INTERNATIONAL JOURNAL OF GENERAL STUDIES EDUCATION (IJOGSE)
VOLUME 7, ISSUE 1, 2026
ISSN: 1462-2032

Investigating the Prospects and Challenges of Computer-Based Testing in North-Eastern Nigeria's Tertiary Institutions

[1]Jacob Philip, [2]Wallace EbinumOssai, [3]Adamu Ahmed Yarma, [4]Bolanle Adejumo and [5]Abdullahi Salami Magaji

[1,2,3,4]Computer Department, [5]Psychology/Guidance and Counselling Department, [1,2,3,4,5]Federal College of Education (Technical), Gombe, Gombe State, Nigeria

Abstract

This study investigated the prospects and challenges of Computer-Based Testing (CBT) in tertiary institutions in North-Eastern Nigeria, focusing on perceived assessment benefits, infrastructural difficulties, CBT-related anxiety and usability concerns, logistical constraints, and differences by institutional ownership and secondary-school locality. A quantitative descriptive survey design was employed. Data were obtained from400 undergraduate students selected fromfour tertiary institutions comprising two Federal and two State-owned institutions. The Prospects and Challenges of Computer-Based Testing Questionnaire (PCCBTQ) contained 13 four-point Likert-type indicators. Because the indicators represent heterogeneous operational experiences rather than interchangeable manifestations of a single latent construct, item-level descriptive statistics were treated as the primary evidence, while composite indices were used only as exploratory summaries. Respondents strongly endorsed the prospects of CBT, with the highest rating for faster processing and release of results (M=3.70, SD = 0.458). Other highly rated prospects included question randomization and examination integrity (M= 3.64), reduction of missing scripts (M=3.60), reduced examiner bias (M= 3.59), and digital-skill enhancement (M= 3.40). Major challenges included lack of mock/orientation sessions (M=3.33), unstable power supply (M= 3.22), hardware difficulties (M= 3.04), timer-related concern (M=2.98), mouse/interface difficulty (M= 2.94), and network latency (M= 2.83). Infrastructure challenges were strongly associated with CBT-related anxiety (Pearson $r = .766$, $p < .001$; Spearman $\rho = .755$, $p < .001$). No significant Federal-State difference was observed in infrastructure challenges, $t(398) = 0.003$, $p = .998$, and no significant urban-rural differences were found in anxiety or disruption indicators. The study concludes that students generally perceive CBT positively, but implementation is constrained by systemic infrastructure and administrative conditions. It recommends mandatory mock CBT sessions, resilient power backup, regular hardware maintenance, network contingency measures, and improved examination scheduling. Keywords: computer-based testing; tertiary education; infrastructural challenges; computer anxiety; examination logistics; digital assessment; North-Eastern Nigeria.

Keywords: prospects, challenges, CBT, North-eastern Nigeria, tertiary institutions

IJOGSE2026

Introduction

Educational assessment performs a central role in measuring learning outcomes, certifying competence, and supporting institutional accountability. The increasing use of digital technologies has shifted assessment practice from paper-and-pencil testing (PPT) toward computer-based testing (CBT), which can support automated scoring, faster result processing, standardized administration, and digital record management. Nigerian tertiary institutions have increasingly adopted CBT for large-cohort examinations, admissions screening, and course assessments as part of the broader digital transformation of higher education (Alabi et al., 2012; Ayo et al., 2007; Onyibe et al., 2015 The appeal of CBT is particularly strong where institutions must manage large numbers of candidates while maintaining consistency and traceability. Randomized item presentation can reduce opportunities for coordinated copying, automated scoring can reduce routine marking variation, and electronic storage can reduce risks associated with physical answer scripts. These potential benefits underpin the growing acceptance of CBT as an assessment model (Abubakar & Adebayo, 2014; Ayo et al., 2007).

However, the benefits of digital assessment depend on the conditions under which CBT is implemented. Reliable electricity, adequate computers and peripherals, stable networks, appropriate server capacity, technical support, and student familiarity with the testing interface are essential. In resource-constrained environments, weaknesses in any of these elements can interrupt an examination and create additional stress for candidates. Nigerian studies have identified infrastructure inadequacy, power instability, connectivity problems, and limited preparation as important barriers to reliable e-assessment (Jimoh et al., 2012; Onyibe et al., 2015; Osuji, 2012).

