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Perceived Effectiveness and Suitability of Pen-and-Paper Versus Online Assessments among Students and Academic Staff in Tertiary Institutions in Kaduna State, Nigeria

Abdullahi Umar Suleiman[1]; Mahmud Muhammed Shuaibu[2]; & Hauwa Bello Sharif[3]

[1]Department of Applied Science, Shehu Idris College of Health Sciences and Technology, Makarfi, Kaduna State, Nigeria. [2]Office of the Provost, Shehu Idris College of Health Sciences and Technology, Makarfi, Kaduna State, Nigeria. [3]Department of Applied Biology, School of Applied Sciences, Kaduna Polytechnic, Kaduna, Kaduna State.
Corresponding Author: abdullahiumarsuleimann@gmail.com
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Abstract

Assessment practices in higher education are evolving with the integration of digital technologies, particularly after the COVID-19 pandemic. This study investigates perceptions of students and academic staff regarding pen-and-paper and online assessments in tertiary institutions in Kaduna State, Nigeria. Using a descriptive survey design, data were collected from 267 respondents across universities, polytechnics, and colleges of education through a structured questionnaire and analyzed with descriptive statistics. Results show that pen-and-paper assessments are valued for reliability, fairness, and suitability in testing higher-order cognitive skills, with over 70% of respondents reporting positive experiences. Online assessments, however, were praised for efficiency, rapid feedback, and convenience, and considered most suitable for large classes (37.3%) and theory-based courses, though less effective in practical and problem-solving contexts (6.5%). Concerns about academic integrity, infrastructure, and digital competence were noted, with students showing greater acceptance than staff. The study concludes that assessment effectiveness is context-dependent and recommends a hybrid approach that strategically integrates both modes to optimize outcomes and strengthen tertiary education systems.

Keywords: Assessment effectiveness; Online assessment; Pen-and-paper examination; Higher education; Student perception; Academic staff; Hybrid assessment; Digital education; Nigeria; Tertiary institutions

Introduction

Assessment remains a central component of the teaching–learning process in higher education, serving not only as a mechanism for measuring learning outcomes but also as a driver of student engagement and instructional effectiveness. Traditionally, pen-and-paper examinations have dominated assessment practices due to their perceived reliability, familiarity, and ease of administration. However, the rapid expansion of digital technologies accelerated by the COVID-19 pandemic has led to increased adoption of online and computer-based assessments across higher education systems globally and in Nigeria (Ebohon et al., 2021; Cranfield et al., 2021). This shift has generated renewed scholarly interest in evaluating the relative effectiveness and suitability of these assessment modes.

Empirical evidence suggests that online assessments offer several advantages, including flexibility, scalability, immediate feedback, and enhanced data management (Zakariya et al., 2026; Moemeke & Mughele, 2026). Studies conducted in Nigerian and broader Sub-Saharan African contexts indicate that students often perceive computer-based testing as efficient and convenient, particularly when supported by adequate technological infrastructure and digital literacy (Kuliya & Usman, 2021; Abdulkadir & Hassan, 2026). Similarly, lecturers acknowledge the potential of online assessments to improve administrative efficiency and align with contemporary digital transformation agendas in higher education (Ukeje et al., 2026; Nnaji et al., 2026).

Despite these advantages, the effectiveness of online assessment remains contested. Concerns persist regarding issues such as academic integrity, unreliable internet connectivity, limited access to devices, and insufficient technical competence among both students and staff (Ajadi et al., 2026; Amusa & Agbanimu, 2026). Empirical studies reveal that these constraints significantly shape perceptions of effectiveness, often leading stakeholders to prefer traditional pen-and-paper examinations in contexts where digital infrastructure is inadequate (Zakariya et al., 2026; Kuliya & Usman, 2021). Furthermore, evidence suggests that while online assessments may enhance efficiency, they may not always provide equivalent levels of perceived fairness, depth of cognitive evaluation, or examination security compared to conventional methods (Ayanbode et al., 2022; Jekayinfa et al., 2026).

