THE IMPACT OF JAMB UTME ITEM BANK ON TECHNOLOGY INTEGRATION AND TEST ADMINISTRATION IN NIGERIA EDUCATIONAL ASSESSMENT

BY

ABEEB IBRAHIM ADEYEMI

JOINT ADMISSIONS AND MATRICULATION BOARD

INTRODUCTION

The Joint Admissions and Matriculation Board (JAMB) in Nigeria is always coming up with new ways to make sure its tests follow international standards. In order to control admissions to Nigerian post-secondary institutions, the Unified Tertiary Matriculation Examination (UTME) is administered by the Joint Admissions and Matriculation Board (JAMB), which was founded in 1978. Exam misconduct, missing scripts, and delayed result processing were among the issues JAMB encountered when it first relied on paper-and-pencil examinations (PPT). In order to solve these problems, JAMB began using a Computer-Based Test (CBT) method in 2013 and completed its deployment by 2015.

Since the inception JAMB CBT examination, the Board has started compiling a pool of more than 1000 test items in each of the 25 subjects that were examined so that it could deployed to the candidates during the examination. The item bank contains tests for every item as well as comprehensive details on the test's creation and psychometric properties. Testing becomes more adaptable and suitable when an item bank has created calibrated test items. The reason for this is because various applicant groups can take their exams at various, flexible times, and the results are compared using the same scale. Without item banks, it is hard to envision how the UTME exams would be administered. To ensure that the contents of the UTME exams are safe and up to date, a comprehensive collection of test questions and the elements that comprise them is essential. Boards and subject matter experts can use a variety of tools provided by conventional UTME item banking systems to help with the creation, evaluation, modification, and selection of test questions.

JAMB ITEM BANK

An item bank is defined as a sizable collection of high-quality test items whose quality has been evaluated and understood, and which are methodically kept on a computer system for use in evaluating candidates in order to gauge their aptitude or level of success. The JAMB UTME item bank is a computerized collection of test developed items and psychometrically calibrated test questions that facilitates safe and consistent question creation. All of the difficulties related to evaluations are significantly reduced by the implementation of item banking technology.

a. Item pool: The collection of questions categorized by subject, difficulty level, and cognitive domain (e.g., knowledge, comprehension, application, analysis).

b. Metadata: Information attached to each item, such as subject area, level of difficulty, year of creation, validation results, etc.

c. Security features: Encryption, restricted access, and tracking mechanisms to prevent unauthorized use.

d. Review and validation records: Documentation of expert reviews, trial tests, and psychometric analysis (such as item difficulty index and discrimination index).

It contributes to raising the caliber of both the merchandise and the evaluations. When the item bank is used effectively, it eliminates the need to prepare fresh things each time a test is to be administered. Thus, test items may be arranged on a similar scale thanks to item banking. The objects' relative difficulty is indicated by the scale.

RESEARCH OBJECTIVES

This study's main goal is to investigate how the JAMB UTME item bank affects test administration and technological integration in Nigeria's educational evaluation system. The particular goals are:

- To examine the role of the JAMB UTME item bank in facilitating the adoption and implementation of Computer-Based Testing (CBT) in Nigeria.
- To assess the impact of the item bank on the efficiency, security, and scalability of UTME test administration.
- To identify the challenges associated with the implementation of the item bank and propose actionable solutions to enhance its effectiveness in Nigeria’s educational assessment system.

SIGNIFICANCE OF THE STUDY

Many parties, including educators, legislators, and assessment organizations, will find great value in analyzing how the JAMB UTME item bank affects test administration and technological integration in Nigeria's educational assessment system. First of all, this study offers a paradigm for other developing countries looking to update their assessment systems by shedding light on how the item bank has aided in the implementation of computer-based testing (CBT). In order to preserve public confidence in educational evaluations, the study emphasizes the item bank's function in improving examination security and efficiency, which in turn helps to reduce malpractices and improve result processing.

Second, the study highlights enduring issues including digital inequalities and poor ICT infrastructure, which are essential for guiding focused actions to provide fair access to technology-driven evaluations. The results provide evidence-based suggestions for JAMB and comparable organizations to maximize item bank use, improving scalability and equity. Furthermore, this study adds to the larger conversation about integrating technology into education in settings with limited resources, laying the groundwork for further research on the digital transformation of evaluation systems.

METHODOLOGY

The descriptive survey design was adopted for the study on the JAMB UTME item bank affects test administration and technological integration in Nigeria's educational. The population of the study comprised the staff of Test Development Department, Test Administration Department, Psychometrics Department, Information Technology Services (ITS) Department, Quality Assurance Department and other relevant stakeholders engaged in the process of items bank and UTME test administration. The instrument for data collection was an item structured questionnaire designed by the researchers. Each of the items structured based on the research objectives of the study. The instrument was face validated by the researcher with the staff of the various departments. The internal consistency of the instrument was determined using the Cronbach Alpha Method and reliability coefficients for the clusters were as follows; cluster A: 0.85 cluster B: 0.82 and cluster C: 0.85 with the overall co-efficient of 0.84. Data collected was analyzed using the SPSS (version 24) to answer the hypothesis formulated at 0.5 level of significance while the hypothesis was accepted if the table value is greater than or equal to the calculated or critical value and rejected if otherwise.

