

Electronic-Governance and Management of Educational Examination by Joint Admission Matriculation Board, 2014-2025

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Abstract

The management of educational examinations in Nigeria faces persistent challenges of examination malpractices, administrative inefficiency and the erosion of public confidence in examination outcomes. This study examined the impact of e-governance on the management of educational examinations by the Joint Admissions and Matriculation Board (JAMB) from 2014 to 2025. The study was anchored on the Technology Acceptance Model which argued that the success of any technological innovation depends not only on the availability of the technology but also on users' perception, acceptance and actual utilisation of the system. The survey research design was adopted, while a 4-point modified Likert Scale Structured questionnaire was used to collect data from all 50 staff of the JAMB zonal office in Port Harcourt. Data were analysed using mean and standard deviation while the chi-square statistics was employed to test the hypotheses at $df = 3$ and $\alpha = 0.05$. The findings of the study revealed that JAMB deploys a functionally diverse portfolio of e-government tools, including the CBT platform, online registration system, biometric verification, CAPS and USSD/mobile notification services, all of which were affirmed by respondents with cluster means ranging from 3.14 to 3.25, exceeding the criterion mean of 2.50. The null hypotheses were rejected on the basis of chi-square values that substantially exceeded the critical value of 7.815, confirming relationships between e-governance tools and examination management outcomes. The study concludes that despite these gains, significant challenges including inadequate internet connectivity, high infrastructure costs, digital literacy deficits, system downtime and cybersecurity threats constituted hindrances to the effectiveness of the e-governance tools. The study recommended that the JAMB management team should sustain investment in broadband infrastructure and mandatory digital literacy programmes for candidates. Also, the JAMB management should see to the establishment of a dedicated cybersecurity governance unit and a formal inter-agency e-governance coordination framework to strengthen the equity, reliability and integrity of JAMB's examination management system.

Keywords: E-Governance, Management, Education, Examination, Board.

Introduction

The twenty first century has witnessed unprecedented advancements in information and communication technology, altering how governments discharge their responsibilities and interact with citizens. Public institutions in developed and developing countries alike are replacing manual administrative processes with digital systems that promote efficiency, transparency, accountability and accessibility. This has produced e-governance, understood

as the application of digital technologies by government institutions to improve decision making, service delivery, information management and communication with citizens. According to Alzoubi and Mishra (2025), countries that have implemented e-governance successfully have recorded significant improvements in institutional performance, administrative efficiency and citizen satisfaction. The growing acceptance of e-governance reflects rising public demand for effective service delivery in an era of rapid technological innovation. Governments have consequently introduced platforms that simplify administration, reduce bureaucratic bottlenecks and narrow opportunities for corruption, while enabling citizens to monitor government activities without undue delay. Afieroho, Perkins, Zhou, Hoanca and Protasel (2023), observed that the adoption of e-governance has enhanced public confidence in government institutions by improving transparency and strengthening accountability mechanisms. E-governance is now central to public sector reform because it supports efficient resource management, improves institutional coordination and enhances communication among agencies. Unlike conventional systems dependent on paperwork and manual record keeping, it enables institutions to automate routine operations, maintain electronic databases and deliver services through integrated platforms, raising productivity and reducing costs. Olumoye and Govender (2018), argued that integrated e-governance systems improve institutional effectiveness by facilitating better coordination, information sharing and administrative control across public organisations. Governments have nevertheless come to recognise that successful digital governance depends not only on technological infrastructure but also on supportive policies, skilled personnel and public acceptance. Muhammad and Kaya (2023), explained that citizens are more likely to adopt e-governance services when they perceive them to be reliable, secure, user friendly and beneficial to their dealings with government. The relevance of e-governance extends into virtually every sector of national development, including healthcare, agriculture, transportation, taxation and education. Within education it has reshaped administrative planning, student registration, record management, examination administration and stakeholder communication, allowing authorities to manage large volumes of student information accurately while reducing the delays of manual procedure. Ishola, Maramura and Gumbo (2025), maintained that information and communication technology has become one of the most important drivers of administrative innovation within contemporary public institutions, and Adjei, Kagbetor, Damengua and Zaglago (2025), noted that digital technologies are now indispensable tools for improving educational administration and institutional effectiveness. The management of educational examinations is among the areas most transformed by e- governance. Examinations assess students for academic progression, certification and admission into higher institutions, and because their outcomes determine educational and career opportunities, they demand integrity, efficiency, confidentiality and transparency. Examination bodies in many countries now employ electronic systems for registration, scheduling, biometric verification, result processing and dissemination of outcomes. Madland, Irvine, DeLuca and Bulut (2024), explained that technology integrated assessment has strengthened the quality, reliability and effectiveness of educational evaluation across different systems. The move from paper-based examinations to computer-based testing is the most significant of these developments. Computer based examinations permit faster processing of data, immediate scoring of objective questions, improved security of materials and better management of large candidate populations, while reducing the cost and logistics of printing, transporting and securing paper materials. Abubakar and Adebayo (2014), argued that computer-based testing offers considerable opportunities for improving examination credibility, reducing malpractice and enhancing the overall quality of educational assessment in Nigeria.

The rapid expansion of digital examination systems has also generated challenges requiring sustained institutional attention. Technical failure, unstable connectivity, inadequate electricity, cyber security threats, weak infrastructure and unequal access to technology continue to constrain electronic examination management across many developing countries, showing that implementation requires sustained investment in infrastructure and human capacity. Dupe Ayesha, Ahlan, Muhamad Ibrahim and Ahmed (2025,) observed that although e governance has improved public service delivery in Nigeria, difficulties relating to infrastructure, policy implementation and institutional capacity continue to affect its overall performance. The COVID 19 pandemic accelerated the adoption of digital technologies in education worldwide. Institutions adopted online learning platforms, virtual classrooms and electronic assessment to sustain academic activity despite restrictions on physical interaction, and the period established digital governance as an essential element of educational resilience. Maboe and Tomas (2023), concluded that digital assessment systems have become increasingly important because they enable institutions to maintain academic continuity during disruption while improving flexibility in examination administration. Nigeria has participated actively in this global movement. Successive governments have acknowledged that information and communication technology can improve administrative efficiency, strengthen transparency and raise service quality, and several ministries, departments and agencies have adopted electronic platforms accordingly. The Federal Ministry of Communications, Innovation and Digital Economy (2023), stated that the national e government initiative seeks to accelerate digital transformation across public institutions and improve governance through technology driven service delivery. Implementation has nevertheless varied, with poor infrastructure, inadequate funding, weak technical capacity, limited internet penetration and resistance to change slowing progress in several agencies. Zoleh (2026), argued that digital governance remains an essential strategy for improving public sector efficiency in Nigeria notwithstanding these persistent institutional and infrastructural constraints. Among the institutions demonstrating notable progress in applying e governance is the Joint Admissions and Matriculation Board. Established in 1978, JAMB conducts the Unified Tertiary Matriculation Examination and coordinates admissions into universities, polytechnics, colleges of education and other approved tertiary institutions. Because millions of candidates seek admission annually, the Board discharges one of the largest examination management responsibilities in Africa, and that scale made modernisation unavoidable. Chukwuemeka, Chinenye and Okafor (2018), maintained that the adoption of e-governance has transformed JAMB into one of the leading examples of digital public service delivery within Nigeria's education sector. Before these reforms, the Unified Tertiary Matriculation Examination depended on manual procedures. Registration was largely paper based, materials were physically distributed to centres and results took considerable time to process, creating openings for impersonation, malpractice, multiple registration, document forgery and administrative inefficiency, and a growing candidate population exposed the limits of the arrangement. Abubakar and Adebayo (2014), observed that manual examination administration carried numerous operational weaknesses that reduced the credibility and effectiveness of large-scale public examinations. The turning point came in 2014, when JAMB introduced the Computer Based Test for the Unified Tertiary Matriculation Examination. The reform sought to improve security, reduce malpractice, accelerate result processing and raise administrative efficiency, enabling the Board to absorb a growing candidate population without a proportionate rise in operational complexity. Ojo, Akpalaba and Olugbade (2023), noted that computer-based testing has improved the conduct of university entrance examinations by promoting efficiency and faster service delivery, while Alarape (2024), found that it has contributed significantly to reducing examination malpractice and strengthening quality assurance within the higher education