Importantly, recent literature emphasizes that the effectiveness of any assessment mode is context-dependent rather than universally determined. Factors such as institutional capacity, discipline-specific requirements, student demographics, and cultural attitudes toward technology significantly influence both perceived effectiveness and actual learning outcomes (Gold et al., 2025; Soko, 2026). In developing contexts, including Nigeria, disparities in infrastructure and digital readiness across institutions further complicate the adoption and evaluation of online assessments (Terver et al., 2026; Odularu, 2026). Consequently, a binary comparison between pen-and-paper and online assessments may be overly simplistic, necessitating a more nuanced understanding of the contexts in which each mode is most suitable.

Within Kaduna State, Nigeria, tertiary institutions including universities, polytechnics, and colleges of education exhibit considerable diversity in technological resources, institutional cultures, and student populations. However, there is limited empirical research that simultaneously examines the perceptions of both students and academic staff regarding the effectiveness of pen-and-paper versus online assessments within this context. Existing studies in Nigeria tend to focus on either technological adoption or isolated stakeholder experiences, thereby overlooking the interplay between assessment modes and contextual suitability (Moemeke & Mughele, 2026; Nnaji et al., 2026). Against this backdrop, this study investigates the perceived effectiveness of pen-

and-paper and online assessments among students and academic staff in tertiary institutions in Kaduna State, with particular emphasis on identifying the contexts in which each assessment mode is most appropriate. By integrating perspectives from multiple stakeholders and institutional types, the study aims to contribute context-sensitive, evidence-based insights to inform assessment policy, practice, and digital transformation strategies in Nigerian higher education.

The expansion of online and computer-based assessment in higher education has transformed evaluation practices, yet its perceived effectiveness relative to traditional pen-and-paper examinations remains inconclusive. Evidence indicates that while digital assessments offer efficiency and rapid feedback, concerns persist regarding reliability, academic integrity, technological constraints, and user readiness (Zakariya et al., 2026; Moemeke & Mughele, 2026). In Nigeria, pen-and-paper assessment continues to be widely trusted for its familiarity and perceived credibility, despite increasing institutional shifts toward digital alternatives (Ikechukwu & Nwangwu, 2026).

Existing studies further suggest that perceptions of effectiveness differ between students and academic staff and are influenced by factors such as digital competence, infrastructure, and disciplinary context (Okonkwo & Onyinyechi, 2026; Adenuga & Mbarika, 2019). However, current literature remains fragmented, often focusing on single institutions or stakeholder groups, with limited comparative analysis of both assessment modes within diverse institutional settings.

This gap is pronounced in Kaduna State, where variations in institutional capacity and learning environments may shape the suitability of assessment methods. The lack of context-specific, empirical evidence constrains informed policy and practice. This study therefore examines the perceived effectiveness of pen-and-paper and online assessments among students and academic staff, with particular attention to their contexts of suitability in tertiary institutions in Kaduna State, Nigeria.

RESEARCH QUESTION

1. How do students and staff rate their overall experience with pen-and-paper assessments?
2. In what contexts are online assessments considered most suitable?

AIMS AND OBJECTIVES

This study therefore examines the perceived effectiveness of pen-and-paper and online assessments among students and academic staff, with particular attention to their contexts of suitability in tertiary institutions in Kaduna State, Nigeria. The specific objectives that guided this Study include:

1. To assess the overall experience of students and staff with pen-and-paper assessments.
2. To determine contexts in which online assessments are considered most appropriate.

Conceptualizing Assessment Effectiveness in Higher Education

Assessment effectiveness is commonly evaluated in terms of validity, reliability, fairness, accessibility, and alignment with learning outcomes. Comparative studies indicate that both online and traditional assessments can achieve these benchmarks under appropriate conditions, though their strengths differ.

Wilson (2020) demonstrates that while e-assessment enhances efficiency and rapid feedback, traditional pen-and-paper assessments often provide stronger perceived validity in evaluating higher-order cognitive skills. Similarly, Thathsarani et al. (2023) found that online assessments can effectively measure academic achievement but require robust design and monitoring mechanisms to ensure quality and credibility. These findings highlight that effectiveness is not inherent in the mode itself but contingent on implementation quality.