LITERATURE REVIEW

JAMB and the Evolution of UTME

The purpose of the Joint Admissions and Matriculation Board (JAMB), which was founded in 1978, was to standardize admissions to Nigerian universities, polytechnics, and colleges of education (JAMB, 2018). At first, the Unified Tertiary Matriculation Examination (UTME) used paper-and-pencil tests (PPT), which had several problems, such as irregularities in the testing process, missing scripts, and delays in processing results (Oluwasanumi, 2014). These problems led JAMB to switch to a Computer-Based Test (CBT) system, which was fully implemented by 2015 after a limited deployment in 2013. The JAMB UTME item bank was a crucial part of the transition to CBT, which was motivated by the desire to improve test administration's scalability, security, and efficiency. In order to solve the persistent problems of question leaking and cheating that were common in the PPT period, the item bank allowed JAMB to create randomized, secure test forms.

LITERATURE REVIEW CONT.

Item Banking in Educational Assessment

A digitized collection of test questions that have been psychometrically assessed and used to create standardized assessments is called an item bank (Academia, 2015). The UTME item bank for JAMB includes more than 1,000 calibrated items for each of the 23 disciplines, allowing for the construction of distinct test forms for every applicant. By reducing the possibility of question leaks and guaranteeing fairness through psychometrically sound questions, this randomization improves test security. Item banking facilitates extensive testing by lowering administrative costs and permitting flexibility in test design. With over 2 million participants enrolled for the 2025 UTME, 98% of whom took the UTME examination has benefited greatly from the item bank's ability to scale the exam to accommodate millions of candidates each year. Because it makes it easier to apply Item Response Theory (IRT) to guarantee test validity and reliability, the item bank also complies with worldwide best practice.

LITERATURE REVIEW CONT.

Technology Integration in Educational Assessment

Utilizing digital tools to create, administer, and assess tests is known as technology integration in educational assessment. JAMB's adoption of CBT is in line with global trends toward digital testing and offers advantages like automated scoring, quick result processing, and cost effectiveness. For example, JAMB's CBT system has shortened the turnaround time for results to a week, as opposed to months under the PPT system.

A data-based system is created by the data processing personnel after each test item is calibrated and equated to the parallel form. Additional tasks include educating and retraining employees, using computers, creating a database system, executing packaged programs, and becoming familiar with IRT and different logistic models. Planning an item bank also requires the employment of assessors, who are staff members who can critically assess test items for technical quality, curriculum fit, uni-dimensionality, and possible bias. The calibration of the things comes last but certainly not least. Test objects must be shown to examinees with a variety of skill levels in order to properly calibrate them and create scales.

THEORETICAL FRAMEWORK

The Technology Acceptance Model (TAM) and the Diffusion of Innovations (DOI) Theory serve as the foundation for the investigation of how the JAMB UTME item bank affects test administration and technology integration in Nigeria's educational assessment system. These frameworks offer a strong perspective for examining the uptake, application, and difficulties of technologically advanced evaluation tools such as the JAMB item bank.

Adoption of the JAMB UTME item bank offers a relative advantage over traditional PPT by reducing malpractices and enabling rapid result processing. Rogers (1962) proposed the Diffusion of Innovations Theory, which describes the five stages of adoption: knowledge, persuasion, decision, implementation, and confirmation. The theory also identifies factors that influence diffusion, such as relative advantage, compatibility, complexity, trial-ability, and observe-ability.

THEORETICAL FRAMEWORK CONT.

Integration of TAM and DOI to the Study

TAM and DOI together provide a thorough foundation for this investigation. While DOI looks at the larger systemic elements impacting the item bank's dissemination across JAMB's operations and stakeholder groups, TAM concentrates on the individual perceptions that drive acceptance of the item bank. Collectively, they clarify how the perceived advantages (like efficiency and security) and drawbacks (like infrastructure deficiencies) of the item bank has influence on test administration and technology integration. In order to guarantee the successful implementation of the JAMB UTME item bank, this dual framework directs the examination of empirical data and provides guidance for suggestions for removing obstacles, such as enhancing ICT infrastructure and stakeholder training.

