



STAKEHOLDERS' PERCEPTION ON THE ADOPTION OF COMPUTER-BASED TEST (CBT) FOR WEST AFRICAN SENIOR SCHOOL CERTIFICATE EXAMINATION (WASSCE) IN EKITI STATE, NIGERIA

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Abstract

The study examined stakeholders' perceptions of the adoption of the Computer-Based Test (CBT) system for the West African Senior School Certificate Examination (WASSCE) in Ekiti State, Nigeria. A descriptive survey design was employed. The population comprised public and private secondary school students, teachers, and school proprietors in the area. A total of 300 respondents were purposively selected. Data were collected using a validated instrument titled the Stakeholders' Perception of CBT Adoption Scale (SPCAS) with a reliability coefficient of .87 (Cronbach's α). Findings revealed that among the stakeholders, the teachers showed a negative perception (50.3%) of adoption of CBT, while the students and school owners reported a positive perception of 45.8% and 53.3%. Acceptance level of CBT indicated that the students (36%) and school owners (46.3%) had a high level of acceptance of CBT for WASSCE. 72.2 % of teachers indicated a low level of acceptance, and 16.6% indicated a high level of acceptance of CBT in the study area. Major concerns identified included unreliable electricity supply (83.9%), insufficient ICT facilities (79.4%), poor technical support (73.8%), and limited digital literacy among students (71.5%). In contrast, perceived benefits such as improved examination integrity (41.6%) and faster result processing (38.9%) were considered minimal. A one-way analysis of variance (ANOVA) showed a statistically significant difference in perception among stakeholder groups, $F = 5.16$, $p < .05$. The study concluded that stakeholders in Oye-Ekiti, especially the teachers, perceive the adoption of CBT for WASSCE unfavourably due to infrastructural deficiencies and inadequate digital readiness. It was recommended, amongst others, that WAEC should conduct an

intensive computer- based test trial in all the centres and education authorities should address these challenges in implementation.

Keywords: Perception, Acceptance, Examination, Standardized Test, Computer-Based Test, WASSCE, Stakeholders.

Introduction

Education is the transfer of knowledge skill from one person to another in order to bring about changes in behaviour. This involves the application of a systematic process, which involves the stakeholders in education which includes; teacher, government, students, school managements, and examination bodies. Also, the process in educational activities cannot be complete without an educational assessment. According to Joshua (2019), educational assessment is a systematic manner of providing judgment and evaluation on the learners, teachers, and program. Educational testing is the process of presenting quality test items to testees for the purpose of assessing their ability level in a subject area. This can be done either at the beginning or at the end of a period of learning. This explains why it cannot be done like magic, because it requires the use of test items, which must be presented to testees in order to elicit sample behaviour.

A test is an instrument in the hands of any teacher that enables he/she carryout any educational assessment (Ubi and Udemba 2021). A test is a vital tool in education that is used to elicit information about the sampled behaviour of testees about a particular subject matter. A test is made up of items used to determine a person's ability, knowledge, or performance in a given domain. Thus, a test is referred to as a tool, technique, or method to measure students' ability, knowledge, and performance. In other words, it is used to measure students' abilities or competencies. Testing is a process that is administered to measure students' ability to perform in a particular field within a certain time limit with a specific goal. Tests are of different types: summative test, formative test, power test, speed test, objective, easy, open, and closed test; achievement tests are teacher-made or standardized tests (Leonard et al,2023)

Test organizations in Nigeria (also regarded as examination bodies) are organizations that are given the mandate to conduct placement examinations in the form of learning assessments for Nigerian students. This assessment aims to admit students into different institutions of learning at different levels of the Nigerian educational system. The National Board for Educational Measurement was a professional organization that oversaw the assessment processes to ensure that the assessment process is fair.

- It is an organization that checks the activities of examinations.
- This body is also involved in educational measurement by measuring how standardized tests are and the viability of performance-based assessments.
- The test organization is responsible for all the activities in the test process.
- The organization defines the test functions, test facilities, and test activities.
- It defines the competencies and knowledge of the people involved.
- They also help in educational assessment design and implementation

Test preparation involves very careful steps to follow so as not to produce a test that will not be able to serve the purpose. This is why test construction is always handled by experts, such as individuals (teachers) or organizations. Examples of examination bodies in Nigeria are the Joint Admissions and Matriculation Board (JAMB), the National Examination Council (NECO), the West African Examination Council (WAEC), the National Business and Technical Examination Board (NABTEB), State Education Board in charge of the First School Leaving Certificate examination (FSLC) in each state.