admission process. Computer based testing was accompanied by biometric verification, electronic registration, online scheduling, digital monitoring of centres and automated result processing. JAMB further introduced the Central Admissions Processing System, through which admission decisions are processed, monitored and coordinated between the Board and tertiary institutions, and through which candidates may track their status and accept or decline offers electronically. According to the Joint Admissions and Matriculation Board (n.d.), the system was introduced to ensure fairness, transparency and accountability in admissions while giving candidates greater access to information concerning their status. A further component of these reforms is the integration of the National Identification Number into candidate registration, introduced to strengthen identity verification, eliminate multiple registrations and improve the credibility of candidate records. This linkage illustrates the growing interconnectedness of digital governance across government institutions. Ndema (2025) argued that the integration of digital identity management into JAMB's admission policies has improved administrative coordination and strengthened the integrity of examination management, and Abdulkareem, Oladimeji, Ishola, Adejumo and Abdulkareem (2024), explained that digital identity systems strengthen trust, improve administrative efficiency and facilitate effective interaction between government institutions and citizens. These reforms have also improved data management and institutional decision making. Electronic databases allow the Board to store, retrieve and analyse candidate information more accurately than manual systems, supporting evidence-based planning and policy formulation while reducing opportunities for record manipulation. Eweoya, Okuboyejo, Odetunmbi and Odusote (2021), observed that successful adoption of digital systems depends largely on user acceptance and on institutional capacity to maintain reliable electronic information management, and Owo and Green (2025), argued that effective computer based examination systems improve the accuracy of student assessment and strengthen confidence in admission decisions. Substantial operational challenges nevertheless remain. System failure, unstable connectivity, electricity interruption, cyber security concerns, weak infrastructure and unequal access to digital facilities continue to affect examination administration in parts of Nigeria, disrupting schedules and weakening public confidence. Mpofu and Machingauta (2024), argued that effective online examination systems require continuous investment in technological infrastructure, technical support, personnel training and institutional preparedness, while Coniam, Lampropoulou and Cheilari (2021), emphasised that the credibility of technology driven examinations depends largely on the reliability, security and stability of the digital systems supporting them. The most significant test of Nigeria's digital examination management came in the 2025 Unified Tertiary Matriculation Examination, when technical errors affected the processing of results for a large number of candidates and provoked widespread criticism. The Board acknowledged the fault and organised a resit for those affected. Premium Times (2025), reported that the error affected hundreds of thousands of candidates and prompted a nationwide resit intended to preserve the credibility of the examination, and The Cable (2025), observed that the decision to admit the error and organise the resit reflected a meaningful commitment to transparency and accountability in public administration. The episode prompted debate on the reliability of e-governance in examination management, with stakeholders questioning the adequacy of existing infrastructure, quality assurance and emergency response procedures. It underlined that e-governance is not merely the introduction of computers into public administration but the sustained planning, implementation, monitoring and improvement of digital systems. Dupe Ayesha, Ahlan, Muhamad Ibrahim and Ahmed (2025), maintained that the sustainability of e-governance depends on continuous policy support, institutional commitment, technological upgrading and effective management of implementation challenges.

A related concern is the digital divide. Although computer-based examinations are now the national standard, differences in computer literacy, internet exposure and access to technology continue to shape candidates' experiences, with urban students generally better placed than rural counterparts to acquire the necessary skills, and sensitisation programmes and mock examinations have narrowed but not closed the gap. Abdulkareem and Lennon (2023), found that the digital divide continues to influence students' performance in Nigeria's computer based Unified Tertiary Matriculation Examination, particularly among candidates with limited exposure to digital technologies. The evolution of e-governance further obliges examination bodies to strengthen cyber security and preserve the confidentiality of examination data, since dependence on electronic databases increases exposure to cyber threats, unauthorised access and data manipulation where safeguards are weak. Oludu, Kaya and Karagozlu (2025), explained that citizens' confidence in digital governance is strengthened when electronic systems demonstrate transparency, security and reliability. Since 2014, therefore, JAMB has extended e-governance through online registration, biometric verification, computer-based testing, electronic result management, the Central Admissions Processing System, the National Identification Number and digital communication platforms, reducing manual procedure and strengthening transparency and accountability within the tertiary admission system. Recent difficulties nonetheless show that digital transformation is a continuous process demanding constant evaluation. Malik and Ojekudo (2026), argued that sustainable educational management depends on continuous investment in digital technologies capable of supporting inclusive, efficient and responsive educational administration. Although existing studies have examined e-governance, computer based testing, digital public administration and educational technology, most have concentrated on technology adoption, user acceptance, examination malpractice or academic performance, and few have evaluated comprehensively how e -governance has shaped the management of educational examinations within the Joint Admissions and Matriculation Board over an extended period. Recent developments in admission processing, biometric verification, digital identity integration and the failures exposed by the 2025 technical error indicate that further investigation is warranted. This study therefore examines e -governance and the management of educational examinations, using the Joint Admissions and Matriculation Board as a case study from 2014 to 2025.

The objectives of the study are to:

- i. Examine the e-governance tools utilised by the Joint Admissions and Matriculation Board in the management of educational examination, and
- ii. Assess the impact of online registration systems on administrative effectiveness in the management of educational examinations by the Joint Admissions and Matriculation Board.

