



Research Article

Utilization of smart infrastructural facilities and the mitigation of examination malpractice in tertiary institutions

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The thrust of this study was to investigate the effects of utilization of smart infrastructural facilities on examination malpractices in tertiary institutions in South-South region of Nigeria. The design adopted for the study was the analytic survey research design. Stratified and purposive sampling techniques were utilized to select a sample of 1,080 students, from the population of 54,000 from four tertiary institutions in the study area. The data was collected using Smart Infrastructural Facilities' Utilization and Examination in Malpractice Scale. The reliability of the instrument established using Cronbach alpha technique showed the coefficient ranges from .79 to .87. Data collected were analyzed using the population *t*-test and simple regression analysis as well as analysis of variance. The findings of the analyses revealed that, the utilization of smart digitalized classrooms, computer-based tests and smart-camerised buildings would influence examination malpractices and invariably reduce examination malpractices in tertiary institutions in Nigeria and Africa at large. It was recommended among others that, government, NUC and managements of tertiary institutions in Nigeria should ensure the building of smart digitalized classrooms and lecture theatres in our institutions. Moreover, the utilization of smart infrastructural facilities should be encouraged in all higher institutions of learning across the country.

Keywords: CBT and tertiary institutions, examination malpractice, smart infrastructures, utilization

1. Introduction

Examination malpractice remains a critical challenge affecting the credibility of higher education in Nigeria. It encompasses any unethical actions taken by students before, during, or after assessments to gain an unfair advantage (Olasehinde-Williams et al., 2021). This issue not only compromises academic integrity but also devalues the quality of graduates entering the job market, ultimately hindering national progress. As noted by Adeyemi and Uko-Aviomoh (2023), the pervasive nature of examination malpractice raises serious concerns among policymakers, educators, and society, reflecting broader cultural issues and fostering a climate of dishonesty.

Several underlying factors perpetuate examination malpractice within Nigerian tertiary institutions, including insufficient preparation among students, peer pressure, and the high stakes associated with examinations that influence future prospects (Ogbonnaya & Nwaneri, 2022). Additionally, weak oversight, inadequate penalties for violators, and systemic corruption further enable this unethical behavior (Ige, 2022). Research indicates that societal pressure to achieve academic success also motivates students to engage in dishonest practices (Nwana & Ekwueme, 2021).

Numerous studies have examined examination malpractice in Nigerian higher education, each shedding light on different aspects of the issue. Omemu (2015) investigated the socio-cultural factors contributing to the prevalence of malpractice, identifying peer influence and societal expectations as significant motivators. Anderman and Murdock (2007) conducted a comprehensive review of academic dishonesty, emphasizing that many institutions have honor codes or academic integrity policies that fail in practice due to inadequate monitoring and follow-

through, making them largely symbolic rather than functional. Furthermore, Adebayo and Ojo (2021) highlighted the role of educators and invigilators, suggesting that insufficient training and a lack of professional ethics among some staff exacerbate the problem. Scholars have expressed concern that the rising incidence of examination malpractice is indicative of the deteriorating state of the educational sector. There is a growing lack of confidence in the competence of graduates, often resulting in employers requiring retraining before hiring them at lower salaries than warranted (Umeh & Obasi, 2021). High unemployment rates stem from a disconnect between the qualifications held by graduates and their actual capabilities (Ogunleye, 2023). Many graduates struggle to communicate effectively, lacking the necessary skills, knowledge, and competencies for the workforce, which has contributed to social issues (Adeleke et al., 2022).

In response to the crisis of examination malpractice, various initiatives have been launched by government agencies and examination bodies. The Federal Government of Nigeria has enacted severe penalties, including 15 years of imprisonment for offenders, while universities have suspended or expelled numerous students (Bada & Muktar, 2023). Non-governmental organizations [NGOs] have also promoted good study habits and sought to prevent malpractice through scholarships and counseling programs. However, despite these efforts, the problem persists (Ajayi et al., 2022).