The shift toward technology-driven assessment systems has become an integral part of global educational reforms. Computer-Based Testing (CBT) offers numerous advantages, including enhanced grading accuracy, faster result processing, and reduced examination malpractice (Adebayo and Abdulrahman, 2021). In West Africa, the West African Examinations Council (WAEC) has begun exploring CBT implementation for the West Africa Senior School Certificate Examination (WASSCE). However, the success of this initiative largely depends on stakeholders. Egbe et al. (2023) stated that computer-Based Testing (CBT) offers advantages like enhanced efficiency, reduced examination malpractice, and instant result processing. However, adoption of CBT in West Africa, particularly in Nigeria, might face challenges such as infrastructure limitations, technological literacy, and stakeholder acceptance. Computer-based testing aligns with global trends towards digital assessment (Jamil, 2012).

In recent years, the adoption of technology in educational assessment has become a significant trend across the globe. Traditional paper-based examinations are increasingly being replaced or complemented by computer-based testing (CBT) methods, which leverage digital tools to enhance efficiency, accuracy, and accessibility in the examination process. This paradigm shift is driven by the growing need for faster grading systems, reduced examination malpractices, and improved data management in educational assessment (Ekpo, 2023).

In Nigeria, the introduction of CBT in major public examinations such as the Unified Tertiary Matriculation Examination (UTME) by the Joint Admissions and Matriculation Board (JAMB) has revealed both the potential and challenges of this assessment method. While CBT offers advantages such as instant result processing, improved security, and logistical convenience, it also raises concerns about technological readiness, infrastructure, power supply, and digital literacy among candidates and exam administrators. In the West African sub-region, the West African Examinations Council (WAEC) plays a central role in conducting standardized examinations such as the West African Senior School Certificate Examination (WASSCE). Historically, WAEC has relied on paper-and-pen examinations for assessing candidates across its member countries. However, with advancements in information and communication technology (ICT) (Egbe et al 2023). WAEC has begun exploring and implementing the CBT method for certain examinations, especially for private candidates and in pilot phases. This gradual shift aims to modernize assessment procedures, align with global best practices, and ensure that the educational system keeps pace with technological innovations.

A study by Oyelekan et al. (2019) showed that stakeholders' perceptions play a significant role in the adoption and implementation of Computer-Based Testing (CBT) in

educational settings. The study was carried out using a survey design, and descriptive research statistics were applied to analyse data about JAMB's adoption of CBT in Nigeria. Results revealed that students, teachers, and administrators generally had a positive perception of CBT, citing its potential to enhance efficiency, accuracy, and fairness in assessments. Similarly, a study in Ghana found that students perceived CBT as a more engaging and interactive way of taking exams, which could lead to improved academic performance (Adu-Gyamfi, 2018).

Studies by Jamil (2012) have also reported concerns about the readiness of students, teachers, and infrastructure to support CBT in Nigeria's external examinations, such as JAMB, highlighting that some students felt anxious about taking CBT for the first time due to technical issues and lack of familiarity with the computer-based format. The study found that students from urban settings are at a greater advantage than students in rural settings. Therefore, the study concluded that school location influences the use of CBT in Nigeria. According to Adeyanju and Adeshina (2024), in a survey study of 1,506 students across four Nigerian universities, they reported that 64.3% perceived CBT as useful, 66.1% found it easy to use, and 67% considered it credible.

Research has shown that the level of acceptance of CBT varies among stakeholders in West Africa. A study in Nigeria found that while students were generally accepting of CBT, teachers were more sceptical due to concerns about technical issues and the need for training (Oyelekan et al., 2019). In contrast, a study in Ghana reported that both students and teachers were enthusiastic about adopting CBT, citing its potential benefits for education (Adu-Gyamfi, 2018).

Numerous studies have highlighted the benefits of CBT in West African educational settings. These benefits include: Improved efficiency: CBT can reduce the time and effort required for exam administration, grading, and result processing (WAEC, 2019). Enhanced accuracy: CBT can minimize errors associated with manual grading and result processing (Oyelekan et al., 2019). Increased accessibility: CBT can provide equal opportunities for students with disabilities to participate in assessments (Adu-Gyamfi, 2018). Better assessment of skills: CBT can assess a range of skills, including critical thinking, problem-solving, and digital literacy (Jamil, 2012). Also, a significant benefit perceived by students is that CBT reduces exam malpractice. The study by Muhammad and Hayyo (2023) revealed that 300 sampled students in Kogi State reported that CBT helps prevent impersonation, collusion, leaking, and other forms of malpractice. In a quasi-experimental study among senior secondary students in Abuja, Nigeria, Okoli, Ubangha, and Egberongbe (2022) found that computer-based testing (especially randomized CBT) had effects on student academic achievement.