Flowing from these, the study raised the following questions;

- i. What are the e-governance tools utilised by the Joint Admissions and Matriculation Board in the management of educational examinations, and
- iii. What are the impacts of online registration systems on administrative effectiveness in the management of educational examinations by the Joint Admissions and Matriculation Board.

The study tested the following null hypotheses at 0.05 level of significance:

- H₀₁: E-governance tools have no significant influence on the management of educational examinations by the Joint Admissions and Matriculation Board.
- H₀₂: Online registration systems have no significant influence on administrative effectiveness in the management of educational examinations by the Joint Admissions and

Matriculation Board.

The study is segmented into five interrelated parts; part one is the introduction which was just concluded, part two is a brief review of relevant literature to the study, part three is a synopsis of the method adopted by the study to collect and analyse data as well as test hypotheses, part four is the presentation of data, analysis and discussion of findings while part five, the final part is the summary, conclusion and recommendation of the study.

Theoretical Review

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is one of the most influential theories used to explain how individuals and organisations accept, adopt and utilise technological systems. The theory was developed by Fred Davis in 1989 as an extension of the Theory of Reasoned Action (TRA) developed by Fishbein and Ajzen in 1975. The Theory of Reasoned Action was originally developed to explain human behaviour by arguing that individuals' actions are influenced by their intentions, which are shaped by their attitudes and social factors. However, Davis observed that the increasing use of computer-based systems within organisations required a more specific framework that could explain why users accept or reject new technologies. Consequently, Davis (1989) developed the Technology Acceptance Model to explain the factors that influence users' willingness to accept and use information technology systems. The central argument of TAM is that the success of any technological innovation depends not only on the availability of the technology but also on users' perception, acceptance and actual utilisation of the system. According to Davis (1989), individuals are more likely to accept a technological system when they believe that the system is useful and easy to use. Therefore, the theory identifies two major factors that determine technology acceptance: perceived usefulness and perceived ease of use. These factors influence users' attitudes towards technology, their intention to use the technology and their actual usage behaviour. The development of TAM became important due to the rapid introduction of computer-based systems into organisational activities during the late twentieth century. Organisations were investing heavily in information technology, but many technological systems failed to achieve their expected outcomes because users were unwilling or unable to adopt them effectively. Davis (1989) therefore argued that understanding users' perceptions was necessary for successful technological implementation. The theory has since been applied in different areas, including electronic government services, online learning platforms, digital payment systems, computer-based assessment and public sector information systems. In recent years, TAM has become relevant in the study of e governance because government institutions across the world increasingly depend on digital technologies to improve service delivery. E governance involves the use of information and communication technology to provide public services, improve transparency and strengthen interaction between government institutions and citizens. However, the success of e governance initiatives depends largely on whether users accept and effectively utilise the digital platforms introduced by government agencies. Studies on government adoption have shown that technological availability alone does not guarantee successful implementation because factors such as users' confidence, digital skills, perceived usefulness and ease of access influence adoption behaviour (Muhammad & Kaya, 2023). The relevance of TAM to developing countries such as Nigeria is particularly important because many public institutions have introduced digital reforms aimed at improving administrative efficiency. However, challenges such as inadequate infrastructure, limited digital literacy, poor internet connectivity and institutional weaknesses continue to affect the effectiveness of these reforms. According to Dupe Ayesha *et al.* (2025), e government implementation in Nigeria has recorded significant progress, but challenges relating to infrastructure, policy

implementation and users' capacity continue to affect its sustainability. Similarly, Olumoye and Govender (2018) observed that successful e government implementation requires not only technological investment but also organisational readiness and user acceptance.

The first major assumption of the Technology Acceptance Model is perceived usefulness. Perceived usefulness refers to the extent to which individuals believe that the adoption of a technological system will improve their performance or produce better outcomes. Davis (1989) argued that users will be more willing to accept technology when they are convinced that it will make their tasks easier, faster and more effective. Therefore, technology adoption is influenced by the practical benefits users associate with the system.

In relation to this study, perceived usefulness explains the reasons behind JAMB's adoption of e governance in the management of educational examinations. The introduction of online registration systems, Computer Based Testing and electronic data management systems was based on the expectation that these technologies would improve examination administration. Through digital platforms, JAMB aims to reduce manual procedures, improve accuracy of candidate records, minimise examination malpractice and increase the speed of examination processing. Chukwuemeka et al. (2018) noted that the adoption of e governance within JAMB was aimed at improving service delivery, enhancing transparency and reducing administrative challenges associated with traditional examination management.

The usefulness of digital examination systems is also reflected in the adoption of Computer Based Testing by JAMB. Computer Based Testing has transformed examination administration by reducing dependence on paper-based processes and improving the efficiency of examination conduct. Abubakar and Adebayo (2014) explained that computer-based examination provides opportunities for improved examination management through faster processing, improved security and better monitoring mechanisms. Similarly, Ojo et al. (2023) noted that effective use of internet technologies can enhance the conduct of computer-based examinations by improving accessibility and administrative coordination.

The second major assumption of TAM is perceived ease of use. According to Davis (1989), users are more likely to adopt a technological system when they believe that operating the system requires little effort. A system may provide significant benefits, but if users perceive it as complicated or difficult to operate, acceptance may be reduced. Therefore, ease of use is an important factor influencing technology adoption. In the context of JAMB's e governance system, perceived ease of use relates to the ability of candidates, examination officials and educational institutions to effectively interact with digital examination platforms. Online registration systems, biometric verification procedures and Computer Based Testing platforms must be designed in a manner that allows users with different levels of technological experience to operate them successfully. Where candidates experience difficulties during registration or examination processes, the effectiveness of e governance may be affected. The issue of ease of use is particularly important considering the existence of digital inequality among Nigerian students. Although digital examination systems provide numerous benefits, not all candidates possess equal access to computers, internet facilities and digital knowledge. Abdulkareem and Lennon (2023) found that the digital divide affects students' experiences with computerised UTME in Nigeria, as differences in technological access and digital skills may influence examination outcomes. This supports the TAM assumption that users' ability to understand and operate technological systems influences their acceptance and effective utilisation. Another important assumption of TAM is attitude towards technology. Davis (1989) argued that individuals develop positive or negative attitudes towards technology based on their perception of its usefulness and ease of use. Positive attitudes encourage technology adoption, while negative attitudes may result in resistance or limited utilisation. Therefore, users' experiences and expectations play an important role in determining whether technological reforms achieve their intended

objectives. Applied to this study, the success of JAMB's e-governance initiatives depends partly on the attitudes of candidates, examination officials and other stakeholders towards digital examination systems. When candidates perceive Computer Based Testing as fair, reliable and capable of reducing malpractice, they are more likely to support and accept the system. However, where users experience technical difficulties, inadequate guidance or uncertainty about digital procedures, negative attitudes may develop.

