

INFORMATION AND COMMUNICATION TECHNOLOGY UTILIZATION AND EXAMINATION INTEGRITY: EVIDENCE FROM THE NATIONAL OPEN UNIVERSITY OF NIGERIA

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Abstract

The study investigated the effectiveness of Information and Communication Technology (ICT) tools in controlling examination malpractice at the National Open University of Nigeria (NOUN). Specifically, the study examined the use of Short Message Service (SMS) and Internet tracking devices in detecting and preventing examination malpractice; Closed-Circuit Television (CCTV) surveillance in deterring and identifying examination malpractice; and the use of E-Registration and Authentication Systems in ensuring that only eligible students participate in examinations at NOUN. A descriptive survey design was adopted to achieve the central purpose of the study. The population of this study comprised all science students enrolled at the 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 adequate representation of participants across the study centers. The instrument for data collection was a questionnaire developed by the authors, titled ICT Tools for Curbing Examination Malpractice Questionnaire. Reliability of the instrument was determined using the test-retest. Data were collected by the authors with the help of two research assistants. The descriptive and inferential statistics was used to ensure a comprehensive analyses of the data collection. The result showed that science students significantly differ in their usage of Short Message Service (SMS) and Internet tracking devices in detecting and preventing exam malpractice, Closed-Circuit Television (CCTV) surveillance in deterring and identifying examination malpractice, and the use of E-Registration and Authentication Systems in ensuring only eligible students participate in examinations in NOUN. It was recommended, amongst others, that to actively involve students in the development, implementation, and evaluation of ICT-based interventions to ensure their perspectives are considered and their concerns are addressed.

Keywords: Examination Malpractice, ICT Usage, National Open University of Nigeria, Science Students.

Introduction

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 et al., 2023).

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.

The National Open University of Nigeria'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.

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: SMS and internet tracking devices; close circuit television station and authentication system; Others include biometric verification and capturing devices, on-demand virtual fractional examinations and short message servicing and internet hardware device.

SMS and internet tracking devices are instrumental in monitoring and blocking unauthorized communication during examinations. These tools reduce the opportunities for cheating and question leakage, ensuring that examinations are conducted in a secure and transparent manner (Okoye & Alabi, 2022). The close-circuit television (CCTV) surveillance plays a vital role in monitoring examination venues in real time, providing a secure environment for conducting examinations. These systems help deter dishonest practices such as cheating, impersonation, and bribery by creating a constant visual presence that fosters accountability among both students and invigilators. The recorded footage serves as evidence for resolving disputes or investigating reported incidents during examinations. Advanced CCTV systems come with features such as motion detection, facial recognition, and remote monitoring, which enhance their effectiveness in ensuring examination integrity (Okoye & Alabi, 2022).

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.

Studies on usage of CCTV in controlling examination malpractice have been investigated in recent times by different scholars. Solomon (2022) reported that the current Malawi National Examinations Board (MANEB) processes have a number of challenges, that is. missing entries, wrongly captured details, difficult to read verification sheets, time consuming, delayed examinations results, theft of examinations fees by schools' authorities etcetera. Their study also showed that the use of CCTV enhances the control of examination malpractice in MANEB. Eziechina, Ugboaja and Esiagu (2017) reported that with CCTV, incidences of examination malpractice during exam will be drastically reduced as it has the capacity to ensure that examinations are properly monitored and recorded, serve as deterrence to potential offenders, and provide footage evidence to prove that a malpractice occurred or not. Manyo and Oben (2025) found that the use of CCTV by school management in the conduct of semester examination in universities and utilization of Closed-Circuit Television System in the management of institutional facilities in universities were not effective to yield the expected result. Isabu and Asemhokhai (2025) reported that computer-based examination was not effective in controlling examination malpractice among students, computer-based examination was not effective in managing examination malpractice among students and Computer-based examination (CBE) was effective in managing the accuracy in students grading.

Furthermore, Umar, Sani and Nura (2022) found that Computer based was effective in controlling examination malpractice among student Katsina State Institute of Technology and Management (KSITM). Karimu (2024) found 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. The study also revealed that 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. Nwogbo, Anierobi and Nwafor (2021) found that usage of short message services (SMS) and internet tracking devices can be used in controlling examination malpractice in public universities in South-east Nigeria. The study also found that CBT can be used in managing aspects of examination misconduct such as: curtailing exchange of answer sheets, eliminate snatching of question papers and taking away of answer scripts from the examination halls during examination. Their result also showed that CBT can be utilized to reduce manipulation of students' scores by lectures after examination and reduce access to examination questions before the examination. The study also found out that there is 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

Examination malpractice remains a significant challenge in Nigeria's educational system, affecting both conventional and ODL institutions. At the NOUN, where learning is primarily facilitated through 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 intends 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. The central aim of this present study was to investigate the effective use of ICT tools in managing examination malpractice at the NOUN.

