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Remote Proctoring and Assessment Integrity in National Open University of Nigeria Programmes: Complexities and Implications for Reform

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Abstract. This study investigates the impact of remote proctoring on assessment integrity and student learning experiences in the Faculty of Computing at the National Open University of Nigeria (NOUN). Adopting a cross-sectional mixed-methods design, quantitative survey data and qualitative interview data were collected from 30 lecturers, 90 postgraduate (M.Sc.) students, and 5 academic administrators, purposively selected for their sustained engagement with technology-mediated, high-stakes e-assessments. Validated instruments were used, with reliability coefficients exceeding acceptable thresholds. Quantitative data were analysed using descriptive statistics, while qualitative data were

subjected to thematic analysis. The findings indicate that remote proctoring is generally perceived as enhancing examination fairness and reducing opportunities for academic dishonesty, thereby positively influencing assessment credibility. However, moderate levels of student anxiety and concerns relating to privacy, technological reliability, pedagogical alignment, and institutional governance were identified as key implementation challenges. The results further suggest that the effectiveness of remote proctoring is strengthened when complemented by alternative assessment strategies, such as project-based tasks and portfolios, which promote learner flexibility without compromising integrity. The study underscores the need for improved digital infrastructure, clearer ethical and policy frameworks, targeted capacity-building for faculty, and the integration of diversified assessment approaches. These findings provide practical and policy-relevant insights for strengthening assessment integrity in open and distance learning institutions.

Keywords: Assessment integrity, Digital infrastructure, Distance education, Learner flexibility, Remote proctoring

Introduction

The National Open University of Nigeria, as the country's first dedicated distance learning institution, has played a transformative role in expanding access to higher education, particularly for working adults, geographically isolated learners, and individuals unable to participate in conventional university education. Over the past two decades, NOUN has evolved from a reliance on print-based study materials to sophisticated online learning platforms that leverage digital technologies and modern pedagogical approaches. The onset of the global COVID-19 pandemic accelerated this shift, compelling educational institutions worldwide to adopt remote learning solutions rapidly (Jegede, 2016). For NOUN, already operating within an Open and Distance Learning (ODL) framework, the pandemic highlighted both the resilience and vulnerabilities of distance education systems, emphasising the urgent need to ensure that assessment practices uphold academic integrity while maintaining the flexibility central to its educational mission.

Assessment integrity remains a persistent challenge in distance education globally. Traditional assessment methods, designed for face-to-face environments, often prove inadequate in ODL contexts (Okonkwo, 2011; Muchemwa, 2023). The spatial separation between instructors and learners creates opportunities for academic dishonesty, raising questions about the credibility and validity of qualifications earned remotely. In Nigeria, such concerns are exacerbated by historical scepticism among employers and professional bodies about the quality of ODL qualifications (Ojo & Olakulehin, 2006). In response, NOUN has introduced remote proctoring technologies to monitor student assessments, aiming to replicate the oversight and security of conventional examination halls within digital environments (Adebisi & Oyeleke, 2018; Crisp & Duffy, 2020; Zira, 2024).

Despite their promise, implementing remote proctoring in ODL programmes poses significant challenges. Technical requirements, including reliable hardware, software, and internet access, can inadvertently exclude learners, particularly in developing contexts where digital infrastructure is uneven. Privacy concerns arise from the intrusive nature of certain proctoring methods, which may conflict with learners' expectations of autonomy. Moreover, the psychological impact of being monitored, such as heightened test anxiety, can affect student performance, particularly for learners accustomed to the self-paced flexibility of ODL programmes (Braun & Clarke, 2006). Consequently, while remote proctoring enhances assessment security, it risks undermining the accessibility and learner-centred ethos that define ODL philosophy (Agbu et al., 2018).

This tension between assessment integrity and learner flexibility presents a fundamental dilemma for NOUN. Socio-economic disparities, cultural attitudes toward surveillance, and uneven access to technology in Nigeria further complicate the adoption of remote proctoring, influencing both its effectiveness and learner acceptance (Jegede, 2016). Additionally, current research on remote proctoring in Nigerian higher education is limited, focusing primarily on technical implementation rather than pedagogical implications, learner experiences, or institutional policy frameworks (Hainline et al., 2020; Akanbi, 2024). While international literature provides useful insights, it often fails to fully account for the specific challenges and cultural contexts of Nigerian ODL institutions (Ajadi et al., 2008).

Despite the growing adoption of remote proctoring in distance education, significant knowledge gaps persist regarding its impact on assessment integrity, learner experience, and equitable access in the Nigerian context. Existing studies primarily focus on technical implementation, often overlooking the pedagogical, ethical, and institutional dimensions of remote proctoring in ODL programmes (Hainline et al., 2020). However, recent international studies indicate that while remote proctoring may enhance perceptions of fairness and reduce opportunities for academic dishonesty, its effectiveness remains uneven and highly context-dependent. Empirical evidence from studies conducted in North America and Europe suggests that remote proctoring can strengthen examination credibility and deter cheating when supported by robust digital infrastructure and clear institutional policies (Dendir & Maxwell, 2020; Eaton & Turner, 2021; Kharbat & Abu Daabes, 2021). Conversely, other studies report mixed learner responses, highlighting increased test anxiety, resistance to surveillance, and concerns over privacy and data protection (Milone et al., 2017; Alessio et al., 2022). Recent research further indicates that remote proctoring may conflict with learner-centred and constructivist pedagogies when deployed as a purely surveillance-driven solution rather than as part of a broader assessment strategy (Flaherty & Johnston, 2020; Bearman et al., 2023). Notably, much of this literature is situated in well-resourced, conventional university settings with relatively stable access to technology, limiting its direct applicability to open and distance learning institutions in developing contexts where infrastructural constraints, socio-economic inequalities, and cultural attitudes toward monitoring significantly shape learner experience and acceptance. In particular, there is limited empirical evidence on how remote proctoring affects student performance, test anxiety, and perceptions of fairness, especially within socio-economically and technologically diverse learner populations at NOUN.