The theory also assumes that behavioural intention influences actual technology usage. Davis (1989) explains that individuals who develop positive intentions towards a technological system are more likely to use it consistently. Behavioural intention is therefore considered an important link between users' perceptions and their actual interaction with technology.

Conceptual Review

E-Governance

E governance refers to the use of information and communication technology by government to improve decision making, service delivery, information management and communication with citizens. The concept has been defined in different ways by different scholars, and the definitions differ mainly in how far they extend beyond the delivery of services. Alzoubi and Mishra (2025) defined e governance as a systemic reorientation of public administration in which digital platforms become the main channel of interaction between institutions and citizens. Their study of ten African states found that countries which pursued this reorientation recorded better institutional performance and higher citizen satisfaction. Afieroho, Perkins, Zhou, Hoanca and Protasel (2023) defined the concept more broadly. In their view, e governance covers not only service transactions but also the ability of citizens to observe and evaluate what government does. Olumoye and Govender (2018) approached the concept from an implementation standpoint. They defined it as the integration of digital systems across public organisations for the purpose of improving coordination, information sharing and administrative control. These definitions share a common element. Each treats e governance as more than the computerisation of existing office routine. Each treats it as a change in how public institutions organise their work and relate to the people they serve. For the purpose of this study, e governance is defined as the application of information and communication technology by a public institution to the processes of registration, service delivery, record management, decision making and communication, in a manner that improves administrative effectiveness, transparency and accountability.

Scholars often distinguish between electronic government and electronic governance. Electronic government refers mainly to the use of technology in delivering services and running internal operations. Electronic governance refers to the wider change in the governing relationship. It includes transparency, accountability, participation and the exercise of public authority through digital means. The distinction is useful but not absolute. Afieroho and colleagues (2023) illustrated the wider meaning in their study of infrastructure project monitoring in Nigeria. In that case digital platforms were used not merely to process transactions but to allow citizens to observe the conduct of government itself.

The literature classifies e governance according to the relationships it serves. The government to citizen relationship covers services delivered directly to individuals. These include registration, licensing, payment and information provision. The government to business relationship covers procurement, taxation and regulatory compliance. The government to government relationship covers the exchange of information between agencies and between tiers of government. The government to employee relationship covers internal personnel and payroll administration. Olumoye and Govender (2018) found that the government to government relationship is often the hardest to achieve. Integration across institutional boundaries requires compatible technical systems, shared data standards, aligned incentives

and a willingness by agencies to give up some independence. E governance is generally understood to develop in stages rather than all at once. Institutions usually begin by publishing information on a website. They then move to interactive services which allow forms to be downloaded and submitted. They then move to transactional services which allow a complete administrative process to be finished online. The final stage is integrated service, where several agencies present a single interface to the user. Ishola, Maramura and Gumbo (2025) mapped the Nigerian research literature on this subject. They found that attention has concentrated on the earlier stages, with little examination of the integrated stage at which real transformation occurs. The benefits claimed for e governance are well documented. Digital systems reduce the cost citizens bear because physical attendance is no longer required. They shorten processing time by automating routine decisions. They reduce the space within which corruption operates by creating records that can be audited. They improve institutional decision making by generating reliable data on service demand and performance. They also improve fairness of access in principle, because services become available regardless of how far a citizen lives from an office. Oludu, Kaya and Karagozlu (2025) found that citizen confidence in digital governance rises where electronic systems visibly show transparency, security and reliability, and falls where these qualities are absent.

Adoption is not automatic, and a large body of work examines what determines it. Muhammad and Kaya (2023) found in Nigeria that citizens adopt electronic government services when they see them as reliable, secure, easy to use and beneficial. They also found that perceived risk discourages adoption. Munyoka and Maharaj (2017) found across two Southern African states that the link between belief and adoption is affected by user experience and by whether use is voluntary. Abdulkareem, Oladimeji, Ishola, Adejumo and Abdulkareem (2024) found that institutional trust is a decisive factor in electronic identity adoption in Nigeria. Citizens will not surrender identity data to a system they do not believe will protect it. Eweoya, Okuboyejo, Odetunmibi and Odusote (2021) reached a similar conclusion. They found that the technical quality of a platform is not enough on its own, because acceptance is governed by how users perceive it.

Educational Management

Educational management refers to the coordination of human, financial, material and information resources within educational institutions and systems for the purpose of achieving stated educational goals. It applies general management principles to education. The setting differs from business in three ways. The purposes pursued are educational rather than commercial. The main beneficiaries are learners. The outcomes sought are often long term and difficult to measure. Scholars have defined the concept in slightly different terms. Chen (2023) described educational management as a field undergoing conceptual reconstruction under the influence of digital and intelligent technologies. That study argued that established models of institutional coordination need revision as decision making becomes increasingly based on data. Adjei, Kagbetor, Damengua and Zaglago (2025) approached the concept practically. They treated educational management as the set of administrative activities through which a school organises records, communication and reporting, and they treated digital technology as an instrument of those activities. Malik and Ojekudo (2026) approached it from the standpoint of inclusion. They treated educational management as effective only where it extends institutional participation to stakeholders previously left out. For the purpose of this study, educational management is defined as the planning, organisation, direction, coordination and control of resources and processes within an educational institution or system in order to achieve defined educational objectives. Examination management is treated as a specialised branch of this wider activity.

The classical account of educational management proceeds through the functions of management. Planning involves setting educational objectives and choosing the means of achieving them. It includes enrolment projection, curriculum design and resource forecasting. Organising involves establishing institutional structure, dividing responsibility and creating reporting relationships. Staffing involves recruiting, deploying, developing and retaining teaching and administrative personnel. Directing involves leadership and the motivation of staff. Coordinating involves aligning separate activities so that they serve a common purpose. Controlling involves setting standards, measuring performance against them and correcting deviation. Reporting and budgeting complete the sequence by accounting for institutional activity and allocating money to it. Assessment and examination management belong mainly to the controlling function, because they are the means by which educational systems measure attainment against standard. The scope of educational management is usually discussed at three levels. At the system level it concerns national and state policy, the structure of the education sector, the allocation of public funds to education and the regulation of institutions. At the institutional level it concerns the internal administration of a school, college or university. This includes academic programming, student affairs, personnel and finance. At the classroom level it concerns instructional organisation and the management of learning. Examination bodies occupy a special position in this arrangement. They operate at the system level but perform an operational function that touches individual candidates directly. The literature distinguishes between educational management, educational administration and educational leadership, although usage varies. Educational administration usually refers to carrying out established policy and maintaining institutional routine. Educational management refers more broadly to coordinating resources towards objectives, and includes both routine execution and managerial judgement. Educational leadership refers to setting direction, influencing institutional culture and driving change. These distinctions are convenient rather than absolute. In practice the same officer usually performs duties under all three headings.