Despite the existing research, there is a notable gap concerning the application of technology, specifically smart infrastructure, in addressing examination malpractice. While previous studies have concentrated on socio-cultural, institutional, and individual factors, the potential of technology as a preventive measure in Nigerian tertiary institutions remains underexplored. Existing research often focuses on general digitalization rather than the specific contributions of smart facilities. This gap is significant, as incorporating smart technologies into educational settings could provide innovative methods for monitoring and mitigating malpractice, an area that demands further investigation (Ige, 2022; Okwilagwe et al., 2023).

The ongoing prevalence of examination malpractice in Nigerian tertiary institutions calls for a prompt and inventive strategy to tackle the issue. Previous studies have offered valuable insights into the socio-economic, cultural, and institutional factors driving malpractice; however, they have not sufficiently examined how smart infrastructures, including biometric verification systems, CCTV surveillance, and automated exam monitoring technologies, could help prevent unethical behavior during examinations. This study aims to address the pressing need for technological solutions to effectively combat this long-standing problem.

With educational processes becoming increasingly digital, it is essential to investigate how smart infrastructures can be integrated into examination systems within Nigerian institutions. The World Bank (2021) indicates that education systems worldwide are swiftly adopting smart technology to enhance learning and assessment, yet many developing nations, including Nigeria, are lagging in this respect. This research intends to bridge that gap by evaluating how smart technologies can promote academic integrity and reduce reliance on human oversight, which is often prone to corruption and manipulation. Addressing this issue is crucial for enhancing the credibility of examination processes and aligning Nigeria's higher education system with global best practices in academic integrity and technology utilization (Adeyemi & Uko-Aviomoh, 2023).

Smart infrastructure encompasses technology-driven systems utilized in contemporary educational environments to improve learning and assessment. According to Adeleke et al. (2022), smart facilities include smart buildings, smart classrooms, and innovative teaching methods characterized by their interconnected and intelligent materials. Kousha (2022) further notes that smart infrastructure represents a progressive, technology-based approach that emphasizes human needs and fosters inclusivity, ultimately enhancing governance and quality of life through the effective implementation of digital technologies.

Recent studies highlight the necessity of transforming conventional schools into information-smart institutions to integrate these advanced facilities into all educational endeavors. The reasoning is evident: smart schools not only encourage active and creative thinking and facilitate computer-based learning but also create secure environments within school grounds (Bada &

Muktar, 2023). Onidinia et al. (2023) advocate for the adoption of smart infrastructures in education, arguing that such advancements will lead to a significant shift in the educational system toward a "value-based education" that is accessible to "anyone, anytime, and anywhere."

However, the successful implementation of smart infrastructures demands considerable innovation, prompting changes in teaching methods, student-teacher interactions, and the roles of educational staff. Fullan and Smith (2021) argue that smart schools equipped with such infrastructures aim to develop technologically proficient individuals, thus fostering a workforce that is well-informed, adaptable, and capable across various fields, including physical, academic, mental, emotional, and spiritual dimensions.

Furthermore, smart infrastructures have the potential to position students at the forefront of addressing examination malpractice, enhancing their creative and analytical skills, which can lead to more informed and confident decision-making during assessments (Obi & Durojaiye, 2023). The use of advanced tools like webcams, modern exam venues, and digital grading systems (e.g., Optical Mark Recognition) can significantly reduce the incidence of examination malpractice (Umeh & Obasi, 2021). In institutions with smart infrastructures, educators often shift to facilitative roles as instructional resources become readily accessible online, enabling students to receive immediate feedback on their performance.

Surveillance, defined as the observation of behaviors or actions to guide or safeguard individuals, is essential for upholding the integrity of exam processes. Lyon and David (2017) contend that contemporary surveillance techniques, such as electronic monitoring with Closed-Circuit Television [CCTV], enhance safety and help curtail misconduct in educational settings. This aligns with the broader concept of CCTV, which Clarke and Schultz (2022) define as a system of cameras relaying footage to a central monitor, primarily used for security and observation.