Despite the benefits, several challenges have been identified by many researchers in the implementation of CBT in West Africa. These challenges include: Infrastructure and technical issues: Inadequate computer infrastructure, internet connectivity, and technical support can hinder the smooth implementation of CBT (Oyelekan, 2019). Digital divide: The unequal access to technology and digital literacy among students, teachers, and schools can create a digital divide, potentially disadvantaging some students (Adu-Gyamfi, 2018). Security concerns: Ensuring the security and integrity of CBT

systems is crucial to prevent cheating and maintain the validity of assessments (JAMB, 2019). Teacher training and support: Providing adequate training and support for teachers to effectively implement and manage CBT is essential (Jamil, 2012).

This study was guided by the Technology Acceptance Model (TAM) proposed by Davis (1989), which states that the adoption of a new technology is influenced by its perceived usefulness and ease of use. The study also draws on the Diffusion of Innovations theory (Rogers, 2003), which explains how new ideas and technologies are adopted and diffused within a social system. These theories are relevant to this study based on the fact that the study is mainly on the adoption of a new testing method by WASSCE, and the study assessed the perceived usefulness of stakeholders.

Despite the growing global shift toward digitized assessment, the West African Examinations Council (WAEC) continues to rely predominantly on paper-based testing for the West Africa Senior School Certificate Examination (WASSCE). This reliance persists even as computer-based testing (CBT) has demonstrated potential to improve examination security, scoring efficiency, and test administration logistics. In Nigeria, and particularly in Ekiti State, the transition to CBT remains limited, with inconsistent policy direction, infrastructural constraints, and unequal access to digital resources in secondary schools. Stakeholder perceptions, including those of students, teachers, school administrators, parents, and examination officials, play a critical role in determining the feasibility and acceptance of CBT adoption. However, empirical evidence on these perceptions is sparse, fragmented, and insufficient to inform large-scale implementation. The absence of context-specific research creates a significant knowledge gap regarding the readiness of stakeholders, their concerns about equity and technological capacity, and the perceived implications for examination credibility. Consequently, policymakers and examination bodies lack the evidence necessary to design informed strategies for transitioning to CBT in Ekiti State's senior secondary school system. This gap underscores the urgent need for a systematic investigation into stakeholders' perceptions of CBT adoption for WASSCE in Ekiti State.

Therefore, this study investigates stakeholders' perceptions of the adoption of the computer-Based Test method by the West African Senior School Certificate Examination (WASSCE) in Oye-Ekiti. It seeks to understand the level of awareness, perceived benefits, challenges, and readiness of stakeholders toward embracing this technological advancement in educational assessment. The findings are expected to guide policy decisions, inform implementation strategies, and contribute to the broader discourse on digital transformation in Nigeria's educational evaluation system.

Research Questions

Evolving from the statement of the problem are the following research questions

1. What are the perceptions of stakeholders concerning the adoption of CBT for WASCE?
2. What is the stakeholders' level of acceptance of CBT for WASCE?
3. What are the perceived challenges in CBT for WASCE?
4. What are the perceived benefits of CBT for WASCE?

Research Hypothesis

H1: There is no significant difference in the perception of CBT adoption among stakeholders (students, teachers, policymakers).

Methodology

A descriptive survey design was employed. The population comprised public and private secondary schools and SS3 students, teachers, and school proprietors in the study area. A total of 300 respondents were selected using a purposive sampling technique, to get 180 students (60%), 90 teachers (30%), and 30 school owners (10%). Data were collected using a validated instrument titled the Stakeholders' Perception of CBT Adoption Scale (SPCAS). The instrument (questionnaire) has two sections (A and B). Section A captured the demographic profiles of learners, such as gender, age, and class. Section B measured the study's interests and this was sub-divided into 4 sections which are; perception of stakeholders (5 items, on 3 Likert scale -positive, neutral and negative), the stakeholders' level of acceptance (5 items, on 3 Likert scale - high, moderate and low), perceived challenges in CBT (12 items on 2 scale -agree and disagree) and benefits of CBT (7 items placed on at agree and disagree). The items of the instrument were obtained from the extant literature; however, we further validated it by presenting the initial draft to experts in tests and measurement. They affirmed its face and construct validity. The reliability of the instrument was ascertained by pilot testing it on 25 stakeholders who were not part of the actual study. Thereafter, the Cronbach alpha index of the instrument yielded $\alpha = 0.87$. The data collected were analysed using descriptive statistics (Frequency and percentage). The decision rule was based on majority responses for each item; if the majority (50% and above) of the responses selected positive, the research question was considered positive, while inferential statistics (one- way analysis of variance - ANOVA), as the hypothesis was tested at a 0.05 level of significance.