Perceived Effectiveness of Online Assessments

Empirical studies across Africa and beyond suggest that online assessments are increasingly perceived as effective due to their flexibility, speed, and adaptability. Moemeke and Mughele (2026), in a Nigerian case study, report that digital assessments can accurately measure learning outcomes, particularly in structured and objective testing formats. Likewise, Ebrahim et al. (2026), through a systematic review, emphasize that online assessment systems enhance accessibility and support diverse learning environments, especially in distance education contexts.

However, perceptions of effectiveness are often moderated by technological readiness and user competence. Adenuga and Mbarika (2019) highlight that computer anxiety and limited technical support significantly reduce students' acceptance of e-assessment in Sub-Saharan Africa. In a related study, Ajadi et al. (2026) identify concerns around academic integrity, particularly in remote proctored environments, which negatively affect both staff and student confidence in online assessments.

Furthermore, the digital divide remains a critical constraint. Olajide et al. (2026) argue that disparities in internet access, device availability, and ICT skills undermine the perceived fairness and effectiveness of online examinations in Nigeria. These infrastructural challenges are particularly pronounced in public institutions, thereby influencing stakeholder preferences.

Perceived Effectiveness of Pen-and-Paper Assessments

Despite technological advancements, pen-and-paper assessments remain widely used and are often perceived as more credible and less susceptible to malpractice. Ikechukwu and Nwangwu (2026) note that traditional assessments continue to dominate Nigerian tertiary institutions due to their perceived reliability and institutional familiarity.

Studies also suggest that handwritten examinations are better suited for subjective, analytical, and practical evaluations, where demonstration of reasoning processes is essential. Agama (2026) argues that certain disciplines such as law and other practice-oriented fields may not be effectively assessed through digital formats, thereby reinforcing the continued relevance of traditional methods.

Additionally, staff perceptions often favour pen-and-paper assessments due to concerns about control, invigilation, and standardization. Wabeke (2021) found that lecturers in Nigerian institutions expressed reservations about transitioning fully to digital assessments, citing issues of monitoring and academic dishonesty.

Comparative Perspectives: Students vs Academic Staff

A recurring theme in the literature is the divergence in perceptions between students and academic staff. Students generally exhibit a higher preference for online assessments, driven by convenience, reduced anxiety, and faster feedback (Reju, 2020; Moemeke & Mughele, 2026). In contrast, academic staff tend to prioritize assessment integrity, rigor, and reliability, leading to a more cautious stance toward online modalities (Ajadi et al., 2026).

This divergence creates a critical tension in assessment policy and practice. Studies indicate that without aligning these perspectives, institutions risk implementing systems that are either technologically advanced but pedagogically weak, or pedagogically sound but technologically outdated.

METHODOLOGY

This study employed a descriptive survey design to examine the perceptions of students and academic staff in tertiary institutions in Kaduna State, Nigeria, regarding the relative preference for online versus

physical handwritten assessments. The design was selected for its suitability in capturing attitudes, opinions, and behavioural tendencies across a large and diverse population, thereby enabling generalizable insights. The study was conducted within Kaduna State, a major educational hub in northwestern Nigeria characterized by a high concentration of universities, polytechnics, and colleges of education. A representative sample of participants was drawn using appropriate sampling techniques to ensure coverage across institutional types and respondent categories. Data were collected using a structured questionnaire designed to elicit standardized responses on assessment preferences. The instrument underwent validation and reliability testing to ensure accuracy and consistency. Ethical considerations, including informed consent and confidentiality, were strictly observed throughout the research process. Data collection followed a systematic procedure, and responses were analysed using quantitative methods to generate descriptive and inferential statistics, providing an evidence-based understanding of assessment preferences within the study context.