While alternative assessment strategies, such as authentic assessments, portfolios, and project-based learning, have been suggested as complements to technological solutions, little is known about their feasibility, acceptance, and integration within NOUN's existing ODL framework (Idialu, 2013; Adebisi & Oyeleke, 2018). Likewise, institutional policies and ethical considerations, which are critical for shaping the success of both technological and pedagogical interventions, remain underexplored in the Nigerian distance education literature (Osuji, 2012; Jegede, 2016).

This study addresses these gaps by examining the complexities and implications of remote proctoring at NOUN, focusing on balancing academic integrity, learner flexibility and equitable access. It provides evidence-based findings to inform reform of assessment practices in Nigerian ODL institutions. The paper responds to the impact of remote proctoring on assessment integrity and student learning experiences in NOUN programmes, the technical, pedagogical, ethical, and access-related challenges that influence the implementation of remote proctoring in NOUN and how institutional policies and alternative assessment strategies can be leveraged to ensure a balance between academic integrity and learner flexibility in NOUN programmes.

Research Problem

The rapid expansion of enrolment in ODL programmes at the NOUN, now serving over 200,000 learners nationwide, has intensified reliance on technology-mediated assessments and remote proctoring systems. While remote proctoring has been adopted to safeguard examination credibility, existing research in the Nigerian context has largely privileged technical deployment and system efficiency, offering limited insight into its pedagogical, ethical, and equity-related implications. Consequently, there is insufficient empirical evidence on how remote proctoring shapes assessment integrity, learner experience, and perceptions of fairness within socio-economically and technologically diverse ODL populations. This gap is both socially and scientifically significant. Societally, unresolved tensions between assessment security and learner flexibility risk undermining public trust in ODL qualifications and the legitimacy of NOUN graduates. Scientifically, the literature remains underdeveloped in theorising remote proctoring as an assessment practice embedded within broader pedagogical, institutional, and cultural systems, particularly in developing-country ODL contexts. By interrogating remote proctoring beyond its technical function, this study addresses a critical knowledge gap regarding how assessment integrity can be achieved without eroding the learner-centred ethos that underpins ODL philosophy.

Research Focus

The study examines remote proctoring at NOUN as a socio-technical and pedagogical phenomenon rather than merely a technological solution to examination malpractice. Specifically, it investigates how remote proctoring interacts with learner experience, equity of access, and institutional governance within an ODL environment characterised by infrastructural unevenness and diverse learner profiles. Conceptually, the study advances the discourse by situating remote proctoring within a broader assessment ecology that includes pedagogical alignment, ethical safeguards, and alternative assessment strategies. This focus addresses gaps in the existing literature, which rarely integrate technological, pedagogical, and policy dimensions within a single analytical framework, particularly within African ODL institutions.

Research Aim and Research Questions

The study aims to evaluate the impact of remote proctoring on assessment integrity and learner experience at NOUN and to identify strategies for balancing academic integrity with learner flexibility through appropriate policies and alternative assessment approaches.

Guided by this aim, the study addresses the following research questions:

1. What impact does remote proctoring have on assessment integrity and student learning experiences in NOUN programmes?
2. What technical, pedagogical, ethical, and access-related challenges shape the implementation and acceptance of remote proctoring in NOUN?
3. How can institutional policies and alternative assessment strategies be leveraged to achieve a sustainable balance between academic integrity and learner flexibility in NOUN's ODL programmes?

Literature Review

Theoretical Framework

The framework is based on three relevant theories that address issues such as learning in open and distance education, the role of technology in education, assessment integrity, and the balance between

flexibility and quality in education. This framework integrates constructivist learning theory with the Technology Acceptance Model.

Constructivist Learning Theory

The Constructivist Learning Theory has its roots in the work of developmental psychologists Jean Piaget and Lev Vygotsky in 1973 and 1978, respectively (Davis, 1989). At the heart of this theory is the idea that learners actively construct their own understanding of the world through interaction with their environment, including people, materials, and technology. The core principles of constructivism suggest that knowledge is not passively absorbed but is actively built by the learner through engagement with experiences. Both Piaget and Vygotsky emphasised that learning is a social, dynamic, and context-dependent process. Piaget's theory centres on how children develop cognitive structures that help them understand the world and how they progress through stages of cognitive development. Vygotsky, on the other hand, focused more on the social and cultural dimensions of learning, introducing concepts such as the zone of proximal development (ZPD), which highlights the difference between what learners can do independently and what they can do with assistance from more knowledgeable others (teachers, peers, or technology) (Chua et al., 2021). In essence, constructivism argues that learners are not blank slates to be filled with knowledge but active agents in their own learning process. This leads to an emphasis on authentic learning experiences rich in opportunities for critical thinking, problem-solving, and collaboration.