Computer-Based Testing [CBT] represents a modern assessment method that electronically records and evaluates responses. CBT platforms allow educators to efficiently design, schedule, and conduct various tests, whether independently or as part of virtual learning frameworks (Kuzimina, 2022; Ridgway et al., 2004). Oyero (2024) emphasizes that CBT not only provides flexibility regarding location and timing for candidates and examination bodies but also lowers expenses associated with traditional paper assessments. A key benefit of e-testing is its ability to reduce examination malpractice, a persistent issue affecting educational systems worldwide and a significant concern in both internal and external assessments across all age groups.

Automated examination monitoring systems can identify irregular behaviors during assessments, such as the use of prohibited materials or devices. These systems, powered by artificial intelligence, can detect suspicious patterns and flag potential malpractice cases for further inquiry. Ibrahim et al. (2023) assert that this technology minimizes human error and bias, offering a more objective and trustworthy means of safeguarding academic integrity. The adoption of these smart technologies in Nigerian tertiary institutions could modernize examination practices, enhancing security, transparency, and a true reflection of students' capabilities. The researchers are investigating whether the implementation of smart infrastructures—like digital classrooms, computer-based testing, and smart surveillance buildings—could effectively mitigate examination malpractice in tertiary institutions. This inquiry motivated the current research effort, and the following hypotheses were stated to guide the study:

1. The extent of examination malpractices in tertiary institutions is not significantly high.
2. There is no significant influence of smart digitalized classrooms on examination malpractices in tertiary institutions
3. There is no significant influence of computer-based testing on examination malpractices in tertiary institutions.
4. There is no significant influence of utilization of smart camerized buildings on examination malpractices in tertiary institutions.

2. Conceptual Framework

In contemporary education, integrating smart infrastructure is vital for improving learning outcomes and addressing issues like examination malpractice. Smart classrooms leverage advanced technologies to create engaging environments through interactive displays and online resources, enhancing student motivation and involvement (Hwang & Chen, 2021; Zhou et al., 2022). Digital resources provide accessible quality education regardless of location, and data-driven insights allow educators to personalize instruction, leading to better learning outcomes (Lai et al., 2023). Engaged students are less likely to resort to dishonest behaviors during assessments.

Computer-Based Testing represents another significant advancement, directly tackling examination malpractice by administering assessments electronically, streamlining the process, and providing immediate feedback (Adebayo et al., 2023; Adeyemi et al., 2024). CBT enhances efficiency, reduces administrative tasks, and offers a flexible testing environment that may reduce anxiety and improve performance (Ali et al., 2021). Additionally, CBT systems feature robust security measures like randomized questions and real-time monitoring, making cheating more difficult (El-Masri & Al-Azzam, 2022). By establishing secure testing conditions, CBT effectively reduces opportunities for malpractice.

Smart camerized buildings significantly enhance academic integrity through advanced surveillance systems, promoting campus safety and deterring misconduct (Davis & Lee, 2022; Mahmoud et al., 2021). The presence of cameras instills a sense of security and ensures examination halls are monitored to maintain integrity. Continuous monitoring fosters accountability, making dishonest actions harder to carry out (Johnson et al., 2023). Furthermore, data from these systems can be analyzed to identify misconduct patterns, enabling institutions to implement targeted interventions for improved examination security (Peters & Knight, 2023).

The integration of smart infrastructure—encompassing smart classrooms, computer-based testing, and smart camerized buildings—is essential for tackling challenges like examination malpractice. These innovations enhance learning experiences and outcomes while cultivating a culture of integrity in academic assessments. As educational institutions increasingly adopt these technologies, they are better equipped to establish secure and effective learning environments that promote honesty and accountability among students.

3. Theoretical Background

The Functionalism framework offers valuable insights into examination malpractice, particularly the growing trend of "e-cheating" among students in Nigerian tertiary institutions. This sociological perspective views crime, including academic dishonesty, as a functional aspect of social life, contributing to societal dynamics and fulfilling community needs (Durkheim, 1982). In this context, examination malpractice may be seen as a response to systemic failures, with students engaging in dishonest practices due to perceived inequities in educational systems.