Joint Admissions and Matriculation Board

The Joint Admissions and Matriculation Board is the federal agency responsible for conducting matriculation examinations and coordinating admissions into tertiary institutions in Nigeria. It was established in 1978. Before its creation, each university conducted its own entrance examination and ran its own admission process. That arrangement placed a heavy burden on candidates, who had to sit several examinations at several locations. It also produced a confused national picture in which one candidate might hold several offers while others held none. A single national examination and a central admission coordination mechanism were introduced to correct these problems. The statutory functions of the Board are to conduct matriculation examinations for admission into universities, polytechnics, colleges of education and other approved tertiary institutions, to place qualified candidates in those institutions in line with approved guidelines, to determine matriculation requirements in consultation with institutions, and to collect and publish information on admission. The scale of this work is considerable. The Board processes registration for millions of candidates each year. It administers the Unified Tertiary Matriculation Examination at hundreds of centres across the country within a short period. This makes it one of the largest examination management operations in Africa. Before the digital reforms examined in this study, the Board worked largely by manual means. Registration was paper based. Examination materials were printed centrally and physically distributed to centres. Result processing took a long time before release. Abubakar and Adebayo (2014) documented the weaknesses of this arrangement. They observed that manual examination administration carried many vulnerabilities which reduced the credibility and effectiveness of large scale public

examinations. These included exposure to impersonation, leakage of examination materials, multiple registration and delay in releasing results.

The decisive change came with the adoption of computer based testing. The Board introduced the format alongside paper testing before moving to full adoption. This sequence allowed examination centres to be accredited progressively and allowed operational experience to be gained. Abdulkadir, Onibere and Odion (2019) compared the academic performance of students admitted under each testing regime at Kaduna State University. Their study provided evidence on what the transition meant for candidate selection. Ojo, Akpalaba and Olugbade (2023) found that computer-based testing has improved the conduct of university entrance examinations by promoting efficiency and faster service delivery. They also identified internet capacity as a continuing constraint. Owo and Green (2025) compared scores obtained in the Board's examination with those obtained in institutional screening examinations for science education students. Their study addressed whether the two instruments measure candidate readiness consistently. Computer based testing was accompanied by a set of supporting digital systems which together make up the Board's e governance architecture. Online registration replaced paper application. Biometric capture and verification were introduced to establish candidate identity at registration and to confirm it at the examination venue. This addressed directly the vulnerability to impersonation identified in the earlier literature. Electronic result processing replaced manual collation. Digital monitoring of examination centres was introduced so that the conduct of the examination could be supervised remotely. Chukwuemeka, Chinenye and Okafor (2018) studied the Board directly. They held that the adoption of e governance had made the institution one of the leading examples of digital public service delivery in the Nigerian education sector.

Method

The study adopted a survey research design to examine the impact of e-governance on the management of educational examinations in the Joint Admissions and Matriculation Board (JAMB) from 2014 to 2025. The study was conducted at the JAMB Zonal Office, Port Harcourt, Rivers State, which implemented online registration, Computer Based Testing (CBT), electronic data management and biometric verification systems. The population comprised 50 staff of the office, and the entire population was used as the sample through census or total population sampling. Quantitative data were obtained from primary sources using a structured questionnaire titled the E-Governance and Educational Examination Management Questionnaire. The instrument consisted of demographic items and statements covering online registration, CBT, examination credibility, administrative effectiveness and challenges of e-governance implementation. Responses were measured using a four-point Likert scale questionnaire for data collection. Face and content validity were established through assessment by the supervisor and three experts, while reliability was examined through a pilot study involving 20 staff from a comparable JAMB office in the South-South region of the country using Cronbach's alpha. Data were presented in tables and analysed using mean and standard deviation, while the hypotheses were tested using the chi-square statistic at the 0.05 level of significance. This method therefore provided a structured basis for collecting and analysing empirical evidence relevant to the study objectives.

Data Analysis

E-Government Tools Utilised by JAMB in the Management of Educational Examinations

Table 1: Mean and Standard Deviation Scores for E-Government Tools Utilised by JAMB (Objective 1)

Statement	SA	A	D	SD	Mean ($\bar{x}$)	SD	Remark
JAMB utilises a functional e-registration portal that allows candidates to complete their registration process online without visiting a physical office.	24	17	6	3	3.24	0.83	Accepted
The JAMB Unified Tertiary Matriculation Examination (UTME) is administered through a Computer Based Testing (CBT) platform that replaces traditional paper-and-pencil methods.	27	16	5	2	3.36	0.77	Accepted
JAMB deploys a biometric verification system (fingerprint and facial recognition) to authenticate candidate identities during examination registration and sitting.	22	18	7	3	3.18	0.83	Accepted
JAMB makes effective use of the Central Admission Processing System (CAPS) to manage and coordinate tertiary institution admission processes electronically.	20	19	8	3	3.12	0.84	Accepted
JAMB employs a dedicated SMS/USSD short-code platform (e.g., 55019) and a mobile application to provide candidates with result slips, admission status updates, and other examination-related notifications.	19	20	8	3	3.10	0.83	Accepted
Cluster Mean					3.20	0.82	Accepted

Source; Field Survey, 2026

Table 1 presents the responses of the 50 respondents on the e-government tools utilised by JAMB in the management of educational examinations. Item 1, which states that JAMB utilises a functional e-registration portal that allows candidates to complete their registration process online without visiting a physical office, recorded a mean score of 3.25 (SD = 0.82), indicating that the majority of respondents agreed with this assertion. Item 2, relating to the administration of the UTME through the CBT platform as a replacement for the paper-and-pencil method, obtained the highest individual item mean of 3.35 (SD = 0.78), affirming the strong recognition of the CBT platform as a core e-government tool. Item 3, which concerns the deployment of biometric verification systems, yielded a mean of 3.22 (SD = 0.81), while Item 4, relating to JAMB's use of the Central Admission Processing System (CAPS),

recorded a mean of 3.13 (SD = 0.84). Item 5, which addresses the use of the SMS/USSD short-code platform and mobile application, returned a mean of 3.12 (SD = 0.83). The cluster mean for Objective 1 is 3.21 (SD = 0.82), which exceeds the criterion mean of 2.50. This result indicates that the respondents, in aggregate, agreed that JAMB utilises a range of effective e-government tools in the management of educational examinations.

Hypothesis Testing

H₀₁: There is no relationship between the e-government tools utilised by JAMB and the management of educational examinations.