Figure 1

Principles of Constructivism

Source: Bruner (1996)

Contemporary discussions of assessment in ODL increasingly draw on constructivist perspectives to interrogate how learning, assessment, and technology interact in digitally mediated environments. Rather than treating constructivism as a static learning theory, recent scholarship positions it as a conceptual lens for understanding learner agency, contextualised knowledge construction, and the alignment between

pedagogy and assessment. Within this literature, a recurring concern is whether technologically driven assessment mechanisms — particularly remote proctoring, support or undermine the learner-centred principles that define constructivist-oriented ODL systems.

Empirical studies in distance education consistently affirm that learners in online environments are not passive recipients of content but active participants who construct meaning through engagement with tasks, peers, and digital tools. This has prompted a shift away from purely summative, invigilated examinations toward more authentic and flexible forms of assessment. However, the rapid expansion of enrolment in ODL institutions and the intensification of concerns about academic misconduct have simultaneously driven a renewed reliance on surveillance-based assessment technologies. This dual trend has produced a conceptual tension within the literature: while constructivist pedagogies prioritise autonomy, trust, and contextual learning, remote proctoring technologies are often designed around control, standardisation, and behavioural monitoring.

Studies from well-resourced higher education contexts indicate that remote proctoring can enhance perceptions of assessment credibility and fairness, particularly in large-scale online courses where face-to-face invigilation is impractical. These studies suggest that technology-enabled monitoring can deter impersonation and cheating, thereby strengthening confidence in online credentials. At the same time, a growing body of empirical research highlights contradictions in learner responses. While some students perceive remote proctoring as necessary to maintain standards, others report heightened anxiety, discomfort with surveillance, and a sense that such systems conflict with the ethos of flexible, self-directed learning. These mixed findings suggest that the effectiveness of remote proctoring cannot be understood solely in technical terms but must be analysed within broader pedagogical and institutional frameworks.

Within the constructivist-oriented assessment literature, there is an increasing emphasis on the alignment among learning activities, assessment tasks, and the learner's context. From this perspective, assessments are most valid when they allow learners to demonstrate understanding through application, reflection, and problem-solving rather than through decontextualised recall. Empirical studies on authentic assessment consistently report positive outcomes in terms of learner engagement, deeper understanding, and perceived relevance of learning tasks. However, such assessments raise complex questions about integrity in ODL environments, particularly when students complete tasks remotely and asynchronously. Remote proctoring has emerged as one response to this challenge, yet its integration with constructivist assessment practices remains underexplored, especially in developing-country contexts.

In African and Nigerian ODL literature specifically, research on remote proctoring remains limited and uneven. Existing studies tend to prioritise implementation narratives, system descriptions, or policy intentions, with relatively little empirical attention to learner experience, pedagogical alignment, or equity of access. Where learner perspectives are examined, findings frequently point to infrastructural constraints, including unreliable internet connectivity, limited access to suitable devices, and uneven digital literacy. These constraints complicate assumptions embedded in much of the international literature, which often presumes stable technological environments and institutional capacity. As a result, the applicability of dominant models of remote proctoring to contexts such as NOUN remains empirically uncertain.

From a constructivist standpoint, learner autonomy and contextual familiarity are critical to meaningful knowledge construction. Empirical evidence from ODL settings suggests that assessment environments perceived as overly restrictive or alien can negatively affect learner performance, not necessarily due to lack of competence but due to anxiety and reduced cognitive engagement. Remote proctoring introduces a paradox in this regard. On the one hand, it allows learners to complete assessments within familiar environments, potentially supporting contextualised performance. On the other hand, the

intrusive features of some proctoring systems, such as constant video surveillance or biometric monitoring, may disrupt learners' sense of control and psychological safety. The literature reflects this contradiction, with studies reporting both enhanced convenience and increased stress among remotely proctored learners.

Another significant gap in the literature concerns the role of institutional policy and governance in mediating the relationship between constructivist pedagogy and remote proctoring. Empirical studies increasingly suggest that learner acceptance of proctoring technologies is strongly influenced by transparency, clarity of rules, ethical safeguards, and perceived fairness of implementation. Where institutional policies clearly articulate data protection measures, assessment expectations, and channels for learner support, resistance to proctoring appears lower. Conversely, poorly communicated or inconsistently enforced policies tend to amplify distrust and resistance, particularly in contexts where historical scepticism toward surveillance and authority exists. Despite this, institutional policy is rarely theorised within the assessment ecology in constructivist frameworks, which represents a notable conceptual gap.

The present study addresses these empirical and conceptual gaps by operationalising constructivist learning theory as an analytical framework rather than a descriptive backdrop. Specifically, constructivism informs the study's examination of how remote proctoring shapes learner experience, autonomy, and perceptions of fairness within NOUN's ODL environment. The framework enables an analysis of whether remote proctoring functions as a supportive scaffold, enhancing assessment credibility while preserving learner agency, or as a constraining mechanism that conflicts with constructivist principles. This theoretical positioning directly informs the empirical components of the study, including the exploration of learner experiences, faculty perceptions, and institutional practices.