The psychological dimension is also important. Computer anxiety refers to apprehension or discomfort associated with using computer technology and can become especially salient when computer interaction occurs under time pressure (Heinssen et al., 1987). In a CBT environment, technical problems, unfamiliar navigation, and visible countdown timers may compete with task-focused attention. The present study does not assume that anxiety is an inherent characteristic of students from any particular background; instead, it examines whether reported CBT-related anxiety differs across students with urban and rural secondary-school backgrounds and whether anxiety is associated with reported infrastructure difficulties.

North-Eastern Nigeria provides a useful context for examining these issues because tertiary institutions in the region operate within varied infrastructure and administrative environments.

IJOGSE 2026

Existing Nigerian CBT literature has largely examined individual institutions, general implementation issues, or specific technical challenges. Comparative evidence across Federal and State-owned institutions in the North-East, together with empirical examination of the assumed urban-rural disparity in CBT experiences, remains limited.

Accordingly, this study investigated the prospects and challenges of CBT in selected tertiary institutions in North-Eastern Nigeria. It addressed five linked questions: what prospects do students perceive in CBT; what infrastructural challenges confront CBT operations; what CBT-related anxiety and usability concerns are reported; what logistical constraints affect administration; and whether reported challenges differ by institutional ownership or secondary-school locality. The study was guided by the Technology Acceptance Model (TAM) and the computer-anxiety/cognitive-attentional perspective (Davis, 1989; Wine, 1971; Heinssen et al., 1987).

Statement of the Problem

The existing evidence supports the value of CBT while documenting significant implementation challenges. However, there remains a need for localized, comparative evidence from North-Eastern Nigeria that places perceived benefits, infrastructure, student experience, and institutional context in the same analytical frame. In particular, this study responds to two gaps: limited comparative testing of Federal versus State-owned institutions and limited empirical testing of the assumed rural-urban difference in CBT-related anxiety and disruption. The most recent evidence also reveals a fragmented literature. Recent studies have examined student perceptions in individual states, computer anxiety and digital literacy in specific Nigerian tertiary settings, and infrastructure in particular institutional or professional contexts (Awoleru, 2026; Ezeugo & Nwankwo, 2025; Israel et al., 2024; Zakariya et al., 2026). What remains comparatively less developed is a single regional study that combines perceived CBT prospects, multiple infrastructure and logistics indicators, and comparative testing across Federal and State-owned tertiary institutions in North-Eastern Nigeria. The present study addresses this gap using a 400-student dataset from four institutions.

Literature Review and Theoretical Framework

Prospects of Computer-Based Testing

CBT offers several operational advantages over paper-based assessment. Automated scoring can shorten the time between examination completion and result processing, while electronic data

IJOGSE 2026

storage can improve traceability and reduce the handling of physical scripts. Randomized item presentation can strengthen assessment security by reducing the likelihood that adjacent candidates receive identical question sequences. Nigerian studies have reported perceived advantages relating to efficiency, assessment integrity, and administrative convenience (Ayo et al., 2007; Abubakar & Adebayo, 2014; Alabi et al., 2012).

The perceived usefulness of CBT is therefore not limited to speed. It includes the possibility of reducing routine sources of grading variation, preventing missing-script problems, and developing students'functional digital competence through repeated exposure to computer interfaces. Nevertheless, the presence of CBT technology does not automatically eliminate all forms of malpractice or administrative weakness.

Recent Nigerian evidence reinforces this pattern of conditional acceptance. A 2026 study of undergraduate students in Oyo State reported predominantly positive experiences with CBT, while still recommending adequate facilities as a condition for sustained effectiveness (Awoleru, 2026). A separate 2026 qualitative study of Nigerian university students similarly found that students valued fast grading and reduced administrative errors but identified technical failures, poor facilities, assessment inflexibility, and examination-related stress as constraints on CBT acceptance (Zakariya et al., 2026). These recent studies suggest that positive attitudes toward CBT can coexist with concerns about the reliability and usability of the implementation environment.

Infrastructural and Logistical Challenges

The reliability of CBT depends on a chain of interdependent technical resources. Power supply is especially important because interruptions can affect candidate workstations, local servers, networking equipment, and cooling systems. Hardware condition also matters: unresponsive mice, keyboards, monitors, or other peripherals can interfere with navigation during a timed examination. Connectivity problems can delay loading and submission, particularly when many candidates interact with the system simultaneously. Nigerian literature has identified electricity, ICT facilities, and network reliability as persistent barriers to dependable digital assessment (Jimoh et al., 2012; Onyibe et al., 2015; Osuji, 2012).