RESULTS

The demographic characteristics of respondents provide a contextual foundation for interpreting the study findings. A total of 267 respondents comprising both students and academic staff participated in the study. The gender distribution shows a slightly higher proportion of males 160 (59.9%) compared to females 107 (40.1%), indicating a moderately male-dominated sample, though still reflective of a relatively balanced representation within tertiary institutions in Kaduna State.

The age distribution reveals that the majority of respondents are within the youthful segment of the academic population, with 144 (53.9%) falling within the 20–25 years category. This is followed by 48 (18.0%) aged 41 years and above, while smaller proportions are distributed across 31–35 years (10.5%), 26–30 years (9.7%), and 36–40 years (7.9%). This pattern reflects a predominantly young student population alongside a smaller proportion of senior academic staff.

In terms of institutional representation, respondents were drawn across diverse tertiary institutions using a stratified sampling approach. Universities accounted for 11.1%, polytechnics 22.2%, colleges of education 11.1%, and other specialized institutions 33.3%, ensuring broad institutional coverage and enhancing the representativeness of the study.

For students, the distribution across levels of study indicates higher participation at the lower and mid-undergraduate levels, with 200 level students constituting 30.3% and 100 level 27.2%. Other categories include 300 level (14.9%), 400 level (9.2%), postgraduate students (13.3%), Pre-HND (3.6%), and Pre-ND (1.5%), suggesting strong representation of foundational academic levels.

Among academic staff, respondents exhibited a wide range of academic and professional ranks, reflecting institutional diversity. Lecturer I had the highest representation (12%), followed by Lecturer III (10.7%), Senior Lecturer (9.3%), Assistant Lecturer (8%), Lecturer II (5.3%), and Chief Nurse Educator (5.3%), while other ranks such as technologists, instructors, and administrative academic officers each accounted for between 1.3% and 4%. Overall, the demographic distribution indicates a heterogeneous sample that adequately captures perspectives across gender, age, institutional type, academic level, and staff rank.

How do students and staff rate their overall experience with pen-and-paper assessments?

The experiences of students and staff with traditional pen-on-paper assessments vary across different levels of satisfaction. A small proportion of participants reported negative experiences, with 3.5% describing their experience as very poor and another 3.5% rating it as poor.

A larger segment, 21.5%, indicated a fair experience, suggesting that while pen-on-paper assessment is familiar, it may come with certain limitations or inconveniences for some users.

The majority of respondents, however, expressed positive experiences. 44.2% rated pen-on-paper assessment as good, reflecting general satisfaction with its clarity, simplicity, and reliability. Additionally, 27.3% rated their experience as excellent, showing strong preference and comfort with the traditional assessment method.

Overall, the findings suggest that while pen-on-paper assessment has some challenges for a minority of users, it remains a widely accepted and positively perceived method among staff and students.

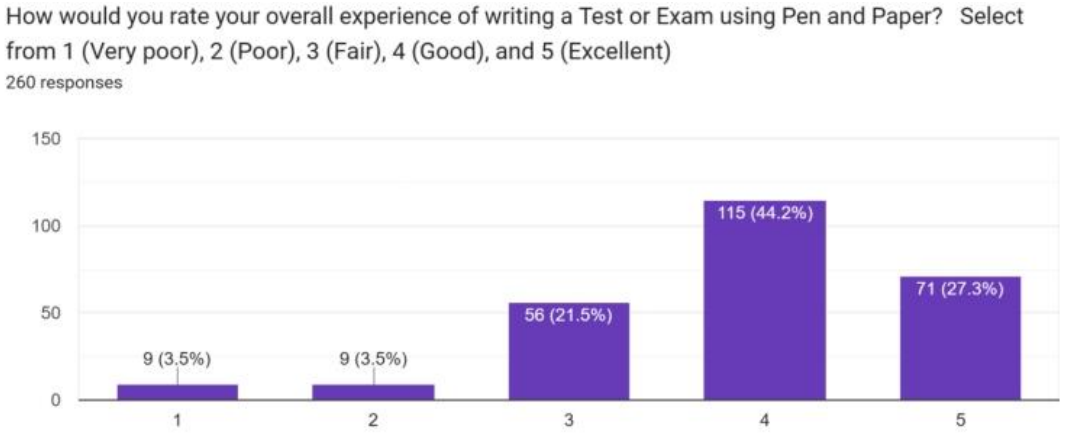


Figure 1. Distribution of the participants' experience on the traditional pen-on-paper assessment method

Research Question 2:

In what contexts are online assessments considered most suitable?