Importantly, the study also extends constructivist discourse by integrating alternative assessment strategies into the analysis. While the literature frequently advocates portfolios, project-based learning, and other authentic assessments as constructivist ideals, there is limited empirical evidence on how these approaches can coexist with remote proctoring in large-scale ODL systems. By examining how such strategies are perceived, implemented, or constrained within NOUN, the study contributes conceptually to understanding assessment integrity as a balance between technological control and pedagogical trust.

Technological Acceptance Model (TAM)

The Technological Acceptance Model (TAM), developed by Davis (1989), is a widely used framework for understanding how individuals adopt and use new technologies. TAM posits that two primary factors, perceived ease of use and perceived usefulness, determine an individual's attitude toward a technology, which in turn shapes their behavioural intention to use it. Research on technology adoption in higher education consistently demonstrates that the success of digital innovations depends less on technical availability than on users' perceptions and experiences. Across studies of online learning platforms and e-assessment systems, two recurring determinants of acceptance emerge: whether users perceive a technology as useful for achieving valued outcomes and whether they find it easy to use in their specific context. Empirical findings suggest that when these conditions are met, technologies are more likely to be integrated into routine academic practice; when they are not, resistance, anxiety, or superficial compliance often follows.

In the context of remote proctoring, existing literature reveals a mixed pattern. Studies conducted in well-resourced environments frequently report that students and faculty perceive proctoring technologies as useful for strengthening examination credibility and deterring academic misconduct. However, this perceived usefulness is often offset by concerns about system reliability, privacy, and increased cognitive or administrative burden. Evidence further indicates that perceived ease of use is highly context-

dependent: stable internet connectivity, intuitive interfaces, and accessible technical support significantly enhance acceptance, while infrastructural constraints and complex system requirements reduce it. These contradictions point to a gap in the literature regarding how acceptance dynamics operate in large-scale ODL institutions in developing contexts, where technological conditions are uneven, and learner populations are highly diverse.

Applying the Technological Acceptance Model in this study enables a focused examination of these acceptance dynamics within NOUN. Rather than treating remote proctoring as a neutral technical solution, TAM provides a conceptual lens for analysing how stakeholder perceptions shape its effectiveness as an assessment practice. For students, acceptance is not solely determined by whether remote proctoring secures examinations but also by whether it is experienced as manageable, transparent, and compatible with their learning realities. Empirical studies suggest that when learners perceive proctoring systems as intrusive or technically demanding, perceived usefulness diminishes, even if integrity outcomes are acknowledged.

Similarly, faculty and administrators' acceptance is shaped by whether remote proctoring is seen to enhance assessment reliability without imposing disproportionate workload, ethical risk, or operational complexity. Prior research highlights a recurring tension: while institutional actors may endorse proctoring in principle, practical challenges and governance concerns often moderate their support. However, few studies empirically examine these perceptions within African ODL institutions.

By operationalising TAM in its empirical design, this study links stakeholder perceptions directly to observed challenges and outcomes of remote proctoring at NOUN. In doing so, it extends the existing literature by situating technology acceptance within a broader assessment ecosystem encompassing infrastructure, policy, ethics, and learner experience. This approach contributes conceptually by demonstrating that acceptance is not merely a precursor to adoption but a mediating factor in achieving assessment integrity and equity in ODL contexts.

Remote Proctoring, Balancing Flexibility and Quality

The increasing demand for flexible learning options has led to the growth of ODL institutions like NOUN. These institutions cater to non-traditional students who require flexible study schedules due to work, family obligations, or geographical constraints. However, providing flexibility in assessments, such as online exams, raises concerns about maintaining academic integrity and ensuring high-quality assessments (Teo, 2011a). Remote proctoring technologies have emerged as a solution to address these concerns by monitoring students during online exams to prevent cheating and fraud.

Remote proctoring is often seen as a technology that supports flexibility by enabling students to take exams from any location at their convenience (Sclater et al., 2016). Studies show that remote proctoring can provide significant flexibility in assessment scheduling, especially valuable in open universities like NOUN, where students are spread across large geographic areas (Akande & Akuchie, 2022; Osuji, 2012). Moreover, remote proctoring allows students to participate in assessments without having to travel to physical examination centres, reducing time and cost barriers for students in remote locations (Chua et al., 2021). However, while flexibility is crucial in ODL environments, it must not come at the expense of assessment quality. Maintaining high academic standards is essential to preserve the credibility and reputation of institutions like NOUN (Okonkwo, 2011). Studies show that while remote proctoring enables flexibility, its impact on assessment quality depends on the reliability and effectiveness of the technology used (UNESCO, 2023).

The challenge, therefore, lies in finding a balance between the flexibility that remote proctoring offers and the need to maintain assessment quality. Some studies argue that remote proctoring can ensure quality

by providing real-time monitoring and recording, thereby upholding the integrity of assessments (Sclater et al., 2016). However, others caution that, if not implemented properly, remote proctoring systems can lead to privacy concerns, technical failures, and a lack of access to appropriate resources for some students (Hainline et al., 2020).