The implementation of smart infrastructure—like computer-based testing and smart classrooms—addresses these maladaptive behaviors by enhancing examination integrity and security. Advanced monitoring systems in smart classrooms and exam venues reduce opportunities for academic dishonesty by ensuring stringent oversight during assessments (Davis & Lee, 2022). Such environments promote accountability and discourage misconduct by making the consequences of cheating more immediate and visible.

Additionally, the functionalist perspective underscores the importance of law enforcement agencies, such as the Economic and Financial Crimes Commission (EFCC) and regulatory bodies, in addressing crime-related societal issues, including examination malpractice. However, Omonijo et al. (2012) highlights that Nigeria's legal system often fails to prosecute offenders effectively, undermining the deterrent effect of laws against academic dishonesty. Smart infrastructures can bridge this gap by utilizing automated surveillance and monitoring systems for immediate reporting and action against cheating, thereby fostering a culture of integrity and accountability (El-Masri & Al-Azzam, 2022).

Conversely, Marxist critiques of functionalism argue that the roots of crime, including academic dishonesty, are often tied to exploitation and inequalities within capitalist societies (Marx, 1975). In Nigeria, mismanagement of educational resources and widespread corruption among elites have led to systemic decay, influencing students' ethical behaviors. This socio-economic context indicates that simply implementing smart infrastructure may not be enough to eliminate examination malpractice without addressing the underlying inequities and corruption.

Therefore, the functionalist perspective effectively highlights the complexities of examination malpractice in Nigeria's educational landscape. By employing smart infrastructure, educational institutions can combat e-cheating while also addressing broader socio-economic factors contributing to such behaviors. A comprehensive strategy that combines technological advancements with governance reforms and shifts in societal values is essential for fostering a more equitable and honest academic environment.

4. Empirical Literature

Prior research has demonstrated the positive role of digital technologies in promoting academic integrity. Omojola et al. (2021) found that smart classroom tools, such as biometric attendance and online assessments, were perceived by students as effective in reducing examination malpractice in Nigerian universities. Likewise, Thompson and Carver (2020) reported that students using digital examination systems in UK higher education experienced fewer instances of academic dishonesty. Both studies emphasize that integrating technology into assessment processes can enhance credibility, transparency, and student trust in academic evaluations.

Recent studies further support the role of smart technologies in strengthening examination integrity in higher education. Njoroge et al. (2022) reported that the adoption of smart examination tools in Kenyan universities led to a noticeable decline in academic malpractice and increased faculty confidence in the examination process. Similarly, Mokhawa and Zulu (2023) found that electronic monitoring systems in South African universities reduced opportunities for cheating and encouraged more ethical behavior among students. These findings reinforce the view that integrating digital infrastructure into academic assessments contributes to more secure and credible evaluation environments.

Several studies across diverse contexts have confirmed the positive influence of smart technologies on academic integrity. Fernandes and Oliveira (2020) found that smart assessment systems fostered more positive student attitudes toward academic honesty in Portugal. Similarly, Asante et al. (2021) reported that the use of technologies such as online proctoring significantly reduced instances of examination malpractice in Ghanaian universities. In Sweden, Zhang et al. (2020) observed that students subjected to smart examination systems felt more accountable during assessments, which contributed to lower rates of academic dishonesty. Collectively, these findings highlight the role of smart technologies in promoting ethical academic behavior and reducing cheating across various educational settings.

Emerging research continues to affirm the role of smart technologies in promoting academic integrity. Abdi and Adetunji (2023) found that biometric systems effectively deterred impersonation and fraudulent behaviors during university examinations in Nigeria. Similarly, Smith et al. (2022) reported that smart infrastructures implemented across European universities significantly reduced cheating, with students demonstrating greater commitment to academic honesty. Supporting these findings, Mabasa et al. (2021) showed that students in Zimbabwe perceived smart classrooms as environments that foster ethical academic practices and minimize academic misconduct. These studies underscore the growing consensus that technology-enhanced assessment environments contribute meaningfully to the reduction of examination malpractice.