The responses from students and staff indicate varying levels of perceived suitability of online assessment across different academic contexts. Only 10.4% believe online assessment is most suitable for small classes, while a larger proportion, 37.3%, consider it suitable for large classes, where digital administration may ease coordination and reduce logistical challenges. A further 16.9% find online assessment appropriate primarily for theoretical classes, suggesting alignment with content that requires conceptual understanding rather than hands-on demonstration.

Conversely, only 6.5% view online assessment as suitable for practical or problem-solving classes, highlighting concerns about the ability of online formats to effectively measure applied skills. Notably, 28.8% of respondents believe that online assessment is suitable across all listed contexts, indicating a significant level of overall confidence in the adaptability and flexibility of online assessment methods.

Table 1: Areas of suitability of Online Assessment

Statement	**Students and Staff**	
	Frequency	**Percentage**
Small Classes	27	10.4%
Large classes	97	37.3%
Theoretical Classes	44	16.9%
Practical/Problem-solving Classes	17	6.5%
All of the above options	75	28.8%
Total	260	100%

DISCUSSION OF FINDINGS

The findings of this study provide a nuanced understanding of the perceived effectiveness of pen-and-paper and online assessment modes among students and academic staff in tertiary institutions in Kaduna State, Nigeria. Overall, the results reinforce the growing consensus in the literature that assessment effectiveness is not inherent to a particular mode but is strongly shaped by contextual, infrastructural, and pedagogical factors.

First, the overwhelmingly positive perception of pen-and-paper assessments (with over 70% rating their experience as good or excellent) aligns with longstanding evidence that traditional examination formats remain deeply institutionalized and widely trusted within Nigerian higher education. This finding corroborates earlier studies which emphasize the perceived reliability, fairness, and credibility of handwritten assessments, particularly in contexts where technological systems are inconsistent or underdeveloped (Ikechukwu & Nwangwu, 2026; Ukwueze & Eya, 2018). The continued preference for pen-and-paper assessment may also reflect its suitability for evaluating higher-order cognitive skills, especially in disciplines requiring extended written responses and logical argumentation (Wilson, 2020). Furthermore, staff confidence in traditional invigilation methods likely reinforces this preference, given persistent concerns about academic dishonesty in digital environments (Ajadi et al., 2026).

However, the findings also reveal that online assessment is perceived as highly suitable in specific contexts, particularly for large classes (37.3%). This supports empirical evidence that computer-based testing enhances administrative efficiency, scalability, and logistical convenience, making it especially advantageous in mass education settings (Ebimgbo et al., 2021; Moemeke & Mughele, 2026). The ability of online systems to automate grading and provide rapid feedback further strengthens their appeal in such contexts, as highlighted in broader global and African studies (Ebrahim et al., 2026; Cranfield et al., 2021). Notably, the proportion of respondents (28.8%) who consider online assessment suitable across all contexts suggests a growing acceptance of digital modalities, likely influenced by increased exposure during the COVID-19 pandemic.

Despite these advantages, the relatively low endorsement of online assessment for practical or problem-solving classes (6.5%) underscores persistent limitations in its perceived pedagogical effectiveness. This finding is consistent with literature suggesting that digital assessments may struggle to adequately capture applied competencies, procedural knowledge, and complex reasoning processes (Agama, 2026; Thathsarani et al., 2023). It also reflects concerns about the authenticity and integrity of online examinations, particularly in unsupervised or poorly proctored environments (Osang, 2012; Ajadi et al., 2026). Such limitations highlight the importance of aligning assessment modes with disciplinary requirements and learning objectives.