Research Questions

The following research question were raised to achieve the purpose of the study.

Research Question 1: What is the level of science students in the use of SMS and Internet Tracking Devices for monitoring and preventing examination malpractice in NOUN?

Research Question 2: What is the level of science students in the use of CCTV surveillance in deterring and identifying examination malpractice in NOUN?

Research Question 3: To what extent do science students' use of E-Registration and Authentication Systems in preventing impersonation and unauthorized access during examinations in NOUN?

Method

Research Design

The design adopted for this study was a descriptive survey design. The primary aim of a descriptive survey design is to provide opportunity for authors to administer some questionnaire to a sample of participants in order to describe their attitudes, opinions, behaviours and experiences (Creswell, 2005). Therefore, a descriptive survey design is appropriate for this study in that it would help the authors to collect data from business educators so as to determine their perceptions on the effectiveness and utilization of ICT tools in managing examination malpractice at NOUN.

Population and Sampling Procedure

The population of this study comprised all science students enrolled at the 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. The stratification was based on the three designated centers (Benin, Uromi, and Fugar) allowing for proportional selection from each location. To determine the sample size, 40% of the total science student population from each center was drawn randomly.

Research Instrument

The instrument for data collection was a questionnaire developed by the researcher titled "ICT Tools for Curbing Examination Malpractice Questionnaire". The questionnaire consists of 30 items designed to capture respondents' assessment of ICT tools for curbing examination malpractice in their study centres. The items in the questionnaire are categorized under the following ICT tools: Closed-Circuit Television (CCTV) systems (items 1-5), Short Message Service (SMS) Internet tracking devices (items 6-10), E-registration systems and Authentication (password) (items 11-15). Each item was rated based on perceived effectiveness of engagement or implementation of the ICT tool for examination screenings. The items in the questionnaire were rated on a four-point rated scale: Highly Effective (4), Effective (3), In effective (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 Collection and Analysis

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 descriptive and inferential statistics to ensure a comprehensive evaluation of the study's objectives. Specifically, the mean (\bar{X}) and standard deviation (SD) was used to analyze the research questions. A mean score of 2.50 served as the benchmark for determining positive assessment of ICT tools. This threshold was derived by summing the scale points ($4 + 3 + 2 + 1 = 10$) and dividing by the total number of scale points (4), resulting in 2.50.

Results

Research Question 1: What is the level of science students in the use of SMS and Internet Tracking Devices for monitoring and preventing examination malpractice in NOUN?

Table 1: Means and Standard Deviation on the Use of SMS and Internet Tracking Devices for Monitoring and Preventing Examination Malpractice in NOUN.

S/N	Items	n = 451		
		\bar{X}	SD	Remark
1	CCTV cameras to monitor movement outside the examination hall	2.38	1.114	Ineffective
	CCTV that monitoring suspicious movements inside the examination hall	2.49	.976	Ineffective
2	CCTV footage tracking post-examination activities, such as script collation	2.41	1.158	Ineffective
3	Special cameras in detecting examination malpractice during exams	2.12	1.035	Ineffective
4	CCTV drone camera taking top-to-bottom footage of students during examination at your center	2.14	1.148	Ineffective
	Overall Mean	2.31		

Note. n = Sample, X = Mean, SD = Standard Deviation.

Table 1 showed that the science students perceived their study centres to be ineffective in the use of CCTV cameras to monitor movement outside the examination hall, CCTV that monitoring suspicious movements inside the examination hall, CCTV footage tracking post-examination activities, such as script collation, special cameras in detecting examination malpractice during exams and CCTV drone camera taking top-to-bottom footage of students during examination at your center at mean score ranging from 2.12 to 2.49 respectively. The overall mean score on Internet Tracking Devices for monitoring and preventing examination malpractice was lesser than the criterion means of 2.50 ($2.50 < 2.31$). This showed that science students were ineffective in the usage of CCTV in NOUN study centres.

Research Question 2: What is the level of science students in the use of CCTV surveillance in deterring and identifying examination malpractice in NOUN?