Despite the growing research on smart infrastructures and their effects on examination integrity, notable gaps persist. Future studies should include longitudinal research to evaluate the long-term effectiveness of smart technologies, especially in light of evolving educational practices and the sophistication of cheating methods. Additionally, existing research primarily emphasizes quantitative measures, often neglecting qualitative insights from students and educators about

their experiences with these technologies. Furthermore, there is a need for investigations into the relationship between socio-economic factors and the adoption of smart infrastructures in diverse educational contexts, especially in rural versus urban settings. Addressing these gaps would enhance the understanding of effectively utilizing smart technologies to bolster academic integrity across various educational environments.

5. Method

5.1. Research Design and Participants

The study adopted a survey research design suitable for large populations, enabling the selection of a representative sample for generalizing findings. A stratified sampling technique was implemented due to the nine tertiary institutions in the area, with four institutions; University of Calabar, Cross River University of Technology, Federal College of Education, Obudu, and State College of Education, Akamkpa—selected for their diverse educational contexts. The total target population included approximately 54,000 students from second-year to final-year. Using a 2% sampling rate, the researchers determined a sample size of 1,080 respondents, ensuring statistical significance and diversity.

5.2. Data Collection and Analysis

The research instrument, the Smart Infrastructural Facilities' Utilization and Examination Malpractice Scale [SIUEMS], was carefully crafted to gather relevant data. It comprises two sections: Section A collects demographic information such as gender, age, and institution location, while Section B focuses on the core study variables, employing a four-point Likert scale. This section includes 34 items, with specific measures for the independent variable (smart classrooms, computer-based testing, smart camerized buildings) and the dependent variable (examination malpractice).

Data collection was conducted manually by researchers and trained assistants to facilitate direct engagement with respondents. They provided detailed instructions on completing the questionnaire and assured confidentiality to encourage honest feedback. After completion, the questionnaires were collected for analysis, enhancing response rates and rapport with participants.

Data analysis involved descriptive and inferential statistical techniques, including population t-tests, ANOVA, and simple regression analysis, enabling a comprehensive examination of the relationships between smart infrastructural facilities and examination malpractice, thus offering insights into technology's impact on academic integrity.

6. Findings

6.1. Findings regarding Hypothesis one

The extent of examination malpractice in tertiary institutions is not significantly high. This is a one variable hypothesis and to test this hypothesis, the population t-test was used and the result is presented in Table 1.

Table 1

Population t-test result of the extent of examination malpractices in the tertiary institutions

Variable	N	Mean	μ	MD	SD	df	t	p
Extent of examination malpractices	1080	28.67	15.0	13.67	6.07	1079	39.63*	<.001

Note. μ =population mean, MD=Mean difference, SD=Standard deviation.

The results presented in the table summarize the findings of a population t-test assessing the extent of examination malpractices in tertiary institutions. The analysis reveals a sample size of 1,080 respondents, with a mean score of 28.67 for the extent of examination malpractices. The population mean is 15.0, indicating a substantial difference in scores. The mean difference of 13.67

highlights this disparity, suggesting that the sampled institutions exhibit a considerably higher level of examination malpractice than what is considered typical in the population. The standard deviation of 6.07 reflects the variability in responses among the participants. The degrees of freedom for this analysis is 1079, which is calculated based on the sample size minus one. The t -value computed is 39.63, which is quite high and indicates a strong effect size, suggesting that the sample mean significantly differs from the population mean. The p -value is reported as .000, which is less than the alpha level of .05. This indicates statistical significance, meaning that there is a very low probability that the observed results occurred due to random chance. Therefore, since the p -value is significantly lower than the threshold, the null hypothesis—that there is no significant difference in the extent of examination malpractices—can be rejected. Instead, the alternate hypothesis, which posits that the extent of examination malpractices is indeed high, is accepted.

6.2. Findings regarding Hypothesis two

This hypothesis tested whether smart digitalized classrooms significantly influence examination malpractice in tertiary institutions. In this context, the independent variable is the use of smart digitalized classrooms, while the dependent variable is the incidence of examination malpractice—both measured as continuous variables. To examine the relationship between these variables, a simple regression analysis was conducted. The results of this analysis are presented in Table 2.