DATA PRESENTATION

Table 1.1

The role of Item Bank in Technology Integration on JAMB UTME

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	CBT Adoption Rates	101	26.5	26.5	26.5
	Psychometric Standard	235	61.7	61.7	83.5
	Scalability	45	11.8	11.8	95.3
	Total	381	100.0	100.0	

According to table 1.1 above, CBT adoption rates are rising quickly in all of Nigeria's states. CBT was utilized by 2,030,627 million UTME candidates in 2025, which marked a substantial change from the paper-and-pencil test (PPT) system that had been in use until 2013. The item bank facilitates randomized test production for CBT delivery, with more than 1,000 calibrated test items per topic across 25 UTME subjects. Item Response Theory (IRT) is used by the psychometrically standardized JAMB item bank to guarantee that test items are valid, fair, and dependable while adhering to international assessment standards. Because of the item bank's scalability, JAMB can create customized test forms for millions of applicants, allowing for extensive testing without sacrificing quality.

DATA PRESENTATION

The role of Item Bank in Technology Integration on JAMB UTME

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Examination Security	99	26.0	26.0	26.0
	Cost Efficiency	74	19.4	19.4	45.4
	Stakeholders feedback	99	26.0	26.0	71.4
	Result processing Efficiency	109	28.6	28.6	100.0
	Total	381	100.0	100.0	

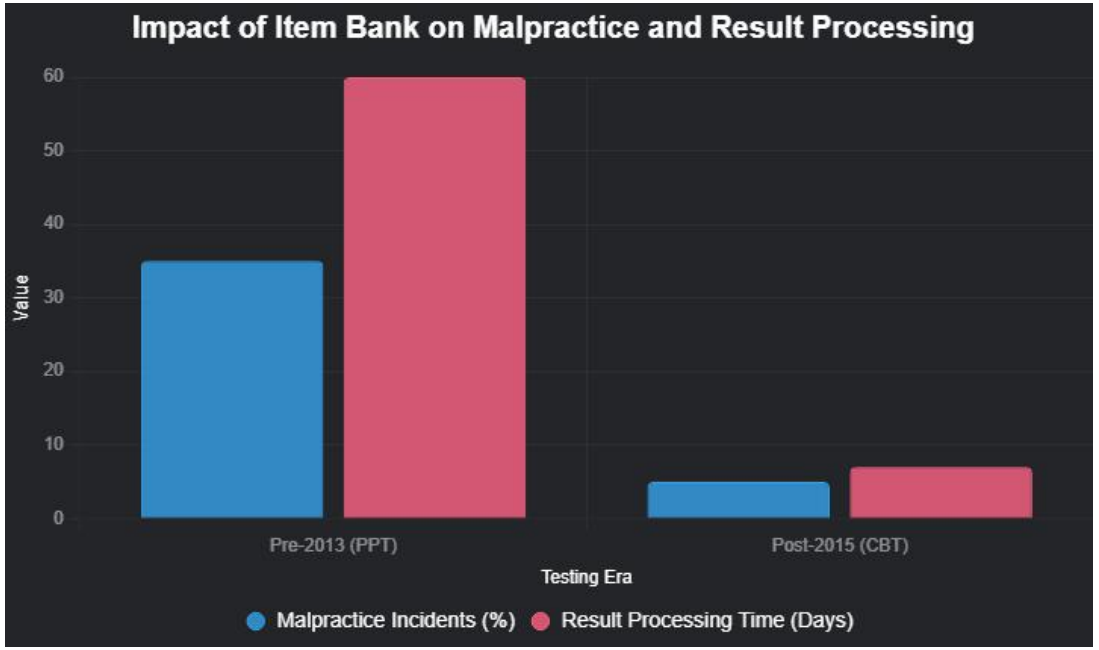
Table 1.2 demonstrates how the item bank aids JAMB in ensuring exam security during UTME. Exam misconduct has decreased as a result of the randomized selection of questions from the item bank; in 2025 as a result of stricter security measures. The item bank facilitates the management of efficient result processing compared to months under the PPT method, the JAMB UTME result turnaround time was shortened to one week thanks to the item bank-supported CBT. Cost efficiency is decreased by administering tests and managing item banks. The UTME test's stakeholders feedback system shows that public confidence in JAMB's examination procedure has grown, as seen by a decrease in complaints regarding missing scripts and an improvement in service quality

ANALYSIS

Objective 1: Role of Item Bank in Technology Integration

According to the statistics, one of the main factors supporting JAMB CBT adoption in Nigeria has been the UTME item bank. The item bank's capacity to provide extensive, technologically driven examinations is demonstrated by its high acceptance rate, which stands at 98% of applicants utilizing CBT in 2025. The item bank is a trustworthy resource for creating standardized tests as it uses Item Response Theory calibrated items, which guarantee psychometric integrity. With more than 1,000 items per topic, the item bank's scalability allows JAMB to administer distinct test forms to millions of candidates something PPT cannot do. This is consistent with the Technology Acceptance Model (TAM), since administrators accept the item bank because they believe it will facilitate safe and effective testing. However, applicants' differing degrees of computer literacy, especially in rural regions, restrict the perceived ease of use, underscoring the need for more thorough training.