Administrative arrangements can introduce a second layer of difficulty. Institutions may have limited computer capacity relative to enrolment, leading to multiple examination batches and waiting queues. Without structured mock examinations or orientation sessions, students may encounter the testing interface for the first time during a high-stakes assessment. Transport and

IJOGSE 2026

security considerations can also become relevant where testing is centralized or where examination shifts require movement at difficult times. The recent literature provides further empirical support for these implementation concerns. In a 2024 Nigerian study of candidates in a computer-based professional nursing examination, 74.3% reported difficulty with long questions under limited time, while faulty computer systems and power outages were also reported; the authors recommended proper testing of systems before examinations and a better CBT environment (Israel et al., 2024). In 2026, Agbajeola et al. reported a significant relationship between CBT infrastructure and undergraduate academic performance in Nigerian Federal universities, further highlighting the importance of infrastructure quality in digital assessment. Together, these studies support examining infrastructure as a substantive component of CBT quality rather than as a peripheral technical issue.

Computer Anxiety, Usability, and Student Background

Computer anxiety refers to negative affective responses associated with computer use (Heinssen et al., 1987). In examination settings, anxiety may be intensified by time pressure, unfamiliarity with the interface, or concern about technical failure. From a cognitive-attentional perspective, anxiety can increase task-irrelevant thoughts and compete for limited attention during performance (Wine, 1971). The present study therefore treats timer panic and mouse/interface difficulty as practical indicators of CBT-related concern rather than as a fully validated clinical or psychometric anxiety scale.

A common assumption in discussions of the digital divide is that students from rural educational backgrounds may report more difficulty using technology because of lower prior exposure. Such an assumption requires empirical testing in contemporary settings where students may have broader access to smartphones and other digital devices than previous cohorts. The present study examines whether students classified by urban or rural secondary-school background differ in reported CBT anxiety and examination disruptions.

Evidence from Anambra State also indicates that digital literacy and test anxiety remain relevant to students' experiences of computer-based examinations. Ezeugo and Nwankwo (2025), using data from 810 undergraduates in public tertiary institutions, found that test anxiety significantly predicted satisfaction with computer-based examinations, while digital literacy and anxiety jointly contributed to variation in satisfaction. Their results strengthen the rationale for considering

IJOGSE 2026

technology familiarity and anxiety together, while also demonstrating the need for adequately validated measurement instruments.

Theoretical Framework

The Technology Acceptance Model (TAM) proposes that perceived usefulness and perceived ease of use shape acceptance of information technology (Davis, 1989). In the present study, perceived usefulness maps onto students' positive assessments of CBT speed, integrity, objectivity, and record safety. Perceived ease of use maps onto navigation, technical reliability, and preparation. Thus, students may perceive CBT as highly useful while simultaneously reporting problems that make the system more difficult to use.

The second framework is the computer-anxiety/cognitive-attentional perspective. Wine (1971) argued that anxiety can redirect attention toward task-irrelevant concerns, while Heinssen et al. (1987) extended the measurement of computer anxiety to interactions with computer technology. In CBT settings, a malfunctioning device, technical delay, or time pressure may increase concern about the medium of testing and reduce attentional comfort. This framework supports examining associations among technical difficulties and anxiety but does not justify causal conclusions from a cross-sectional survey.

Methodology

The study used a quantitative descriptive survey design. The target population comprised undergraduate students in selected tertiary institutions in North-Eastern Nigeria who had participated in at least one CBT examination. A sample of 400 students was obtained from four tertiary institutions selected to represent two Federal and two State-owned institutions. The final sample comprised 193 respondents (48.25%) from Federal institutions and 207 (51.75%) from State-owned institutions. In terms of secondary-school background, 256 respondents (64.0%) were classified as urban-background and 144 (36.0%) as rural-background. A multistage sampling procedure was used. Institutions were purposively selected to represent the ownership categories; the sample was stratified by relevant background characteristics; and respondents were selected within the participating institutions. Data were collected through direct questionnaire administration. Participation was voluntary and the questionnaire did not request names or direct personal identifiers.