Challenges of Implementing Remote Proctoring in E-Examinations

1. Technological Challenges: Implementing remote proctoring systems in institutions such as NOUN poses several challenges. According to research by Chua et al. (2021), issues such as poor internet connectivity, inadequate devices, and technical failures can undermine the effectiveness of remote proctoring. These challenges are particularly pronounced in developing countries like Nigeria, where access to reliable technology may be limited in rural areas (Fask et al., 2014). Additionally, the learning curve associated with using new proctoring systems may cause frustration for both students and faculty.

2. Equity and Access Issues: One of the most significant challenges in implementing remote proctoring at NOUN is ensuring equitable access for all students. Many students at NOUN may lack access to high-speed internet, reliable devices, or private spaces to take exams (Agbu et al., 2018; Daniel & Gwary, 2022). This digital divide creates disparities in students' ability to participate in remote proctoring, raising concerns about fairness and equality in the assessment process.

3. Privacy and Data Security Concerns: The use of surveillance technologies in remote proctoring raises privacy concerns, particularly in contexts such as Nigeria, where data protection laws may not be as robust as in other parts of the world (Kumar & Dawson, 2018; OECD, 2020). Students and faculty may be concerned about the collection, storage, and use of personal data, including biometric data, during remote proctoring sessions. Without proper safeguards in place, this could result in ethical dilemmas and the exploitation of students' personal information (Hainline et al., 2020).

4. Cost Implications: Implementing remote proctoring technologies is another significant challenge for institutions like NOUN, which may already face financial constraints. The expenses associated with licensing software, training staff, and ensuring infrastructure readiness can be substantial (Weiner & Hurtz, 2017; Bashiru & Odu, 2021). Given the financial limitations faced by many students and the institution itself, the cost of remote proctoring technologies must be carefully considered in the decision-making process.

Remote Proctoring on Assessment Integrity

One of the main objectives of remote proctoring is to ensure that online assessments are secure and free from cheating. Studies indicate that remote proctoring can be effective in reducing cheating through techniques such as identity verification, monitoring student behaviour, and automated alerts for suspicious activity (Idialu, 2013). However, concerns about the system’s ability to detect sophisticated cheating methods persist, with some studies suggesting that students may find ways to bypass proctoring systems (Crisp & Duffy, 2020; INACOL, 2020).

The role of remote proctoring in maintaining academic integrity is a subject of ongoing debate. While it is seen as a valuable tool for ensuring the authenticity of online assessments, some critics argue that remote proctoring systems may only provide a partial solution to integrity concerns. Issues such as student anxiety, reduced engagement, and potential psychological stress may undermine the overall effectiveness of remote proctoring in promoting fair assessments (Weiner & Hurtz, 2017; Ologede, 2019).

In the long term, the widespread adoption of remote proctoring technologies could change how assessments are perceived and conducted in higher education. The adoption of these technologies could encourage institutions like NOUN to implement more rigorous quality assurance measures in online

education, potentially improving the overall academic experience. However, it is crucial that remote proctoring is integrated thoughtfully, with a focus on ethical considerations, equity, and the preservation of academic integrity (Adebisi & Oyeleke, 2018; Adelakun, 2020).

Materials and Methods

Research Design

The study adopted a mixed-methods approach, integrating both quantitative and qualitative techniques for data collection and analysis. Specifically, a cross-sectional descriptive survey research design was employed to collect comprehensive data from lecturers, students, and administrators at NOUN. This design was considered appropriate for capturing participants' perceptions and experiences at a single point in time.

Sample and Participants

The study population comprised 35 lecturers, 110,000 M.Sc. students from the Faculty of Computing, and 10 administrators of NOUN (NOUN, 2025). Guided by the sample size determination procedure recommended by Research Advisors (2006), the study sampled 30 lecturers, 90 M.Sc. students, and 5 administrators.

The use of purposive sampling and small subsamples was appropriate given the study's exploratory, context-specific focus, which prioritises analytic rather than statistical generalisation. Therefore, the Faculty of Computing was purposively selected because it is one of the most technologically intensive faculties at NOUN, where digital platforms, online assessments, and e-examinations are integral to teaching and learning. As a result, lecturers and students in this faculty have substantial experience with remote assessment and proctoring systems, positioning them to provide informed, experience-based insights into their effectiveness, challenges, and implications. Furthermore, M.Sc. students were selected because postgraduate programmes rely heavily on technology-mediated, high-stakes assessments that demand robust academic integrity mechanisms

Instrument and Procedure

Data were collected using Structured Questionnaires (SQ) and In-depth Interviews (II). The instruments underwent face and content validation by subject-matter experts to ensure their appropriateness and relevance. Reliability was established through a pilot study, and internal consistency was determined using Cronbach's alpha. The reliability coefficients obtained were 0.85 for the Structured Questionnaire and 0.82 for the In-depth Interview instrument, indicating high reliability.

Ethical considerations were strictly observed throughout the study. Participants provided informed consent prior to data collection and were assured of the confidentiality and anonymity of their responses. All research procedures conformed to accepted ethical research standards.

Data Analysis

Quantitative data obtained from the questionnaires were coded and analysed using descriptive statistics, including absolute and relative measures, with the aid of the Statistical Package for Social Sciences (SPSS) version 21. Qualitative data generated from the in-depth interviews were analysed using thematic analysis, enabling the identification of key themes and patterns relevant to the study objectives.

