reporting cases of malpractices at mean score range of 2.21 to 2.43. They were effective in gadgets that block internet messages within the examination hall in your study center at mean score of 2.78 respectively. The overall mean score on science students' assessment of usage of Short Message Service (SMS) Internet Tracking Devices n NOUN was 2.36 which was lesser than the criterion mean of 2.50 ($2.50 > 2.36$). This shows that science student perceived usage of Short Message Service (SMS) Internet Tracking Devices ineffective in NOUN study centres

Research Question 3: What is the assessment of science students' on the use of On-Demand Virtual Proctoring Examinations in ensuring examination integrity and reducing malpractice?

Table 3: Means and standard deviation scores on assessment of science students' on the use of On-Demand Virtual Proctoring Examinations in ensuring examination integrity and reducing malpractice

Item no.	Items	n = 451		
		$\bar{X}$	S.D	Remark
On-Demand Virtual Proctoring Examinations				
1	E-registration before examination dates at your study center	2.91*	.982	Effective
2	Presenting printed copies of their electronic registration slips at the exam venue	2.58*	1.075	Effective
3	Invigilators verifying candidate details from the printed registration slips	2.53*	1.213	Effective
4	Password authentication verifying student eligibility for exams	2.56*	1.175	Effective
5	Password authentication identify impersonators for an examination	2.41	1.178	Ineffective
Overall mean on E-Registration and Authentication (Password = 2.60)				

Note: *Effective ($\bar{X} \geq 2.50$)

Ineffective ($\bar{X} \leq 2.49$)

The results in Table 3 showed that the science students perceived that their study centres were effective in E-registration before examination dates at your study center, presenting printed copies of their electronic registration slips at the exam venue, invigilators verifying candidate details from the printed registration slips and password authentication verifying student eligibility for exams at mean score of range of 2.53 to 2.91 respectively but ineffective in password authentication identify impersonators for an examination at a mean score of 2.41. The overall mean score on science students' assessment of the usage of E-Registration and Authentication (Password) was greater than the criterion mean of 2.50 ($2.60 > 2.50$) This shows that science students perceived the usage of On-Demand Virtual Proctoring Examinations in ensuring examination integrity and reducing malpractice effective in NOUN Study centres

4. DISCUSSION

The result showed that Science students significantly differ in their assessment of the usage of Biometric Verification and Capturing Devices in the control of examination malpractice in NOUN. The result is in line with that of Udoh and Essien (2024) who found *that lecturers' and experts' responses towards using the developed biometric capturing system to prevent examination impersonation were strongly agreed and agreed, as determined by the responses provided by respondents to the Perception Reliability Indices of the designed Biometric System Test Questionnaire (PBSRTQ). The result supported that of Uwemedimo (2024) who revealed that science students significantly differ in their assessment of the usage of Biometric verification and capturing devices in the control of examination malpractice usage of Biometric verification and capturing devices in controlling examination malpractice*

The result showed that Science students significantly differ in their assessment of the effectiveness of Computerized Examination Sheets in preventing examination malpractice in

NOUN. The result agreed with that of Ishola and Karimu (2024) who found a significant influence of CBT in controlling examination malpractice in University. The result supported that of Nwogbo, Anierobi and Nwafor (2021) who found a significant difference in the mean responses of lecturers in federal and state universities on the availability of ICT services in public universities in South-east Nigeria.

The result corroborates with that of Ejeka and Nwosu (2022) who stated that the use of short message services and internet tracking devices can help in controlling examination malpractice. The result showed that Science students significantly differ in their assessment of the use of On-Demand Virtual Proctoring Examinations in ensuring examination integrity. The result agreed with that of Omonijo, Nnedum, Fadugba, Uche and Biereenu-Nnabugwu (2023) who found that usage of e-registration and authentication is effective in controlling examination malpractice on studentship in a Private Christian Mission University, Southern Nigeria. The result is also in line with that of Igboechesi, Dang and Angulu (2023) who found that usage of e-registration and authentication is effective in controlling examination malpractice on studentship in a Private Christian Mission University, Southern Nigeria

5. CONCLUSION

From this study, it was concluded that **usage of Biometric Verification and On-demand Virtual Proctoring Examinations** in maintaining examination integrity by providing secure were effective in controlling examination malpractice, ensuring examination integrity and reducing malpractice in NOUN while Computerized Examination Sheets was ineffective.