Data were collected with the Prospects and Challenges of Computer-Based Testing Questionnaire (PCCBTQ), a structured four-point Likert-type instrument. The substantive portion contained 13

IJOGSE 2026

operational indicators: Q1-Q5 addressed perceived CBT prospects; Q6-Q10 addressed infrastructural and CBT-related difficulties; and Q11-Q13 addressed logistical constraints. Response options ranged fromStrongly Disagree (1) to Strongly Agree (4), with a criterion mean of 2.50 used for descriptive interpretation. The instrument underwent face and content review by the research supervisor and two experts in Measurement and Evaluation.

Cronbach's alpha was initially calculated for the three principal item groupings. The coefficients were .009 for the five-item CBT prospects grouping, .149 for the five-item infrastructure grouping, and .121 for the three item logistics grouping. These values indicate very low internal consistency when the items are treated as interchangeable manifestations of homogeneous latent constructs (Cronbach, 1951). The raw data were not modified to improve alpha, and no respondents were removed for that purpose. Because the questionnaire indicators refer to distinct operational experiences-such as power interruption, network lag, hardware usability, timer concern, mock-session availability, and transit risk-the study treated item level responses as the primary empirical evidence. Mean composites were retained only as exploratory indices for selected correlations and group comparisons. The two-item anxiety indicator (timer panic and mouse/interface difficulty) was likewise treated as an exploratory summary rather than a validated psychometric anxiety scale. The 400 responses were analyzed using IBMSPSS Statistics Version 28 and independently rechecked from the raw dataset. Frequencies, percentages, means, and standard deviations were calculated for the descriptive research questions. Independent-samples t-tests were used to compare Federal and State institutions and urban- and rural-background students. One-way ANOVA examined variation across the four participating institutions. Pearson correlations were used for bivariate associations among exploratory indices, with Spearman rank correlations used as sensitivity checks because the substantive responses were four-point Likert-type data. Effect sizes and confidence intervals were considered where appropriate. Statistical significance was evaluated at $\alpha = .05$. Given the cross-sectional design, correlation results were interpreted as associations and not as evidence of causation.

IJOGSE 2026

Results

Table 1: Respondent Profile

Variable	Category	Frequency (n)	Percentage (%)
Institution	Federal A (Institution 1)	108	27.0
	Federal B (Institution 2)	85	21.3
	Federal A (Institution 3)	110	27.5
	Federal B (Institution 4)	97	24.3
Institutional ownership	Federal	193	48.25
	State-owned	207	51.75
Secondary-school background	Urban	256	64.0
	Rural	144	36.0
Total	All respondents	400	100.0

Perceived Prospects of CBT

All five prospect indicators exceeded the criterion mean of 2.50. The highest-rated prospect was faster processing and release of examination results (M= 3.70, SD = 0.458), followed by question randomization and examination integrity (M= 3.64, SD = 0.623), reduction of missing scripts (M= 3.60, SD = 0.489), reduced examiner bias (M= 3.59, SD = 0.492), and digital-skill enhancement (M= 3.40, SD = 0.683). The exploratory composite prospects index was M= 3.5865 (SD = 0.24955).

Table 2: Perceived Prospects of CBT

S/N	Indicator	Mean (M)	Standard deviation (SD)	Interpretation
1	Faster processing and release of results	3.70	0.458	High prospect
2	Question randomization and examination integrity	3.64	0.623	High prospect

IJOGSE 2026

3	Reduction missing scripts	3.60	0.489	High prospect
4	Reduced examiner bias	3.59	0.492	High prospect
5	Digital-skill enhancement	3.40	0.683	High prospect
	Exploratory prospects index	3.5865	0.24955	Strong agreement

Infrastructural and CBT-Related Challenges

All five indicators were above the 2.50 criterion mean. Unstable power supply recorded the highest Infrastructure-related challenge rating (M= 3.22, SD = 0.567), followed by hardware problems (M= 3.04, SD = 0.860), timer-related concern (M= 2.98, SD = 1.096), mouse/interface difficulty (M= 2.94, SD = 1.158), and network latency or server-related delays (M= 2.83, SD = 1.093). The exploratory infrastructure index was M= 3.0020 (SD = 0.46684).

Table 3: Infrastructural and CBT-Related Challenges

S/N	Indicator	Mean (M)	Standard deviation (SD)	Interpretation
1	Unstable power supply and generator failures	3.22	0.567	Major challenge
2	Faulty or outdated hardware	3.04	0.860	Major challenge
3	Timer-related panic or stress	2.98	1.096	Major concern
4	Mouse/interface navigation difficulty	2.94	1.158	Major concern
5	Network latency or server-related delays	2.83	1.093	Major challenge
	Exploratory infrastructure index	3.0020	0.46684	Substantial challenge

CBT-Related Anxiety and Usability Indicators

Timer panic recorded M= 2.98 (SD = 1.096), while mouse/interface struggle recorded M= 2.94 (SD = 1.158). Their exploratory two-item anxiety index had M= 2.9600 (SD = 0.82544). Because the two items were weakly correlated, these results are interpreted as distinct operational indicators rather than evidence of a validated anxiety scale.