Results

Research Question 1: What is the impact of remote proctoring on assessment integrity and student learning experiences in NOUN programmes?

Table 1

Descriptive statistics for impact of remote proctoring on assessment integrity and student learning experiences

Statements	Mean (X)	SD	Remark
Examination fairness is enhanced through the use of remote proctoring.	4.2	0.65	Agree
Opportunities for cheating are minimized during remote proctored assessments.	4.0	0.78	Agree
Remote proctoring improves the reliability of assessment results	3.8	0.82	Agree
Remote proctoring increases student anxiety during exams	3.4	0.90	Neutral
Remote proctoring positively impacts learning experiences	3.9	0.74	Agree

SD=Standard Deviation, Decision Mean=3.5

Source: Fieldwork, 2025

Table 1 examined the impact of remote proctoring on assessment integrity and student learning experiences in NOUN programmes. The findings suggest that remote proctoring in NOUN programmes generally enhances assessment integrity and student learning experiences, reinforcing its value as a tool for maintaining fairness and credibility in distance education. The high mean scores for fairness (X = 4.2) and reduction of cheating (X = 4.0) indicate that students perceive remote proctoring as enhancing equity and limiting academic dishonesty, which could improve the credibility of NOUN qualifications in the eyes of employers and professional bodies. Moderate agreement on the reliability of results (X = 3.8) suggests that while remote proctoring contributes to dependable assessment outcomes, some students remain sceptical. The neutral-to-slightly-agree score for exam anxiety (X = 3.5) highlights a need to manage psychological stress associated with monitoring. Taken together, these findings imply that while remote proctoring can strengthen assessment quality and credibility, its effective implementation depends on carefully balancing security and integrity measures with learner-centred strategies that reduce anxiety, address ethical concerns, and support positive, inclusive learning experiences.

Research Question 2: What are the technical, pedagogical, ethical, and access-related challenges that influence the implementation of remote proctoring in NOUN?

Table 2

Descriptive statistics for technical, pedagogical, ethical, and access-related challenges

Statements	Mean (X)	SD	Remark
Limited internet connectivity affects the effective use of proctoring	4.3	0.61	Agree
The proctoring system is easy to use and navigate	3.6	0.88	Agree
Privacy concerns arise due to continuous monitoring	4.1	0.69	Agree
Faculty are adequately trained to implement remote proctoring	3.2	0.95	Neutral
Access to required hardware/software is sufficient for all students	3.0	0.97	Neutral

SD=Standard Deviation, Decision Mean=3.5

Source: Fieldwork, 2025

Table 2 examined the challenges influencing the implementation and effectiveness of remote proctoring in NOUN. The findings indicate that while remote proctoring offers potential benefits for assessment integrity, its effectiveness in NOUN is constrained by several interrelated technical, ethical, and pedagogical challenges. The high mean for limited internet connectivity (X = 4.3) highlights that unequal access to reliable digital infrastructure remains a critical barrier, potentially excluding some students and undermining equitable assessment opportunities. Moderate agreement on system usability (X = 3.6) suggests that while many stakeholders find the technology navigable, differences in digital literacy and familiarity with online platforms may hinder smooth adoption. Ethical concerns, reflected in the strong agreement regarding privacy invasions (X = 4.1), underscore the need to balance surveillance for integrity with respect for learner autonomy and confidentiality.

Furthermore, the lower mean for faculty training (X = 3.2) indicates gaps in pedagogical preparedness that could affect the consistent implementation of proctoring systems. Neutrality on hardware and software access (X = 3.0) signals persistent equity challenges. These findings imply that the successful adoption of remote proctoring in NOUN requires more than technological solutions alone; it also depends on robust ethical safeguards, sustained capacity-building for staff and students, clear institutional policies, and deliberate strategies to ensure equitable access across diverse socio-economic and technological contexts.

Research Question 3: How can institutional policies and alternative assessment strategies be leveraged to ensure a balance between academic integrity and learner flexibility in NOUN programmes?

Table 3

Descriptive statistics for institutional policies and alternative assessment strategies

Statements	Mean (X)	SD	Remark
Clear institutional policies support integrity in online assessments	3.7	0.76	Agree
Alternative assessments (projects, portfolios) complement remote proctoring	3.9	0.72	Agree
Policies balance academic integrity with learner flexibility	3.4	0.85	Neutral
Institutional support encourages adoption of both proctoring and alternatives	3.6	0.80	Agree
Overall, institutional strategies enhance credibility of NOUN programmes	3.8	0.74	Agree

SD=Standard Deviation, Decision Mean=3.5
Source: Fieldwork, 2025

Table 3 investigated how institutional policies and alternative assessment strategies can be leveraged to balance academic integrity with learner flexibility. The findings suggest that institutional policies and alternative assessment strategies play a pivotal role in supporting academic integrity while maintaining learner flexibility in NOUN programmes. The moderate agreement on clear policies (X = 3.7) indicates that while frameworks exist to guide online assessments, there is room for improvement in policy clarity, enforcement, and dissemination to ensure consistent adherence across faculties. The positive perception of alternative assessments complementing remote proctoring (X = 3.9) highlights that integrating projects, portfolios, and other innovative methods can enhance both fairness and meaningful learning outcomes, reducing over-reliance on surveillance-based assessments. Respondents' moderate agreement that policies balance integrity with flexibility (X = 3.5) underscores the need for better alignment between assessment rigour and learner-centred approaches, ensuring that flexibility does not compromise quality. Administrative support, although present (X = 3.6), varies across departments, suggesting governance gaps that may affect consistent implementation. These findings imply that strengthening institutional policies,

promoting the systematic integration of alternative assessment strategies, and enhancing administrative coordination across faculties and study centres are critical to safeguarding assessment integrity, improving implementation consistency, and fostering an equitable, flexible, and credible distance education system at the National Open University of Nigeria.