ANALYSIS



Objective 2: Impact on Test Administration

Test administration has been greatly enhanced by the item bank. According to the Minister of Education Dr. Maruf Tunji gives credit to JAMB in her administration of test due to the decrease in malpractices as ascribed to the randomization of questions, which reduces cheating and question leakage. This improves examination security, which is essential to preserving public confidence. In line with worldwide trends in digital assessment, the quick result processing (within a week) shows increased efficiency as compared to the PPT period. The item bank's significance in simplifying administrative procedures is demonstrated by the ₦27 billion in cost reductions between 2017 and 2021. The following chart shows the decrease in malpractice incidents and result processing time from the PPT era (pre-2013) to the CBT era (post-2015). These results confirm the Diffusion of Innovations (DOI) Theory, as the item bank's relative advantage and observability (e.g., reduced malpractices and cost savings) have facilitated its diffusion across JAMB's operations. However, some stakeholders believe that the complexity of CBT systems poses a barrier to full adoption.

FINDINGS

The influence of the JAMB UTME item bank on test administration and technological integration in Nigeria's educational assessment system is examined, and the results show both notable improvements and enduring difficulties. The following is a summary of the main findings:

i. **Facilitation of CBT Adoption**: The switch to computer-based testing (CBT) has been made possible in large part by the item bank; in 2025, 98% of the over 2 million plus UTME candidates used CBT. With 25 UTME subjects and more over 1,000 calibrated items per subject, the item bank facilitates randomized test creation and uses Item Response Theory (IRT) to ensure scalability and psychometric integrity.

ii. **Impact on JAMB UTME Item Bank on Test Administration**: Through increased cost-effectiveness, efficiency, and security, the item bank has improved test administration. With a documented drop in occurrences in 2025, randomized question selection has considerably decreased examination malpractices. Compared to months under the paper-and-pencil exam (PPT) approach, automated scoring using CBT has reduced result processing time to under a week.

FINDINGS

iii. **Challenges in Implementation JAMB UTME Item Bank**: Notwithstanding its advantages, there are obstacles to the item bank's adoption, such as poor ICT infrastructure, which causes power outages and erratic internet to interfere with the delivery of CBT, especially in rural regions. Inequities are exacerbated by the digital divide, which restricts access for candidates from rural areas who lack computer literacy. Biometric verification concerns in 2025 prohibited some applicants from participating, prompting rescheduling.

CONCLUSION

By supporting the use of Computer-Based Testing (CBT) and improving test administration, the JAMB UTME item bank has fundamentally changed the landscape of educational evaluation in Nigeria. The item bank has decreased examination malpractices, increased the efficiency of processing results, and achieved cost savings by allowing randomized test generation. JAMB assessment system is in line with international norms due to its scalability and psychometric integrity, which are reinforced by more than 1,000 calibrated items each topic.

But problems like poor ICT infrastructure, digital divides, problems with biometric verification, and low computer literacy that makes people resistant to CBT still exist, especially in rural areas. In order to guarantee fair access and successful implementation, these obstacles must be addressed through enhanced infrastructure and stakeholder participation, according to the Technology Acceptance Model (TAM) and Diffusion of Innovations (DOI) Theory (Davis, 1989, Rogers, 1962). The item bank's revolutionary potential places JAMB as a pioneer in technology-driven assessment in Africa, but overcoming these obstacles is vital to sustaining and growing its effect.

RECOMMENDATIONS

To enhance the benefits of the JAMB UTME item bank and alleviate identified issues, the following recommendations are suggested:

i. **Invest in ICT Infrastructure**: Particularly in remote regions, the government and JAMB should give priority to investments in dependable power supplies and internet connectivity at CBT centers in order to reduce technical interruptions and guarantee smooth test administration.

ii. **Enhance Staff and Stakeholder Training**: JAMB should provide frequent training programs for staffs, applicants, examiners, and administrators to promote computer literacy and lessen resistance to CBT, addressing the poor perceived ease of use observed in TAM.

iii. **Adopt a Hybrid Model**: To bridge the digital divide, JAMB could consider a phased hybrid PPT-CBT model in areas with limited technology access, ensuring equitable participation for rural candidates while maintaining the item bank's benefits.

iv. **Strengthen Item Bank Maintenance**: Continuous calibration and updating of the item bank are essential to ensure its psychometric integrity and alignment with evolving educational standards, enhancing test reliability and validity.

v. **Engage Stakeholders**: Collaboration with universities, regulatory bodies, and technology experts can improve the item bank's design and implementation, addressing technical and logistical challenges through shared expertise.

THANK YOU ALL FOR LISTENING !!!