IJOGSE 2026

Table 4: CBT-Related Anxiety and Usability Indicators

S/N	Indicator	Mean (M)	Standard deviation (SD)	Interpretation
1	Timer-related panic	2.98	1.096	Considerable concern
2	Mouse/interface navigation difficulty	2.94	1.158	Considerable concern
	Exploratory two-item anxiety index	2.9600	0.82544	Exploratory summary

Table 5: Associations among Key CBT Indicators

Variables	Pearson's r	p-value	Spearman's ρ	p-value
Infrastructure challenges and CBT-related anxiety	0.766	< .001	0.755	< .001
Infrastructure challenges and perceived CBT prospects	−0.121	.015	−0.106	.035
CBT-related anxiety and disruption/logistics	−0.007	.883	−0.022	.668

Infrastructure challenges were strongly and positively associated with CBT-related anxiety (Pearson r = .766, p < .001). The similar Spearman result (ρ = .755, p < .001) supports the robustness of the association. Infrastructure challenges also showed a small negative association with perceived CBT prospects (r = -.121, p = .015; ρ = -.106, p = .035). No meaningful association was found between the exploratory anxiety and disruption/logistics indices (r = -.007, p = .883; ρ = -.022, p = .668). These relationships should not be interpreted causally.

Logistical and Administrative Constraints

The strongest logistical constraint was the absence of mock CBT and orientation sessions (M= 3.33, SD = 1.036), followed by overcrowding/batching delays and fatigue (M= 2.98, SD = 1.194), and transit-related risks (M= 2.93, SD = 1.303). The exploratory logistics index was M= 3.0792 (SD = 0.71239).

IJOGSE 2026

Table 6: Logistical and Administrative Constraints

S/N	Indicator	Mean (M)	Standard deviation (SD)	Interpretation
1	Absence of mock CBT and orientation sessions	3.33	1.036	Major constraint
2	Overcrowding, batching delays and fatigue	2.98	1.194	Major constraint
3	Transit-related and security risks	2.93	1.303	Major constraint
	Exploratory logistics index	3.0792	0.71239	Substantial constraint

Federal-State Comparison

The exploratory infrastructure index was almost identical for Federal and State-owned institutions. Federal institutions recorded M= 3.0021 (SD = 0.4765; n = 193), whereas State-owned institutions recorded M= 3.0019 (SD = 0.4588; n = 207). The independent-samples t-test yielded t(398) = 0.003, p =.998, with Cohen's d ≈0.0003 and a 95% confidence interval for the mean difference of approximately [-0.0918, 0.0921]. Thus, the null hypothesis was not rejected. There was neither a statistically significant nor a practically meaningful difference in reported infrastructure challenges between the two ownership categories. An additional exploratory comparison showed somewhat higher logistics scores in State-owned institutions than in Federal institutions (approximately M= 3.151 vs. 3.002, p = .036; Cohen's d ≈0.211). Because this comparison was not part of the original hypothesis and the broader institutional evidence for logistics differences was mixed, it is treated as an exploratory finding rather than a definitive institutional effect.

Urban-Rural Comparison

Urban-background students had an anxiety index mean of 2.9727 (SD = 0.8444), compared with 2.9375 (SD = 0.7931) for rural-background students. The difference was not significant, t(398) = 0.408, p = .683, Cohen's d ≈0.043. For the disruption/logistics index, urban-background students had M= 3.0807 (SD = 0.7454), while rural-background students had M= 3.0764 (SD = 0.6522); the difference was negligible and non-significant, t(398) = 0.058, p = .953, Cohen's d ≈0.006. The second null hypothesis was therefore not rejected. These results do not support a simple locality-based explanation for CBT anxiety or disruption in the study sample. They should not, however, be interpreted as proof that secondary-school background is irrelevant in all contexts.