Table 2: Chi-Square Test for the Relationship between E-Government Tools and the Management of Educational Examinations

Response Category	Observed (O)	Expected (E)	(O-E)	(O-E) ² /E	Decision
Strongly Agree (SA)	118	64.0	54.0	45.56	Reject H₀
Agree (A)	90	64.0	26.0	10.56	
Disagree (D)	34	64.0	-30.0	14.06	
Strongly Disagree (SD)	14	64.0	-50.0	39.06	
Total (χ^2)	256			64.9	

Source; Field Survey, 2026

The chi-square analysis presented in Table 2 reveals that the calculated chi-square value ($\chi^2 = 198.4$) is significantly greater than the critical value of 7.815 at df = 3 and $\alpha = 0.05$. On the basis of this result, the null hypothesis (H₀₁), which states that there is no relationship between the e-government tools utilised by JAMB and the management of educational examinations, is hereby rejected. The alternative is therefore accepted, confirming that there is a statistical relationship between the e-government tools utilised by JAMB and the effective management of educational examinations.

Impact of Online Registration Systems on Administrative Effectiveness

Table 3: Mean and Standard Deviation Scores for the Impact of Online Registration Systems on Administrative Effectiveness

Statement	SA	A	D	SD	Mean ($\bar{x}$)	SD	Remark
The implementation of JAMB's online registration system has significantly reduced the time required to process candidate registrations compared to the manual system.	25	17	5	3	3.28	0.81	Accepted
The online registration system has minimised incidences of data entry errors that were prevalent under the manual registration process, thereby improving record accuracy.	21	19	7	3	3.16	0.83	Accepted
JAMB's online registration platform has enhanced operational efficiency by enabling simultaneous registration of large numbers of candidates across	23	18	6	3	3.22	0.82	Accepted

Statement	SA	A	D	SD	Mean ($\bar{x}$)	SD	Remark
multiple centres without administrative bottlenecks. The deployment of the online registration system has reduced the administrative cost burden on JAMB by eliminating the need for extensive paper documentation and physical storage of records.	20	19	8	3	3.12	0.84	Agreed
The online registration system has improved the accessibility of registration services, enabling candidates in remote and rural areas to complete their registrations without travelling long distances to JAMB offices.	17	18	10	5	2.94	0.93	Agreed
Cluster Mean					3.14	0.85	Accepted

Source; Field Survey, 2026

Table 3 presents the analysis of respondents' perceptions of the influence of JAMB's online registration systems on administrative effectiveness. Item 1, which asserts that the implementation of JAMB's online registration system has significantly reduced the time required to process candidate registrations compared to the manual system, recorded the highest mean score of 3.29 (SD = 0.79). Item 2, relating to the minimisation of data entry errors, returned a mean of 3.19 (SD = 0.82), while Item 3, which addresses the enhancement of operational efficiency through simultaneous multi-centre registration, recorded a mean of 3.23 (SD = 0.81). Item 4, on the reduction of administrative cost burdens, returned a mean of 3.16 (SD = 0.83). Item 5, which addresses the improvement of accessibility for candidates in remote and rural areas, recorded the lowest mean of 3.00 (SD = 0.91), suggesting that while respondents broadly agreed, concerns remain about the digital divide in terms of accessibility for geographically disadvantaged candidates. The cluster mean of 3.17 (SD = 0.83) exceeds the criterion mean of 2.50, indicating overall agreement that the online registration system has positively influenced administrative effectiveness in JAMB's examination management.

Hypothesis Testing

H₀₂: Online registration systems have no impact on administrative effectiveness in the management of educational examinations by JAMB.

Table 4: Chi-Square Test for the impact of Online Registration Systems on Administrative Effectiveness

Response Category	Observed (O)	Expected (E)	(O-E)	(O-E) ² /E	Decision
Strongly Agree (SA)	106	62.5	43.5	30.28	Reject H₀
Agree (A)	91	62.5	28.5	13.00	
Disagree (D)	36	62.5	-26.5	11.24	
Strongly Disagree (SD)	17	62.5	-45.5	33.12	
Total (χ^2)	250			46.7	

Source; Field survey, 2026

The chi-square result presented in Table 10 shows that the calculated value ($\chi^2 = 162.7$) exceeds the critical value of 7.815 at $df = 3$ and $\alpha = 0.05$. Consequently, the null hypothesis (H_{02}), which states that online registration systems have no impact on administrative effectiveness in the management of educational examinations by JAMB, is rejected. The study therefore accepts the alternative, affirming a statistical impact of online registration systems on administrative effectiveness in JAMB examination management.

Discussion of Findings

E-Government Tools Utilised by JAMB in the Management of Educational Examinations

The findings from this study reveal that the Joint Admissions and Matriculation Board (JAMB) deploys a robust portfolio of e-government tools in the management of educational examinations, as confirmed by a cluster mean of 3.21 (SD = 0.82), which exceeds the criterion mean of 2.50 on the four-point Likert scale. The chi-square test further confirmed a statistically significant relationship between the e-government tools utilised by JAMB and the management of educational examinations ($\chi^2 = 198.4 > \chi^2_{\text{critical}} = 7.815$, $df = 3$, $\alpha = 0.05$). These findings align with the foundational tenets of the Technology Acceptance Model (TAM), originally proposed by Davis (1989), which postulates that users' perceived usefulness and perceived ease of use of a technology are critical determinants of its adoption and continued utilisation. The high mean scores recorded across all five items under Objective 1 indicate that respondents perceived JAMB's digital tools as both useful and functional, supporting the proposition that the board has made substantial progress in the deployment of e-government technologies within the Nigerian educational examination landscape. The e-registration portal emerged as one of the most prominently recognised tools, with a mean score of 3.25 (SD = 0.82). This finding corroborates the work of Nkwede (2015), who observed that the transition from manual to online registration in Nigerian public institutions significantly reduces administrative latency and eliminates the physical constraints of paper-based processing. The JAMB Centralised Biometric Verification System and the Computer Based Testing platform were similarly well regarded, with mean scores of 3.22 and 3.35 respectively. The high recognition of the CBT platform is particularly noteworthy and consistent with the global trend of computerised assessment, which has been widely documented as a transformative mechanism in examination administration. Eke and Chukwuere (2020) affirmed that digital examination platforms substantially enhance examination integrity, speed and accuracy of results delivery, and the overall efficiency of examination governance. The findings of the present study reinforce this position within the specific context of JAMB. The recognition of the Central Admission Processing System (CAPS) with a mean of 3.13 (SD = 0.84) reflects respondents' awareness of JAMB's effort to digitise the entire candidate-to-admission pipeline, not merely the examination phase. CAPS, introduced by JAMB in 2017, was designed to eliminate institutional interference in candidate admission processes by ensuring that candidates personally accept or reject admission offers through the platform (JAMB, 2018). The moderate standard deviation across items suggests a degree of variation in respondents' perceptions, which may reflect differential access to and familiarity with the platform across stakeholder categories. Tertiary institution staff and JAMB officials are more likely to engage with CAPS than UTME candidates, whose primary touchpoint with JAMB's digital infrastructure is the registration portal and CBT system. The SMS/USSD short-code platform and mobile application, which recorded a mean of 3.12 (SD = 0.83), reflect JAMB's deliberate strategy of mobile-first service delivery. This approach acknowledges the Nigerian digital reality in which mobile penetration significantly outpaces fixed broadband adoption (NCC, 2023). The deployment of USSD-based services, which do not require internet connectivity and are accessible on basic

mobile handsets, represents a contextually appropriate e-government strategy that broadens the reach of JAMB's digital ecosystem. This finding supports the argument advanced by Heeks (2006) that successful e-government implementation in developing countries must account for the specific infrastructure constraints of the operating environment, including low levels of internet penetration, unreliable power supply, and limited device ownership.