Table 2

Simple regression analysis of the influence of utilization of smart/digitalized classrooms on examination malpractice

Source of variation	Sum of Squares	df	Mean Squares	F-ratio	p
Between	879.139	1	879.139	48.172*	<.001
Within	19673.791	1078	18.25		
Total	20552.93	1079			

Note. * $R = -.82$; $R^2 = .67$; Adj $R^2 = .637$, $\beta = -.082$, $t = -27.36$; * Significant at .05

The results as shown in Table 2 indicated, $R = -.82$, which implies that there is a significant negative relationship between smart digitalized classrooms and examination malpractice. This means that as utilization of smart digitalized classrooms increases, examination malpractice reduces. More so, the results showed the Adj $R^2 = .637$, which means that variation on examination malpractice reduction can be explained by 63.7% contribution of utilization of smart digitalized classrooms. Even though the percentage contribution is high, the critical and cursory look at the analysis of variance table showed ($F = 48.17^*$, $p < .05$). This result implies that there is a significant influence of smart digitalized classrooms on examination malpractices reduction.

6.3. Findings regarding Hypothesis three

This hypothesis tested whether the utilization of computer-based testing significantly influences the reduction of examination malpractice. In this context, the independent variable is the utilization of computer-based testing, while the dependent variable is the reduction of examination malpractice—both treated as continuous variables. To evaluate this relationship, a simple regression analysis was conducted, and the results are presented in Table 3.

Table 3

Simple regression analysis of the influence of computer-based testing on examination malpractice reduction

Source of variation	Sum of Squares	df	Mean Squares	F-ratio	p
Between	967.11	1	967.11	53.25	<.001
Within	19589.93	1078	18.16		
Total	20552.93	1079			

Note. * $R = -.782$; $R^2 = .597$; Adj $R^2 = .597$, $\beta = -.0782$, $t = -39.1$

The results presented in Table 3 showed that, $R = .782$ which implies that, there is a negative relationship between utilization of CBT and examination malpractice reduction. That is to say utilization of CBT increases, examination malpractice reduces. The results also indicated $\text{Adj } R^2 = .597$ which implies that, the variation in examination malpractice reduction can be explained by 59.7% contribution of the utilization of computer-based testing. Furthermore, a cursory look at the analysis of variance table showed ($F = 53.25, p < .05$). This result implies that there is a significant influence of utilization of computer-based testing on examination malpractice reduction. Here, the null hypothesis is also rejected.

6.4. Findings regarding Hypothesis four

This hypothesis examined whether the utilization of smart camerized buildings has a significant influence on the reduction of examination malpractice. In this case, the independent variable is the utilization of smart camerized buildings, while the dependent variable is the reduction of examination malpractice—both measured as continuous variables. To test this hypothesis, a simple regression analysis was conducted, and the results are presented in Table 4.

Table 4

Simple regression analysis on the influence of Smart camerised buildings on examination malpractice reduction

Source of variation	Source of variation	df	Mean Square	F-ratio	p
Between	760.167	1	760.167	41.40*	<.001
Within	19792.25	10.78	18.360		
Total	20552.92	1079			

Note. * $R = -.567$; $R^2 = .321$; $\text{Adj } R^2 = .311$, $\beta = -.0567$, $t = -5.67$

The results presented in Table 4 showed $R = -.567$, which implies that there is negative relationship between the utilization of Smart camerized buildings and examination malpractice reduction. More so, the results revealed an $\text{Adj } R^2 = .311$ which implies that the variation in the examination malpractices could be explained by 31.1% contribution of utilization of smart-camerized buildings. Further, cursory look at the analysis of variance has shown ($F = 41.40, p < .05$). This result implies that there is a significant influence of smart-camerized buildings on examination malpractice reduction. Hence, the null hypothesis is rejected as well.