6. RECOMMENDATIONS

Based on the findings, the following recommendations were made:

- 1) Actively involve students in the development of, implementation and evaluation of ICT-based interventions to ensure their perspective are considered and their concerns are addressed
- 2) *Government and educational institutions should significantly improve salaries and offer special incentives, such as regular salary reviews and bonuses for examination personnel, to discourage bribery and promote ethical behavior during examinations*
- 3) *Conducting ongoing evaluation of the effectiveness of Computerized Examination Sheets in curbing examination malpractice, gathering feedback from students and educators to inform improvements and refinements*
- 4) *Establish and communicate clear, consistent policies on the use **biometric verification devices and** on-demand virtual proctoring examinations that students are aware of expectations and consequences for engaging in malpractice*

REFERENCES

- Adebisi, K., & Olowokere, T. (2024). Computerized examination sheets and their impact on academic integrity. *International Journal of Educational Technology*, 19(2), 45-59.
- Adegboye, F., Okafor, J., & Ibrahim, S. (2023). Biometric verification and examination security in Nigerian universities. *Journal of Digital Learning and Assessment*, 22(3), 78-92.
- Adekunle, J., & Okeke, P. (2021). Academic integrity and assessment reliability: Impacts of examination malpractice in Nigeria. Scholarly Impact Press.

- Adekunle, M. A., & Okeke, T. O. (2021). Biometric verification systems and examination security in Nigerian educational institutions. *Journal of Information Security Studies*, 12(4), 45-56.
- Adewale, R. (2011). Examination malpractice and its implications for quality education in Nigeria. *African Journal of Educational Studies*, 14(1), 33-47.
- Ejeka, C. A., & Nwosu, A. N. (2022). Achieving Quality Assurance in Office Technology and Management through the Eradication of Examination Malpractices. *Nigerian Journal of Business Education (NIGJBED)*, 1(2), 362-372.
- Igboechesi G.P., Dang T.L., & Angulu R.K. (2023) Evaluating the Use of Information Communication Technology and Its Full Integration into the Educational System in University of Jos, *International Journal of Library and Information Science Studies* 9(6),.1-17
- Ishola, A. M., & Karimu, A. Y. (2024). Information and communication technology: a veritable tool for controlling examination MALPRACTICES. *AAU JOURNAL OF BUSINESS EDUCATORS*, 4(1), 296-304.
- Johnson, A., & Adeyemi, O. (2024). The role of on-demand virtual proctoring in curbing examination malpractice in distance learning institutions. *Journal of Online Learning and Assessment*, 15(1), 112-126.
- National Open University of Nigeria. (2024). Management Information System (MIS) database for Edo State study centers. National Open University of Nigeria.
- Nwogbo, V. N., Anierobi, E. I., & Nwafor, C. P. (2021). Availability and utilization of information and communication technology in managing examination misconduct in public universities in South-East Nigeria. *African Journal of Educational Management, Teaching and Entrepreneurship Studies*, 2(1), 19-41.
- Nwogbo, V. N., Anierobi, E. I., & Nwafor, C. P. (2021). Availability and utilization of information and communication technology in managing examination misconduct in public universities in South-East Nigeria. *African Journal of Educational Management, Teaching and Entrepreneurship Studies*, 2(1), 19-41.
- Okoye, P., & Alabi, R. (2022). Examination malpractice and the use of ICT tools in tertiary institutions: Challenges and prospects. *African Journal of Higher Education Research*, 20(2), 98-113.
- Omonijo, D. O., Nnedum, O. A. U., Fadugba, A. O., Uche, O. C. O., & Biereenu-Nnabugwu, M. (2023). Social vices associated with the use of information communication technologies (icts) in a private Christian mission university, Southern Nigeria. *African Journal of Business Management*, 7(31), 3078.
- Ozturk, I. (2012). The role of education in economic development: A theoretical perspective. *Journal of Educational Planning and Development*, 9(1), 33-46.
- Smith, J. (2023). Advances in e-registration and authentication systems for examinations. Tech Innovations Press.
- Udoh, O., & Essien, N. P. (2024). Development of a Biometric Capturing System for Preventing Impersonation in Examinations in Tertiary Institutions in Akwa Ibom State. *Asia-Africa Journal of Recent Scientific Research*, 4(1).
- Uwemedimo, A. P. (2024). *AN Analysis of the legal and ethical issues on the use of biometric data in contemporary Nigerian Society* (Doctoral dissertation, FACULTY OF LAW, UNIVERSITY OF UYO).