IJOGSE 2026

Table 7: Cross-Institutional ANOVA and Sensitivity Analysis

Outcome variable	**F(3, 396)**	**p-value**	**η^2 (approx.)**	**Decision**
CBT prospects	0.897	.443	0.007	Not significant
Infrastructure challenges	0.765	.514	0.006	Not significant
Logistics	2.450	.063	0.018	Not significant
CBT-related anxiety	0.660	.577	0.005	Not significant

The ANOVA did not identify statistically significant differences among the four institutions at $\alpha = .05$. Because the outcome measures are based on four-point Likert-type responses and some distributions were non-normal, Kruskal-Wallis tests were also used as sensitivity analyses. The corresponding p-values were .399 for prospects, .562 for infrastructure, .034 for logistics, and .338 for anxiety. The logistics result therefore warrants caution: the non-parametric test suggested overall variation, but adjusted pairwise comparisons did not identify a statistically significant institution pair. Accordingly, the evidence is best characterized as exploratory rather than definitive.

Discussion

The study demonstrates a clear contrast between strong student endorsement of the potential value of CBT and substantial concerns about the conditions under which CBT is implemented. The strongest prospect was faster processing and release of results, followed by examination integrity, reduced missing scripts, lower exposure to grading bias, and digital-skill development. This pattern is consistent with earlier Nigerian research emphasizing the administrative and integrity-related advantages of digital assessment (Ayo et al., 2007; Abubakar & Adebayo, 2014; Alabi et al., 2012). The result also aligns with TAM: students appear to recognize CBT's usefulness even when aspects of its execution remain problematic (Davis, 1989).

This finding is also consistent with recent evidence from Nigeria. Awoleru (2026) reported predominantly positive CBT experiences among students in Oyo State institutions, while Zakariya et al. (2026) found that Nigerian undergraduates valued the efficiency of CBT but continued to report technical and stress-related concerns. The convergence across different Nigerian settings strengthens the interpretation that CBT acceptance can be high even when implementation quality remains uneven.

IJOGSE 2026

The infrastructure findings point to the central practical weakness of CBT implementation. Power instability was the highest-rated technical challenge, followed by hardware problems and connectivity- related concerns. These results are consistent with Nigerian studies that identify electricity, ICT facilities, and network reliability as persistent determinants of e-assessment readiness (Jimoh et al., 2012; Onyibe et al., 2015). Importantly, the findings indicate that students' challenges are not confined to abstract concerns about infrastructure; they include concrete interactional problems such as timer-related stress and mouse/interface difficulty during the examination process.

The same pattern is visible in recent empirical work. Israel et al. (2024) documented power outages, faulty computers, and time-related difficulties among Nigerian nursing candidates, while Agbajeola et al. (2026) reported a significant relationship between infrastructure availability and undergraduate academic performance. These findings provide useful external support for the present study's emphasis on power reliability, hardware condition, and the examination environment.

The strong association between infrastructure difficulties and CBT-related anxiety ($r = .766$; $\rho = .755$) is one of the study's most important findings. It suggests that students who report more technical difficulty also tend to report greater anxiety-related difficulty. This pattern is consistent with the computer-anxiety and cognitive-attentional perspective, in which attention can be redirected toward task-irrelevant worries during stressful computer-mediated tasks (Wine, 1971; Heinssen et al., 1987).

Nevertheless, the result is correlational and cross-sectional. It does not establish that infrastructure problems cause anxiety, and it is equally inappropriate to assume that anxiety necessarily causes greater perception of infrastructure difficulty.

The finding also sits within a recent Nigerian literature linking CBT experiences with anxiety and technology readiness. Ezeugo and Nwankwo (2025) found that test anxiety was a significant predictor of satisfaction with computer-based examinations, whereas Zakariya et al. (2026) reported that technical failures and limited digital skills could undermine students' ease of use and increase examination-related stress. The present study extends this literature by showing a strong association specifically, between reported infrastructure difficulties and CBT-related anxiety within a North-Eastern Nigerian sample. The lack of a significant Federal-State difference in infrastructure challenges is also important. The means were virtually identical and the effect size

IJOGSE 2026

was effectively zero. This suggests that, within the four institutions studied, infrastructure problems may reflect wider systemic constraints rather than a simple ownership-tier effect. The finding cautions against assuming that Federal ownership automatically confers a materially better CBT environment than State ownership.

Similarly, the absence of significant urban-rural differences in the exploratory anxiety and disruption indices challenge a simple digital-divide interpretation based only on secondary-school locality.