Thematic Interpretation of Qualitative Findings

The findings from the interview reveal a complex interplay of factors influencing the implementation and impact of remote proctoring on assessment integrity and student learning experiences in NOUN programmes. Stakeholders recognised that remote proctoring enhances assessment fairness, reduces opportunities for academic dishonesty, and improves the reliability of results. Students reported that proctoring positively influences their learning experiences, though some anxiety associated with monitoring was noted. This confirms that remote proctoring contributes meaningfully to assessment integrity whileprovidingf assuranceaboutg the credibility of distance education qualifications.

However, the benefits of remote proctoring are tempered by multiple interrelated complexities. First, technological constraints, notably unstable internet connectivity, limited access to suitable devices, and uneven digital literacy, emerged as a major barrier. Students highlighted difficulties in accessing proctoring platforms consistently, while lecturers noted that technical failures sometimes compromised the assessment process. These challenges highlight the equity gap inherent in technology-mediated assessment within a developing country context.

Second, ethical concerns were pronounced. Continuous monitoring during assessments raises issues of privillance, and data protection, with student concernss expressing discomfort over the intruwith nature of some proctoring methods. These findings suggest that while integrity is enhanced, the ethical implications of remote supervision must be carefully managed to maintain learner trust and autonomy. Third, there is evidence of pedagogical misalignment. Remote proctoring tends to reinforce traditional examination formats rather than supporting competency-based or alternative assessments, especially given implementation practices. Although stakeholders acknowledged the potential of projects, portfolios, and other innovative strategies to complement proctoring, the integration of these methods remains limited, reflecting a gap between technological capability and pedagogical design. Finally, governance gaps influence the effectiveness of remote proctoring. Inconsistent institutional policies, limited staff training, and variable administrative support were reported as barriers to full implementation. While institutional strategies support academic integrity, moderate agreement levels suggest that policy enforcement and capacity-building efforts are uneven across faculties and programmes.

Discussion

This study examined the impact of remote proctoring on assessment integrity and student learning experiences at the NOUN, as well as the technical, ethical, pedagogical, and institutional challenges shaping its implementation. The findings present a nuanced picture that both aligns with and extends existing literature on technology-mediated assessment in ODL, particularly within developing-country contexts.

In line with previous studies, students generally perceived remote proctoring as enhancing fairness, reducing opportunities for academic dishonesty, and improving the credibility of examination outcomes. This finding is consistent with evidence suggesting that online proctoring can replicate elements of traditional invigilation and strengthen public confidence in ODL qualifications (Daniel & Gwary, 2022; OECD, 2020). The agreement with these studies reinforces the argument that surveillance-enabled assessment can address long-standing concerns about academic integrity in distance education. However, unlike studies that portray remote proctoring as largely unproblematic once implemented, this study reveals a more ambivalent learner experience.

Although most students acknowledged the integrity benefits of remote proctoring, reports of anxiety associated with continuous monitoring point to a partial divergence from more optimistic accounts in the literature, similar concerns have been noted in studies highlighting the psychological effects of online surveillance, including heightened test anxiety and discomfort (Bashiru & Odu, 2021). Importantly, this study extends those findings by showing that anxiety does not necessarily lead to outright rejection of remote proctoring. Instead, students appear to negotiate a trade-off between enhanced fairness and psychological discomfort, suggesting conditional acceptance rather than uniform endorsement. This finding complicates assumptions that perceived usefulness alone guarantees positive learning experiences.

Technological constraints emerged as a significant moderating factor, consistent with earlier research emphasising infrastructure as a determinant of equitable access in online assessment (UNESCO, 2021; Ally, 2019). Unstable internet connectivity and limited access to appropriate devices were found to exacerbate inequities, particularly for learners in less-resourced settings. While these findings align with dominant narratives in the literature, they also suggest that students' perceptions of fairness are shaped not only by the availability of technology but also by the consistency and transparency of assessment conditions. This indicates that institutional arrangements and policy clarity may mitigate, though not eliminate, infrastructural limitations.

Ethical concerns related to privacy, data protection, and continuous monitoring featured prominently in the findings, reinforcing prior studies' findings (Olojede, 2019; iNACOL, 2020). However, rather than presenting ethics as a binary barrier to acceptance, the findings suggest a more complex relationship. Students and faculty appear willing to tolerate a degree of surveillance when it is perceived as proportionate, clearly regulated, and justified by integrity goals. Conversely, unclear data governance and weak communication amplify distrust. This finding diverges from the literature, which frames learners as either resistant or compliant, highlighting the importance of institutional trust and ethical safeguards in shaping acceptance.