Importantly, the findings illustrate a subtle but significant shift toward a hybrid understanding of assessment effectiveness. While pen-and-paper methods remain dominant in terms of overall satisfaction, online assessments are increasingly recognized for their contextual advantages. This supports the argument advanced in recent scholarship that a binary comparison between traditional and digital assessment is overly simplistic; instead, a complementary approach that integrates both modalities may yield optimal outcomes (Olanike et al., 2023; Zakariya et al., 2026).

Furthermore, the results reflect underlying structural realities within the Nigerian higher education system, particularly the influence of infrastructural disparities and digital readiness. Studies consistently show that access to reliable internet, adequate devices, and technical support significantly shapes

perceptions of online assessment effectiveness (Adenuga & Mbarika, 2019; Olajide et al., 2026). In contexts such as Kaduna State, where institutional capacities vary widely, these factors likely contribute to the cautious but evolving acceptance of online assessment.

In sum, the study demonstrates that while traditional pen-and-paper assessments continue to enjoy strong legitimacy and user confidence, online assessments are gaining traction as context-specific alternatives, particularly in large-class and theory-based settings. The findings therefore underscore the need for a balanced, context-sensitive assessment strategy that leverages the strengths of both modalities while addressing their respective limitations through improved infrastructure, capacity building, and assessment design.

CONCLUSION

This study examined the perceived effectiveness of pen-and-paper and online assessments among students and academic staff in tertiary institutions in Kaduna State, Nigeria, revealing that assessment effectiveness is fundamentally context-dependent rather than mode-specific. The findings show that pen-and-paper assessments remain widely trusted and positively perceived, largely due to their reliability, familiarity, and suitability for evaluating higher-order cognitive skills. This enduring preference reflects both institutional tradition and ongoing concerns about technological limitations and academic integrity in digital environments. At the same time, online assessments are increasingly recognized for their advantages in specific contexts, particularly in large classes where efficiency, scalability, and rapid feedback are essential. However, their limited perceived suitability for practical and problem-solving tasks highlights ongoing concerns about their capacity to assess applied competencies effectively and maintain examination integrity. Importantly, the study points toward a shift from a binary comparison of assessment modes to a more integrative perspective. The growing acceptance of online assessments alongside the continued dominance of traditional methods suggests that a hybrid approach combining the strengths of both modalities is most appropriate for optimizing assessment outcomes. Overall, the study underscores the need for context-sensitive assessment strategies that align with institutional capacity, disciplinary requirements, and technological readiness. Enhancing infrastructure, digital literacy, and assessment design will be critical to maximizing the effectiveness of online modalities. A balanced, hybrid framework therefore offers the most practical pathway for improving assessment quality, equity, and adaptability in Nigerian higher education.

RECOMMENDATION

- **i.** Adopt a hybrid assessment approach that combines pen-and-paper for practical and higher-order tasks with online methods for large and theory-based classes.
- **ii.** Improve digital infrastructure by ensuring reliable internet, power supply, and technical support for smooth online assessment delivery.
- **iii.** Strengthen digital skills through regular training for staff and students on effective use and design of online assessments.
- **iv.** Enhance assessment integrity by using secure platforms, proctoring tools, and alternative assessment designs to minimize malpractice and ensure quality.

Ethical consideration

The ethical guidelines for the study on online versus physical assessments in Kaduna State, led by Abdullahi Umar Suleiman and approved by the Kaduna State Bureau of Statistics (KDBS), emphasize

adherence to the approved methodology and locations. Participation is voluntary, with informed consent required before data collection, while confidentiality must be maintained. Any changes to the study design must receive prior KDBS approval. The final research report and anonymized dataset must be submitted to KDBS, and additional permissions may be needed from relevant authorities. KDBS can withdraw approval for non-compliance, ensuring accountability and adherence to governance protocols.