Results

Research question 1: What are the perceptions of stakeholders concerning the adoption of CBT for WASCE?

Table 1: Percentage analysis of stakeholders' perception on adoption of CBT for WASCE

Stakeholders (n)	Positive (Frequency and %)	Neutral (Frequency and %)	Negative (Frequency and %)
Teachers (90)	15(16.7%)	29 (33%)	46 (50.3%)
Students (180)	82(45.8%)	56 (30%)	42 (23.2%)
School owners (30)	16 (53.3%)	8 (26.6%)	6 (20%)

Findings in Table 1 revealed that only 16.7% of teachers expressed a positive perception of CBT adoption, 33% were neutral, while 50.3% held negative perceptions. Also, only 23.2% of the students showed a negative perception, 45.8% reported a positive perception

of the adoption of CBT for WASCE, while 45.8% reported a positive perception. Finally, 53.3% of the school owners reported positive perception, while only 20% showed negative perception on the adoption of CBT for WASCE. By this, it implies that the majority of the teachers dislike the CBT mode for WASCE; this could be related to the fact that machines are replacing them in script marking and compilation of WASCE results. The students and school owners in the study area expressed a positive perception of CBT adoption.

Research question Two: What is the stakeholders' level of acceptance of CBT for WASCE?

Table 2: Stakeholders' level of acceptance of CBT for WASCE.

Stakeholder	High Freq (%)	Moderate Freq (%)	Low Freq (%)
Teachers (90)	15 (16.6%)	10 (11.1%)	65 (72.2%)
Students (180)	65 (36%)	55 (31%)	60 (33%)
School owners (30)	14 (46.3%)	4 (13.3%)	10 (33.3%)

From Table 2, the results revealed stakeholders' level of acceptance of CBT for WASCE. Among stakeholder groups, more teachers exhibited a low level of acceptance, with 72.2%, followed by students (36%) and school owners (33.3%), while the high level of acceptance was recorded at 16.6% from teachers, 36% from students, and 46.3% from school owners, respectively. This implies that students and school owners accept CBT for WASCE more than the teachers in the study area.

Research question 3: What are the perceived challenges in CBT for WASCE?

Table 3: Perceived Challenges in CBT for WASCE.

s/n	Statement	Agree Freq(%)	Disagree Freq(%)
a	Infrastructure limitations: insufficient ICT facilities like computers, laptops, and furniture.	235(79)	65(11)
b	Technical issues:		
	Network problems	203(67)	97(32)
	Complexity of CBT software	201(64)	99(36)
	Hacking risks	216(70)	84(30)
	System malfunctioning	223(74)	77(26)
	Poor technical support	225(73)	75(27)
c	Power supply challenges: unreliable electricity supply	247(83.9)	53(16.1)
d	Computer illiteracy: Students and teachers have limited ICT (digital) literacy for CBT	211(71)	89(29)
e	Fund: Lack of funds for ICT resources and infrastructure development	157(52)	143(48)

F	Accessibility concerns: Challenges for visually impaired or physically handicapped students	92((32)	208(68)
g	Adaptation reluctance: Stakeholder resistance to transitioning from paper-based tests	134(45)	166(75)

From Table 3, results revealed major concerns included unreliable electricity supply (83.9%), insufficient ICT facilities (79.4%), system malfunctioning (74%), and students' and teachers' limited ICT (digital) literacy for CBT (71%). This implies that there are notable challenges in the adoption of CBT for WASCE.

Research question 4: What are the perceived benefits of CBT for WASCE?

Table 4: Perceived Benefits in CBT for WASCE.

s/n	Statement	Agree Freq (%)	Disagree Freq(%)
1	Efficiency in result processing	105(35)	195(65)
2	Reduction in examination irregularities	75(25)	227(75)
3	improved examination integrity	221(74)	79(26.3)
4	Faster result processes	232(85)	68(15)
5	Reduce labour	204(45)	96(75)
6	Reduce human error	159(53)	141(47)
7	Reduce examination malpractice	216(72)	84(28)

Table 4 shows the perceived benefits in CBT for WASCE. According to the respondents, Faster result processing (85%), improved examination integrity 74%), reduced examination malpractice (72%), and reduced human error (53%) are the perceived benefits of adoption of CBT for WASEC in the study area.

Research Hypothesis

H1: There is no significant difference in the perception of CBT adoption among stakeholders (students, teachers, policymakers) for WASEC.