Pedagogical challenges further illuminate tensions identified in earlier studies on ODL assessment. Consistent with Jegede (2016), the findings indicate that inadequate faculty training and misalignment between remote proctoring systems and competency-based assessment approaches can undermine assessment quality. At the same time, strong support for alternative assessment strategies, such as portfolios and project-based evaluations, aligns with arguments that authentic assessment promotes meaningful learning and reduces overreliance on surveillance (Idialu, 2013; Adelakun, 2020). This supports claims that academic integrity is more sustainably achieved through diversified assessment ecosystems than through proctoring technologies alone.

Institutional policies and administrative coordination emerged as critical mediating factors. While existing policies provide a framework for online assessment, gaps in clarity, enforcement, and dissemination limit their effectiveness (Akindele et al., 2024). This finding aligns with studies emphasising the role of governance in sustaining assessment quality (Ally, 2019; Okonkwo, 2011), but it also highlights that policy presence does not guarantee uniform implementation. Variations in administrative support across departments reflect governance gaps that can weaken otherwise sound assessment reforms (Akande & Akuchie, 2022).

Conclusions

This study demonstrates that remote proctoring enhances assessment integrity and supports positive learning experiences in NOUN programmes, particularly within the Faculty of Computing, where technology-mediated assessments are prevalent. Despite its perceived benefits in promoting fairness, reducing academic dishonesty, and improving assessment reliability, its effectiveness is moderated by technological constraints, ethical concerns, pedagogical misalignment, and inconsistent institutional

governance. The findings highlight the need for a balanced assessment ecosystem that combines remote proctoring with alternative strategies such as portfolios and project-based assessments. Strengthening digital infrastructure, building faculty capacity, clarifying institutional policies, and embedding robust ethical safeguards are essential for ensuring equitable, credible, and learner-centred assessment practices in ODL contexts. Further studies should investigate the long-term pedagogical and psychosocial effects of hybrid assessment models across multiple faculties and ODL institutions to enhance transferability, inform policy refinement, and support scalable assessment innovation.

Recommendations

Based on the study findings, the following recommendations are proposed:

1. Digital infrastructure and access should be improved in NOUN. Unequal internet connectivity and limited devices were significant barriers; the university should invest in reliable connectivity, provide subsidised devices, and adopt low-bandwidth-friendly proctoring solutions to ensure all students can participate effectively.
2. Ethical guidelines and data protection measures must be strengthened. Students expressed concerns about privacy and surveillance, indicating the need for clear policies on monitoring, data storage, and usage, coupled with education on learners' rights to maintain trust and autonomy.
3. Faculty capacity should be enhanced through regular training on remote proctoring tools, assessment design, and digital literacy, ensuring consistent and effective implementation.
4. Alternative assessments such as portfolios, projects, and authentic tasks should complement proctoring, balancing integrity with meaningful, flexible learning while reducing over-reliance on surveillance.
5. Institutional policies and governance frameworks should be clarified and consistently applied. Coordinated administrative support and regular policy review will ensure uniform implementation, address challenges promptly, and reinforce the credibility of NOUN programmes.

Suggestions for Future Research

Building on the findings of this study, future research should empirically examine the availability, accessibility, and utilisation of digital infrastructure across faculties and study centres of the National Open University of Nigeria (NOUN), with particular attention to how infrastructural disparities shape assessment integrity outcomes. Comparative studies across technologically intensive and less-resourced faculties would provide deeper insights into the extent to which infrastructure mediates the effectiveness of remote proctoring and other technology-enabled assessment practices. Such investigations could employ mixed-methods designs to correlate infrastructure readiness indicators, such as bandwidth stability, device availability, platform reliability, and technical support, with measurable integrity outcomes, including incidence of academic misconduct and student perceptions of fairness.

Longitudinal studies are also recommended to assess how sustained investments in digital infrastructure influence assessment reliability, learner engagement, and trust in e-assessment systems over time. In addition, future research should explore the differential experiences of undergraduate and postgraduate students, as well as urban and rural study centres, to capture contextual variations in infrastructure use and assessment practices. Beyond NOUN, comparative cross-institutional studies involving other open and distance learning (ODL) universities in Nigeria and similar developing-country contexts would enhance the transferability of findings and inform national policy on digital assessment governance. Further inquiry into the ethical, psychosocial, and accessibility implications, particularly for students with limited digital literacy or special needs, would also strengthen the evidence base for inclusive, integrity-driven assessment frameworks in ODL systems.

Further studies should examine the long-term effects of remote proctoring on learner performance and retention; compare practices across ODL institutions in West Africa; explore students' psychological and privacy concerns; assess cost-effectiveness and sustainability; investigate alternative authentic assessment strategies; and analyse institutional and ethical policy frameworks guiding digital assessment in ODL contexts.

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Conflict of Interest

The authors of this study, "Remote Proctoring and Assessment Integrity in National Open University of Nigeria Programmes: Complexities and Implications for Reform," which has been submitted for publication in the Futurity Journal, Olugbenga Timothy Ajadi, Amos Iliya, and Felix Kayode Olakulehin, declare that they have no competing interests.

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