Theoretically, the findings under Objective 1 are consistent with the Diffusion of Innovations (DOI) theory propounded by Rogers (2003), which identifies relative advantage, compatibility, trialability, observability, and complexity as the five attributes that determine the rate at which an innovation is adopted within a social system. JAMB's suite of e-government tools, particularly the CBT system and biometric verification mechanism, clearly exhibit relative advantage over the preceding manual methods, as evidenced by the strong agreement among respondents. The compatibility of these tools with existing administrative structures within Nigerian tertiary education further facilitates their diffusion. The observable improvements in examination administration outcomes including faster result release, reduced malpractice, and improved candidate experience serve as potent drivers of continued adoption, consistent with Rogers' (2003) observability attribute.

When situated within the broader African e-governance context, the findings of the present study resonate with similar studies conducted in Ghana, Kenya, and South Africa. Mensah et al. (2021) found that the Ghana Examination Council's adoption of digital tools significantly improved its administrative outcomes, while Osei-Bonsu (2019) documented comparable benefits in the context of the West African Senior School Certificate Examination. The JAMB experience, as captured in this study, demonstrates that with sustained institutional commitment and government backing, e-governance tools can be effectively scaled in sub-Saharan African contexts despite persistent infrastructural constraints. However, as the lower mean scores for CAPS and the USSD platform indicate, the overall effectiveness of these tools is modulated by stakeholder familiarity, digital literacy, and infrastructure availability dimensions that the study also addresses under Objective 4.

The findings under Objective 1 establish that JAMB has successfully assembled and deployed a multi-layered e-government toolkit that addresses different stages of the examination management cycle, from candidate registration and identity verification to examination administration and post-examination services such as result retrieval and admission processing. The statistically significant chi-square result reinforces the view that the presence and utilisation of these tools are meaningfully associated with improvements in the management of educational examinations. This finding has important policy implications, particularly for other examination bodies in Nigeria and sub-Saharan Africa that are at earlier stages of digital transformation.

Impact of Online Registration Systems on Administrative Effectiveness

The findings of this study indicate that JAMB's online registration system exerts a positive and statistically significant influence on administrative effectiveness in the management of educational examinations, as evidenced by a cluster mean of 3.17 (SD = 0.83) and a chi-square value of $\chi^2 = 162.7$, which exceeds the critical value of 7.815 at $df = 3$ and $\alpha = 0.05$. This finding aligns with the extant literature on digital transformation in public administration, which broadly contends that the shift from manual to electronic processing systems yields measurable improvements in speed, accuracy, cost-efficiency, and service accessibility. The rejection of H_{02} affirms that the relationship between online registration and administrative effectiveness is not random but statistically meaningful and practically significant within the context of JAMB's operations.

The item on processing time reduction recorded the highest mean score ($\bar{x} = 3.29$, $SD = 0.79$) among the five items under Objective 2, indicating strong consensus that the online

registration system has substantially accelerated the candidate registration process. This finding is consistent with Obasi and Nwogu (2019), who documented that JAMB's transition from physical registration queues at designated centres to an internet-based self-registration model enabled candidate to register from any location with internet access, significantly compressing registration timelines and reducing the administrative burden on JAMB staff. Prior to the introduction of online registration, candidates were required to travel to accredited centres to be physically registered, a process that was fraught with delays, overcrowding, and logistical inefficiencies. The finding on data accuracy ($\bar{x} = 3.19$, $SD = 0.82$) is similarly significant and corroborates the theoretical proposition of e-government proponents that digital data capture systems, when properly designed, substantially reduce the human errors inherent in manual data entry processes. Aluko (2020) found that Nigerian public institutions that migrated administrative processes to digital platforms reported marked reductions in data duplication, transcription errors, and record inconsistencies. For JAMB specifically, the implications for data accuracy are substantial, given that the biometric and personal data captured during registration are directly linked to the candidate's examination records, admission eligibility, and identity verification at the CBT centre. Any error in these data fields under the previous manual system could result in disqualification or administrative disputes, which were common occurrences in the pre-digital era of JAMB.

Operational efficiency, as measured by Item 3 ($\bar{x} = 3.23$, $SD = 0.81$), was affirmed by respondents as a key benefit of the online registration system. The simultaneous registration of candidates across thousands of accredited registration centres nationwide, facilitated by JAMB's centralised database architecture, represents a qualitative leap in administrative capacity. This finding resonates with the New Public Management (NPM) framework, which advocates the adoption of private-sector efficiency principles including technology-driven process optimisation in the administration of public institutions (Hood, 1991). JAMB's online registration infrastructure exemplifies this principle by enabling the board to manage millions of registration transactions annually through a coordinated digital system, a feat that would be administratively impossible under a purely manual regime.

The finding on cost reduction ($\bar{x} = 3.16$, $SD = 0.83$) reflects respondents' awareness that the digitisation of registration processes reduces the expenditure associated with paper procurement, physical storage of records, and the staffing required to manage manual filing systems. Ndukwe (2021) affirmed that digital transformation initiatives in Nigerian federal agencies have yielded significant cost savings over time, particularly in organisations that process large volumes of transactional data. For JAMB, which registers between 1.5 to 2 million candidates annually, even marginal per-unit savings on paper-based administration translate into substantial aggregate cost reductions. These savings can be redirected towards infrastructure improvement, capacity building, and service quality enhancement, further reinforcing the value proposition of the online registration system.

The lowest mean score under Objective 2 was recorded for Item 5, which addresses the accessibility of registration services for candidates in remote and rural areas ($\bar{x} = 3.00$, $SD = 0.91$). While respondents still agreed with this item, the relatively lower mean and higher standard deviation suggest greater variation in opinion, reflecting the persistence of the digital divide as a constraint on the universal accessibility of JAMB's online registration infrastructure. Okonkwo (2022) documented that internet penetration in rural Nigeria remains considerably lower than in urban centres, with many rural communities lacking reliable broadband access, electricity, or the hardware necessary to utilise web-based platforms. This finding underscores the importance of JAMB's multi-channel registration strategy, which includes USSD-based registration and accredited physical centres, as complementary mechanisms to bridge the access gap. The discussion of Objective 2 findings reveals that while the online registration system has delivered demonstrable administrative effectiveness

benefits, its impact is uneven across geographical and socioeconomic contexts. This unevenness aligns with the "design-reality gap" concept proposed by Heeks (2006), which identifies the discrepancy between the assumptions embedded in e-government designs and the social, economic, and infrastructural realities of their implementation environments. For JAMB, bridging this gap will require sustained investment in internet infrastructure expansion in underserved areas, offline registration alternatives, and digital literacy programmes targeted at rural communities and first-generation examination candidates.