REFERENCES

Abdulkadir, S., & Hassan, Y. A. (2026). *Impact of ICT literacy on technology adoption in Nigerian higher education*. International Journal of Education and Management Engineering. https://sciup.org/file/15020333/IJEME-V16-N2-4.pdf

Abubakar, M., Ogunjimi, M. O., & Yahaya, U. U. (2025). University lecturers' perception and implementation of online assessment strategies in North-Eastern Nigeria. *Nigerian Journal of Educational Foundations*. https://nijef.org.ng/issue/vol_25_no_1/82-93.pdf

Adenuga, K. I., & Mbarika, V. W. (2019). Technical support and e-assessment acceptance in Sub-Saharan Africa. In *IFIP Advances in Information and Communication Technology*. Springer.

Adenuga, K. I., & Mbarika, V. W. (2019). Technical support: Towards mitigating effects of computer anxiety on acceptance of e-assessment amongst university students in Sub-Saharan Africa. In *IFIP Advances in Information and Communication Technology*. Springer. https://link.springer.com/chapter/10.1007/978-3-030-20671-0_5

Adewumi, A. A., & Pitan, O. S. (2022). Nigerian law students' perception of online teaching: Appraisal of COVID-19-imposed online classes. *Asian Journal of Legal Education*. https://journals.sagepub.com/doi/10.1177/23220058211061915

Agama, F. O. (2026). Suitability of e-assessment in legal education. *NAU Journal of Legal Studies and Clinical Legal Education*. https://www.journals.ezenwaohaetorc.org/index.php/NAU-JLCLE/article/view/3774

Ajadi, O. T., Iliya, A., & Olakulehin, F. K. (2026). Remote proctoring and assessment integrity in higher education. *Futurity Education*. https://futurity-education.com/index.php/fed/article/view/564

Ajadi, O. T., Iliya, A., & Olakulehin, F. K. (2026). Remote proctoring and assessment integrity in higher education. *Futurity Education*. https://futurity-education.com/index.php/fed/article/view/564

Ayanbode, O. F., Fagbe, A., Owolabi, R., & Oladipo, S. (2022). Students' interactions and perceived progress in online learning. *Cogent Education, 9*(1).

Cranfield, D. J., Tick, A., Venter, I. M., & Blignaut, R. J. (2021). Higher education students' perceptions of online learning during COVID-19. *Education Sciences, 11*(8), 403.

Ebimgbo, S. O., Igwe, N. J., & Okafor, A. E. (2021). Perceived effectiveness of computer-based test for large classes in Nigerian universities. https://www.researchgate.net/publication/351188639

Ebohon, O., Obienu, A. C., Irabor, F., & Amadin, F. I. (2021). Evaluating the impact of COVID-19 pandemic lockdown on education in Nigeria: Insights from teachers and students on virtual/online learning. *SN Social Sciences, 1*, 1–21.

Ebrahim, O. O., El Mhouti, A., & Allaoui, M. (2026). Assessing distance learning in digital environments: A systematic review. *Journal of Educators Online*. https://eric.ed.gov/?id=EJ1499134

kemezie, E. (2025). Online learning and quality education delivery in tertiary institutions in Anambra State, Nigeria. *African Journal of Applied Research*. https://mail.ajaronline.com/index.php/AJAR/article/view/1290

Eze, E. C., Okafor, I. G., & Ngwu, L. C. (2020). Effects of computer-based multimedia testing on social studies undergraduates' academic achievement and retention. *Pedagogical Technology Studies*. https://www.pedtechs.com/download/effects-of-computer-based-multimedia-testing-on-social-studies-undergraduates-academic-achievement-18022.pdf

Ibrahim, A. W., Taura, A. A., & Iliyasu, A. (2023). Digitalising educational assessments in a Nigerian university: An examination of undergraduate students' digital behaviours and experiences. *Journal of Teaching and Learning*. https://www.researchgate.net/publication/372885216

Ikechukwu, B. N., & Nwangwu, E. C. (2026). Computer educators' perception of e-assessment in public universities in Enugu State. *University Journal of Educational Research and Development*. https://unilaws.org/ujervs/article/view/268

Inobemhe, K., & Ismaila, A. (2026). Adoption and utilization of e-learning in Nigerian tertiary institutions. *European Journal of Innovative Methods in Education*. https://www.ejimed.com/download/adoption-and-utilization-of-e-learning-for-learning-in-select-tertiary-institutions-in-kogi-state-17950.pdf