Contemporary patterns of technology access may be more complex than historical assumptions about rural students' exposure to computers. The finding does not eliminate background differences as a possible influence in other samples, but it indicates that locality alone was not a meaningful discriminator of CBT-related anxiety or disruption in this study. The logistical results reinforce the importance of preparation and institutional organization. The highest- rated constraint was the lack of mock/orientation sessions. This finding has a direct practical implication: improving student preparation may be a relatively low-cost intervention compared with major infrastructure projects. Orientation can familiarize candidates with navigation, timing, question movement, and submission procedures before they encounter a high-stakes examination. At the same time, the prominence of power and hardware problems shows that orientation cannot substitute for reliable technical infrastructure.

Conclusion

The study concludes that students in the sampled North-Eastern Nigerian tertiary institutions generally perceive CBT as a valuable assessment model, particularly because of its speed, perceived integrity, record safety, and objectivity. However, high acceptance of CBT coexists with substantial operational challenges. Power instability, hardware limitations, network problems, timer-related concerns, interface difficulties, inadequate mock practice, overcrowding, and transit-related constraints remain important aspects of students' reported examination experience.

The strongest inferential result was the strong positive association between infrastructure difficulties and CBT-related anxiety. In contrast, institutional ownership did not differentiate infrastructure challenges, and secondary-school locality did not differentiate anxiety or disruption. These findings support a system-level view of CBT implementation in which infrastructure resilience, user preparation, and administrative organization must be addressed together.

IJOGSE 2026

Recommendations

1. Institutions should provide mandatory, low-stakes mock CBT and orientation sessions before major examinations. Orientation should include interface navigation, timing procedures, question movement, and submission processes.
2. CBT centres should develop resilient and preferably distributed backup power arrangements, including UPS systems, solar-inverter solutions and appropriately maintained generators.
3. ICT units should conduct pre-examination hardware audits and replace or repair faulty mice, keyboards, monitors and other peripherals before examination cycles begin.
4. Institutions should strengthen local-area network and server contingency arrangements and reduce avoidable dependence on unstable external connectivity during examinations. Examination schedules should be phased and coordinated to reduce overcrowding, long waiting periods, fatigue and avoidable transit risks.

References

Abubakar, A. S., & Adebayo, F. O. (2014). Using computer-based test method for the conduct of examination in Nigeria: Prospects, challenges and strategies. *Mediterranean Journal of Social Sciences, 5(*2), 47–55.https://doi.org/10.5901/mjss.2014.v5n2p47

Alabi, A. T., Issa, A. O., & Oyekunle, R. A. (2012). The use of computer-based testing method for the conduct of examinations at the University of Ilorin. *International Journal of Learning and Development*, *2(*3), 68–80. https://doi.org/10.5296/ijld.v2i3.1775

Ayo, C. K., Akinyemi, I. O., Adebiyi, A. A., & Ekong, U. O. (2007). The prospects of e-examination implementation in Nigeria. *Turkish Online Journal of Distance Education, 8(*4), 125–134.

Creswell, J. W., & Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE Publications.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. Psychometrika, 16(3), 297–334.https://doi.org/10.1007/BF02310555

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319–340. https://doi.org/10.2307/249008

Heinssen, R. K., Glass, C. R., & Knight, L. A. (1987). Assessing computer anxiety: Development and validation of the Computer Anxiety Rating Scale. Computers in Human Behavior, 3(1), 49–59. https://doi.org/10.1016/0747-5632 (87)90010-0

IBMCorp. (2021). IBMSPSS Statistics for Windows (Version 28.0) [Computer software]. IBMCorp.

Jimoh, R. G., Shittu, A. J. K., & Kawu, Y. K. (2012). Students' perception of computer-based test (CBT) for examining undergraduate chemistry courses. Journal of Emerging Trends in Computing and Information Sciences, 3(2), 125–134.

IJOGSE 2026

Onyibe, C. O., Nwachi-Ikpor, J. O., & Abdulhakim, A. A. (2015). Computer based testing technique in Nigeria: Prospects and challenges. Journal of Information Engineering and Applications, 5(10), 17–21.

Osuji, U. S. A. (2012). The use of e-assessments in the Nigerian higher education system. Turkish Online Journal of Distance Education, 13(4), 140–152.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly, 27(3), 425–478. https://doi.org/10.2307/30036540

Wine, J. (1971). Test anxiety and direction of attention. Psychological Bulletin, 76(2), 92–104. https:// doi.org/10.1037/h003133

IJOGSE 2026