Table 2: Means and Standard Deviation on the Use of CCTV Surveillance in Deterring and Identifying Examination Malpractice in NOUN

S/N	Items	n = 451		
		\bar{X}	S.D	Remark
1	Use of computer-based examinations for examination candidates at your study center	2.45	.771	Ineffective
2	Computer resources during the examination	2.30	.758	Ineffective
3	Software used in computer-based examinations	2.25	.851	Ineffective
4	Computer systems controlling objective questions during exams	2.11	.891	Ineffective
5	Computer generated questions with CBE at your study center	2.13	.856	Ineffective
	Overall Mean	2.25		

Note. n = Sample, X = Mean, SD = Standard Deviation.

Table 2 showed that the science students perceived their centres to be ineffective in the use of CBE for examination of candidates at your study center, computer resources during the examination, Software used in computer-based examinations, computer systems controlling objective questions during exams and Computer-generated questions with CBE at your study center at mean score range from 2.11 to 2.45 respectively. The overall mean score on CBE was lesser than the criterion means of 2.50 ($2.50 > 2.25$). This showed that science students were ineffective in the usage of CCTV surveillance in deterring and identifying examination malpractice in NOUN study centres.

Research Question 3: To what extent do science students' use of E-Registration and Authentication Systems in preventing impersonation and unauthorized access during examinations in NOUN?

Table 3: Means and Standard Deviation on the Use of E-Registration and Authentication Systems in Preventing Impersonation and Unauthorized Access During Examinations in NOUN

S/N	Items	n = 451		
		\bar{X}	S.D	Remark
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	2.60		

Note. n = Sample, X = Mean, SD = Standard Deviation.

Table 4 showed that the science students perceived their study centres to be effective in use of 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 means of 2.50 ($2.60 > 2.50$) This shows that science students perceived the usage of E-Registration and authentication in ensuring examination integrity and reducing malpractice effective in NOUN Study centres.

Discussion

The result showed that Science students significantly differ in their assessment of the effectiveness of SMS and internet tracking devices 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 is in line with that of Guto (2020) who indicated that the usage of short SMS and internet tracking devices will help in controlling examination malpractice since automated record management process provides evidence and track each action. In the same vein, findings from this study is in line with that of Zakka (2022) who found that controlling examination malpractice can be achieved by short message service and internet tracking devices. 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 CCTV in monitoring and preventing examination malpractice. The results of this study agreed with that of Solomon (2022) who found that the use of CCTV enhances the control of examination malpractice in MANEB. The finding of this study is also supported by that of Eziechina, Ugboaja and Esiagu (2017) who found that with CCTV, incidences of examination malpractice during exam will be drastically reduced as it has the capacity to ensure that examinations are properly monitored and recorded, serve as deterrence to potential offenders, and provide footage evidence to prove that a malpractice occurred or not. The result however, agree with that of Manyo and Oben, S. E. (2025) who found that usage of Closed-Circuit Television by school management in the conduct of semester examination in universities and utilization of CCTV System in the management of institutional facilities in universities were not effective to yield the expected result.

The result equally aligned with that of Nwogbo, Anierobi, and Nwafor (2021) who found that ICT devices and services, three were effective in public universities in South-east Nigeria. They include: CBT, CCTV, and Electronic Detectors. The findings from this study disagreed with that of Akeke and Atah (2022) who found that utilization of CCTV systems is not significantly high and utilization of CCTV systems significantly influence utilization of CCTV systems

The result of this study agreed with that of Lazarus, Dangana and Vogadika (2022) who found that usage of E-registration authentication is effective in controlling examination malpractice among students at Taraba State University. The finding of this study is also supported by that of King-Agboto, Okpara and Ugorji (2022) who found that exam malpractice has a negative effect on the quality of education but could be control by the application of E-registration and authentication. 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. Similarly, the result supports that of Fayomi, Amodu, Charles, Ayo and Idowu (2022) who found that the use of E-Registration and Authentication is effective in controlling examination malpractice in higher institutions in Nigeria

Conclusion

From this study, it was concluded that science students' assessments significantly differed: the use of E-Registration and Authentication Systems to ensure that only eligible students participate in examinations was considered effective, whereas the use of SMS and Internet tracking devices for detecting and preventing examination malpractice, as well as CCTV surveillance for deterring and identifying malpractice in NOUN, were found to be ineffective.

Recommendations

Based on the above 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 endeavor to 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 E-Registration and Authentication 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 of SMS and Internet Tracking Devices that students are aware of expectations and consequences for engaging in malpractice

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