Iserom, I. C., Diwa, O. B., & Ofem, U. J. (2025). Students' perception of biometric technology in e-assessment: Unearthing psychological dimensions. *Global Journal of Educational Research*. https://www.ajol.info/index.php/gjedr/article/view/291279

Metu, I. C., Agu, N. N., & Eleje, L. I. (2024). Students' perceptions of and preferences for assessment feedback in higher education. *Futurity of Social Sciences*. https://futurity-social.com/index.php/journal/article/view/37

Moemeke, C. D., & Mughele, E. S. (2026). Effectiveness of digital assessment in measuring science learning outcomes in higher education institutions in Nigeria. *Research Square (Preprint)*. https://www.researchsquare.com/article/rs-9065428/latest

Okonkwo, E. C., & Onyinyechi, O. H. (2026). Teachers' application of online continuous assessment in curbing test malpractice among economics students in Nigeria. *Journal of Theoretical and Empirical Studies in Education*. https://journals.unizik.edu.ng/jtese/article/download/7837/6630

Olajide, B., Ojakorotu, V., & Solomon, T. (2026). Digital divide and e-examinations in Nigeria. *International Journal of Sustainable and Innovative Education*. https://journals.co.za/doi/abs/10.4314/ijsie.v1i1.14s

Olanike, S., Asogwa, C. N., & Njideka, M. (2023). Comparison of perceptions of assessment practices between staff and students. https://www.ijsses.tiu.edu.iq/index.php/ijsses/article/view/42

Olumide, H. A., Isaiah, A. O., & Akinbola, A. M. (2024). Application of online educational tools in Obafemi Awolowo University: Students' perception. *Saudi Journal of Humanities and Social Sciences*. https://saudijournals.com/media/articles/SJHSS_96_205-214.pdf

Orok, E., Okaramee, C., Egboro, B., & Egbochukwu, E. (2024). Pharmacy students' perception and knowledge of chat-based artificial intelligence tools at a Nigerian university. *BMC Medical Education, 24*, Article 6255. https://doi.org/10.1186/s12909-024-06255-8

Osang, F. (2012). Electronic examination in Nigeria: Academic staff perspective. https://www.researchgate.net/publication/280565271

Peni, I., & Muhammad, Z. (2024). Integrating artificial intelligence in students' assessments: Applications, perceptions and implications in a Nigerian university. *Rima International Journal of Education*. https://rijessu.com/wp-content/uploads/2024/06/019-RIJE-2024-V3-0031.pdf

Reju, C. (2020). Comparative assessment practices in online learning environments. *International Journal of Educational Research*. https://www.academia.edu/download/82437878/EJ1255729.pdf

Thathsarani, H., Ariyananda, D. K., & Jayakody, C. (2023). Effectiveness of online assessment in higher education. *Education and Information Technologies*.

Ukwueze, A. C., & Eya, P. E. (2018). Assessment of pen-and-paper examination in distance education. https://wajofel.org/index.php/wajofel/article/view/11

Umar, Y. (2023). Exploring science teachers' perceptions and strategies in navigating online assessment challenges: Lessons from the Nigerian COVID-19 experience. *Learning Science and Mathematics Journal*. http://recsam.edu.my/sub_lsmjournal/images/docs/2023/2023_7_YU_094104.pdf

Wabeke, E. C. (2021). Adoption of e-learning technologies in Nigerian higher education institutions (Doctoral dissertation). ProQuest Dissertations Publishing.

Wilson, K. (2020). A comparison of e-assessment and traditional assessment methods (Master's thesis). https://www.academia.edu/download/126166709/8232100020_KUUKU_NYAMEYE_WILSON_THESIS.pdf

Zakariya, Y. F., Alotaibi, S. B., & Alrashood, J. S. (2026). Computer-based testing in higher education: A phenomenological investigation into undergraduate students' perspectives. *Frontiers in Psychology*. https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2026.1602964/full