Table 5: One-way analysis of Variance of the perception of CBT adoption among stakeholders

	SS	MS	df	F	Sig
Between Groups	10.021	.011	2	5.16	0.11
Within Groups	45.546	.245	298		
Total	55.568		300		

***P > 0.05**

Results in Table 5 showed a one-way analysis of variance (ANOVA) with no significant difference in perception among stakeholder groups, with $F = 5.16$, p of $0.11 > .05$. By this, it implies that the null hypothesis is rejected, which means that there is a significant difference in the perception of stakeholders on the adoption of CBT for WASCE in the study area. By this, the post hoc analysis was applied.

Table 6: Scheffe Post Hoc Tests perception of stakeholders on the adoption of CBT for WASCE

Stakeholders	Teachers	Students	School owners
Teachers (Group 1)			
Students Group 2)	0.231		
School owners (Group 3)	0.023*	0.562	

*. significant at < 0.05 level.

To find out which pairs of indices are significant, the Scheffe post Hoc test was carried out, and the results showed the differences between:

Teachers and students ($p = 0.231$) are not statistically significant.

Teachers and school owners ($p = 0.023$) are statistically significant.

Students and school owners ($p = 0.562$) are not statistically significant. In summary, the post hoc comparison was significant between group 1 and group 3 (0.023) using Scheffe.

Discussion

Perception of stakeholders on the adoption of CBT for WASCE

Findings indicate that among the stakeholders, the teachers showed a negative perception of the adoption of CBT, while the students and school owners have a positive perception. The study believes that the extent to which the teachers' perception is negative could differ from one context to another; for example, many teachers are involved in the marking of WASEC theory script, for which they are paid; in this case, these teachers will see the CBT method as computers replacing them and stopping them from generating those funds. While students are, school owners may be viewing the other advantages in the CBT method. These findings have been supported by previous research (Adu-Gyamfi, 2018; Jamil, 2012; Adeyanju & Adeshina, 2024)

Stakeholders' level of acceptance of CBT for WASCE.

From the result it indicated that students and school owners accept CBT for WASCE more than the teachers in the study area, who reported high levels of acceptance, while the teachers reported low levels of acceptance. This result shows a strong relationship with the stakeholders' perception result. Since the perception is positive, the level of acceptance is high, and negative when the level of acceptance is low. The results are in line with reviewed studies from Oyelekan et al. (2019) and Adu-Gyamfi (2018).

Perceived Challenges in CBT for WASCE.

Findings on perceived challenges of CBT revealed major concerns, including unreliable electricity supply, insufficient ICT facilities, system malfunctioning, and teachers' limited ICT (digital) literacy for CBT. This implies that there are notable challenges in the adoption of CBT for WASCE. This implies that educational assessment in the study area is still lagging because of these problems and more that can directly or indirectly affect the examination processes. The report supports the studies of the following researchers, as revealed in this study: Oyelekan et al. (2019), Adu-Gyamfi (2018), and Jamil (2012). Muhammad & Hayyo (2023), Okoli, Ubangha & Egberongbe (2022).

Perceived Benefits in CBT for WASCE.

Findings show the perceived benefits of CBT for WASCE, which include faster result processing, improved examination integrity, reduced examination malpractice, and reduced human error, as the perceived benefits of adoption of CBT for WASCE in the study area. This result supports the study of Oyelekan (2019). Adu-Gyamfi (2018). Jamil (2012) revealed in this study.

Conclusion and Recommendations

The study explored the perception of stakeholders (teachers, students, and school owners) on adopting CBT for West Africa Senior Secondary School certification in Ekiti State. The perception of teachers showed a negative perception, while students and school owners indicated a positive perception. Also, it aligns with the levels of acceptance of CBT, and it indicates that teachers had a low level of acceptance, while the other stakeholders in the study have a high acceptance level. The perceived problems were many, such as unreliable electricity supply, insufficient ICT facilities, and system malfunctioning; students and teachers had limited ICT (digital) literacy for CBT. This implies that there are notable challenges in the adoption of CBT for WASCE. In contrast, perceived benefits such as improved examination integrity and faster result processing, to mention but a few, were considered reported. Finally, the adoption of CBT for WASCE requires stakeholder engagement, infrastructure development, and capacity building to maximize benefits and mitigate challenges.

Based on the findings of the study, the following were recommended,

2. Teachers and students should receive regular CBT training workshops.
3. Reliable power and internet supply should be prioritized before full-scale adoption.
4. Pilot Testing: Conduct CBT trials to address operational issues pre-examination.

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