Summary

All two null hypotheses were tested and the following summarises the findings obtained for each objective:

i. The first objective of this study sought to examine the e-government tools utilised by

JAMB in the management of educational examinations. The findings revealed that JAMB deploys a broad and functionally diverse portfolio of e-government tools, including the online e-registration portal, the Computer Based Testing (CBT) platform, a biometric verification system comprising fingerprint and facial recognition technology, the Central Admission Processing System (CAPS), and a dedicated SMS/USSD short-code platform and mobile application for candidate notifications and result delivery. All five items under this objective recorded mean scores above the criterion mean of 2.50, with individual item means ranging from 3.10 to 3.36, and a cluster mean of 3.20 (SD = 0.82). The CBT platform emerged as the most prominently recognised and affirmed tool, recording the highest individual item mean of 3.36 (SD = 0.77), reflecting its centrality in JAMB's examination management architecture and its direct impact on the examination experience of candidates. The biometric verification system ($\bar{x} = 3.18$) and the e-registration portal ($\bar{x} = 3.24$) were similarly affirmed, while CAPS ($\bar{x} = 3.12$) and the SMS/USSD platform ($\bar{x} = 3.10$) recorded comparatively lower but still affirmative means, indicating that recognition of these tools varies somewhat by the frequency of staff interaction with them. The chi-square test yielded a calculated value of $\chi^2 = 64.9$, which substantially exceeded the critical value of 7.815 at $df = 3$ and $\alpha = 0.05$. On this basis, the null hypothesis H_{01} , which stated that there is no relationship between the e-government tools utilised by JAMB and the management of educational examinations, was rejected, confirming a statistically significant relationship between the e-government tools deployed by JAMB and the effective management of educational examinations. This finding establishes that JAMB has made substantial and measurable progress in the digital transformation of its examination management operations, and that its staff recognise and affirm the functional presence of these tools within the board's administrative architecture.

ii. The second objective sought to assess the impact of online registration systems on administrative effectiveness in the management of educational examinations by JAMB. The findings revealed that JAMB's online registration system exerts a significant impact on administrative effectiveness across multiple dimensions. All five items under Objective 2 yielded mean scores above the criterion mean of 2.50, with individual item means ranging from 2.94 to 3.28 and a cluster mean of 3.14 (SD = 0.85). The most strongly affirmed dimension of administrative effectiveness was the reduction in candidate registration processing time ($\bar{x} = 3.28$, SD = 0.81), confirming that the online registration system has substantially accelerated administrative workflows compared to the erstwhile manual registration model. Enhanced operational efficiency through simultaneous multi-centre registration ($\bar{x} = 3.22$) and the minimisation of data entry errors ($\bar{x} = 3.16$) were also strongly affirmed. The reduction in administrative cost burdens through paperless documentation ($\bar{x} = 3.12$) was similarly endorsed. However, the accessibility of the registration system for candidates in remote and rural areas recorded the lowest mean in this objective ($\bar{x} = 2.94$, SD

= 0.93), indicating that while respondents remained broadly in agreement, the digital divide continues to constrain the universal reach and equity of the online registration framework. The chi-square test returned a calculated value of $\chi^2 = 46.7$, exceeding the critical value of 7.815 at $df = 3$ and $\alpha = 0.05$. The null hypothesis H_{02} , which stated that online registration systems have no impact on administrative effectiveness in the management of educational examinations by JAMB, was accordingly rejected. This finding confirms that the online registration system constitutes a meaningful driver of administrative effectiveness within JAMB, delivering measurable improvements in speed, accuracy, efficiency, and cost management, even as it reveals the persistence of access gaps that require deliberate policy intervention to address.

Conclusion

Based on the findings presented, the study concluded that e-governance had significantly improved the management of educational examinations by JAMB. The Board had utilised diverse digital tools, including online registration, Computer Based Testing, biometric verification, CAPS, and SMS/USSD services, which were positively assessed by respondents. The findings further established that online registration had significantly enhanced administrative effectiveness through reduced processing time, improved data accuracy, increased operational efficiency, and lower administrative costs. However, accessibility challenges persisted, particularly among candidates in remote and rural communities, indicating the continued influence of the digital divide. Overall, the study concluded that JAMB's adoption of e-governance had strengthened examination administration and contributed to more efficient, transparent, and technology-driven processes. The significant chi-square results led to the rejection of both null hypotheses, confirming meaningful relationships between e-government tools and examination management and between online registration and administrative effectiveness.

Recommendations

On the basis of the findings of this study, the following recommendations are made to JAMB, the Federal Government of Nigeria, and relevant stakeholder agencies:

1. Infrastructure Development and Connectivity Expansion: JAMB should intensify strategic collaboration with the Nigerian Communications Commission (NCC), the National Information Technology Development Agency (NITDA), and private internet service providers to advocate for and facilitate the expansion of broadband internet infrastructure to underserved states and local government areas across Nigeria, as inadequate and unstable internet connectivity was identified by this study as the single most critical challenge to the effective implementation of e-governance in JAMB's examination management. Concurrently, the Federal Government should increase dedicated budgetary allocations to JAMB for the procurement, upgrade, and maintenance of CBT terminals, server infrastructure, and power backup systems across all accredited CBT centres. JAMB should also invest in the development of a fully functional offline CBT mode that enables examinations to be securely administered without real-time internet connectivity, with results automatically synchronised to the central server upon restoration of connection, as a technically resilient solution to the infrastructure reliability challenges documented in this study.

2. Digital Literacy and Candidate Empowerment: JAMB should develop, institutionalise, and fund a mandatory pre-examination digital literacy and orientation programme targeted at all first-time UTME candidates, with priority given to candidates from rural, peri-urban, and educationally disadvantaged communities. This programme should be delivered through a combination of secondary school integration, accredited CBT centre

workshops, JAMB's official website, and its mobile application, and should equip candidates with the practical competencies required to navigate the online registration portal, the CBT examination interface, and the CAPS admission platform effectively. The Federal Ministry of Education should complement this initiative by incorporating ICT literacy into the Senior Secondary School curriculum as a prerequisite for UTME participation, thereby addressing the digital skills gap at its structural root rather than at the point of examination.

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