7. Discussion

The findings reveal a concerning prevalence of examination malpractice in tertiary institutions, significantly deviating from the population mean. This issue aligns with prior research, notably by Ugobueze (2024), who argues that examination malpractice erodes academic integrity and devalues educational qualifications by undermining the credibility of academic credentials. Contributing factors include inadequate supervision, societal pressures, and technology's role in normalizing cheating. Omonijo (2019) supports this, highlighting weak policies and resource constraints that enable malpractice in Nigeria's educational institutions. Conversely, personal ethics play a crucial role in students' decision-making, highlighting that individual accountability must be acknowledged alongside systemic shortcomings (Rosenblatt, 2017). The evidence underscores the urgent need for educational reforms, such as adopting technological strategies to enhance integrity. Successful reductions in academic dishonesty in other countries suggest that a comprehensive approach, addressing both systemic weaknesses and personal responsibility, is crucial (Miranda-Rodríguez et al., 2024).

The study also indicates a significant negative relationship between the use of smart digitalized classrooms and examination malpractice. Technological tools can engage students, fostering understanding and reducing cheating temptation. Arslan and Kuzu (2020) found that interactive learning environments enhance motivation and integrity, shifting focus from merely passing exams to genuine comprehension. Digital tools, including plagiarism detection software, further deter cheating. Liu et al. (2021) demonstrated that secure online assessments significantly reduced

dishonesty, as increased monitoring raises accountability perceptions. Enhanced digital literacy correlates with ethical behavior, as noted by Umoru and Oviawe (2022), indicating that familiarity with technology decreases malpractice likelihood. However, over-reliance on technology may breed complacency; thus, it's essential to combine technological advancements with educational programs emphasizing integrity.

The study also found a significant negative relationship between computer-based testing (CBT) and examination malpractice. Factors such as enhanced security features and monitoring capabilities of CBT platforms contribute to integrity. Owolabi and Salako (2022) noted that features like randomized questions and digital proctoring reduce cheating opportunities. The anonymity of CBT may further decrease malpractice, with Nwachukwu et al. (2021) observing that digital formats lessen peer pressure, promoting individual responsibility. Nonetheless, Eze et al. (2020) caution that students may still exploit systems, highlighting the need for educational reforms alongside technological solutions.

Similarly, the study showed a negative relationship between smart camerized buildings and examination malpractice, indicating that surveillance increases accountability. Deterrence theory supports this, as students perceive higher detection risks when monitored (Gurd et al., 2019). Kogan and Tatar (2020) found that digital proctoring reduces cheating, while Morris (2021) emphasized that environments lacking such technology can normalize dishonesty. However, over-reliance on surveillance can foster distrust, affecting the learning atmosphere (Michaels, 2019). Thus, it is vital to couple technology with initiatives promoting integrity.

8. Conclusion

The study's findings underscore the critical implications for educational practices and the understanding of examination malpractice in tertiary institutions. While malpractice is alarmingly prevalent, the use of technologies such as CBT, smart surveillance, and digital classrooms correlates negatively with dishonest behaviors. This suggests that integrating technology into education can effectively combat academic dishonesty. Theoretically, these findings enrich the discussion on academic integrity, highlighting technology's role in influencing student behavior. As prior studies indicate, technology fosters accountability and ethical practices (Arslan & Kuzu, 2020; Liu et al., 2021). Practically, the study advocates for educational institutions to invest in technology-enhanced learning environments. Implementing systems like CBT and smart classrooms creates a more secure atmosphere that deters cheating. In a rapidly evolving educational landscape, prioritizing technological upgrades is essential for maintaining academic integrity.

9. Recommendations

Based on the findings, several key recommendations are proposed to enhance academic integrity through the use of technology. Educational institutions should prioritize investment in smart infrastructure, such as computer-based testing (CBT) systems and smart classrooms, and ensure both faculty and students are trained to use these tools effectively. Continuous monitoring and evaluation of these technologies are essential, with institutions establishing robust feedback mechanisms to assess their impact on examination malpractice and refine strategies as needed. Complementing these efforts, awareness programs centered on academic integrity should be implemented to educate students about the ethical consequences of malpractice and the responsible use of technology. Additionally, collaboration with technology experts is crucial for developing secure and effective assessment platforms, as well as employing data analytics to monitor student performance for signs of misconduct. Finally, ongoing research and development, particularly longitudinal studies, are necessary to understand the long-term implications of technological interventions and to ensure they adapt to the evolving educational environment. .

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Data availability: Data will be made available upon request.

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