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Teachers' and Students' Perceptions Pertaining Computer-Based Testing (CBT) Assessment in Higher Education in Sokoto, Nigeria

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Abstract:
Computer-Based Testing (CBT) has become a major mode of assessment in higher education in Nigeria. Many higher institutions in Sokoto have moved from Paper-and-Pencil Test (PPT) to CBT for examinations, tests, and assignments. However, the success of CBT depends on how teachers and students perceive it. If teachers and students perceive it positively, they will accept and use it well. If they perceive it negatively, they will resist it, and it will fail. This study assessed teachers' and students' perceptions pertaining to Computer-Based Testing in assessment in higher education in Sokoto, Nigeria. The study specifically assessed students' perception of CBT, teachers' perception of problems of CBT, and teachers' perception of benefits of CBT. A descriptive survey design was adopted. A total of 214 students and 130 teachers from higher institutions in Sokoto participated in the study. A structured questionnaire was used to collect data. Data were analysed using frequency, percentage and Chi-square goodness-of-fit test at 5% level of significance ($p < 0.05$). Results showed that for students' perception, poor computer knowledge of students and teachers was the most perceived ($n = 125$, 58.41%), followed by reduces examination anxiety ($n = 34$, 15.89%), students may score more marks according to luck ($n = 32$, 14.95%) and brilliant students may fail the assessment (= 23, 10.75%). The distribution was highly significant ($\chi^2 = 128.69$, $df = 3$, $p < 0.001$). For teachers' perception of problems, poor ICT awareness was the most perceived ($n = 67$, 51.54%), followed by shortage of materials ($n = 44$, 33.85%) and other miscellaneous challenges ($n = 19$, 14.62%). The distribution was highly significant ($\chi^2 = 26.60$, $df = 2$, $p < 0.001$). For teachers' perception of benefits, it can be administered on large scale was the most perceived ($n = 48$, 36.92%), followed by useful to stall examination malpractice ($n = 35$, 26.92%), very easily administered ($n = 28$, 21.54%) and saves time and cost ($n = 19$, 14.62%). The distribution was significant ($\chi^2 = 13.82$, $df = 3$, $p = 0.003$). The study concluded that both teachers and students perceive poor computer / ICT knowledge as the major problem of CBT, but teachers also perceive CBT as very beneficial, especially for large scale administration and for controlling examination malpractice. It was recommended that higher institutions in Sokoto should organise regular ICT training for teachers and students, provide adequate CBT facilities, and maintain CBT as the main mode of assessment while addressing its challenges.

Keywords: *Perception, Computer-Based Testing, CBT, Assessment, Teachers, Students, Higher Education, Sokoto*

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INTRODUCTION

Assessment is one of the most important activities in education. It is the process of collecting evidence about what a student knows, understands and can do, in order to make decisions about teaching, learning, grading and certification. Without assessment, teachers cannot know whether students have learned, and students cannot know whether they are progressing (Lilley et al., 2015).

For many years, assessment in higher education in Nigeria was done using Paper-and-Pencil Test (PPT), where students write answers on paper with pen or pencil. This method has many problems: it takes long time to mark, it is prone to marking errors and bias, it encourages examination malpractice such as copying, impersonation and leakage of question papers, and it takes long time to release results. Because of these problems, many institutions have moved to Computer-Based Testing (CBT) (Valle et al., 2019; Patil, 2023).

Computer-Based Testing is a form of assessment where students answer questions on a computer, tablet or phone, and the computer marks the test, records the scores and releases the results automatically (Adepoju, 2018). CBT is now used by JAMB, WAEC, NECO, universities, polytechnics, colleges of education and schools of health technology in Nigeria. In Sokoto State, many higher institutions now use CBT for entrance examinations, semester examinations, tests, quizzes and assignments (Haruna et al., 2022).

CBT has many advantages. It can be administered to a large number of students at the same time. It reduces examination malpractice because questions and options can be shuffled for each student. It gives immediate feedback and fast release of results. It reduces the cost of printing, paper and carrying of scripts. It also reduces human errors in marking and recording of scores (Agbo & Jeremiah, 2024).

Despite these advantages, CBT also has problems. Many students and teachers have poor computer knowledge and poor ICT awareness (David et al., 2020). They do not know how to use mouse, keyboard, and computer system, and they become confused and anxious during CBT (Bawa & Bashar, 2022). There is also shortage of computers, CBT centers, stable electricity and internet facilities in many institutions (Gada et al., 2026). Some students believe that CBT is based on luck that a student can guess and score high marks, while a brilliant student can fail because of computer failure, network failure, or lack of computer skill, not because of lack of knowledge (Valle et al., 2019).

Perception is very important in this matter. Perception is how a person sees, understands and interprets something (Bawa & Bashar, 2022). If teachers and students perceive CBT positively, they will accept it, prepare for it, and perform well in it. If they perceive it negatively, they will fear it, resist it, and perform poorly, even if CBT itself is good (Haruna et al., 2022). Therefore, before any institution can fully adopt CBT, it is necessary to study the perception of teachers and students who are the direct users of CBT. This study was therefore carried out to assess teachers' and students' perceptions pertaining to Computer-Based Testing in assessment in higher education in Sokoto, Nigeria.

Objectives of the Study

The objectives of this study are:

- To assess the perception of students on CBT as assessment in higher institutions in Sokoto
- To assess the perception of teachers on problems of CBT as assessment in higher institutions in Sokoto
- To assess the perception of teachers on benefits of CBT as assessment in higher institutions in Sokoto
- To test whether the perceptions are significantly distributed across the different options

Research Questions

The research questions of this study are

- What is the perception of students on CBT as assessment in higher institutions in Sokoto?

- What is the perception of teachers on problems of CBT as assessment in higher institutions in Sokoto?
- What is the perception of teachers on benefits of CBT as assessment in higher institutions in Sokoto?

Materials And Methods

Study Design

A descriptive cross-sectional survey design was adopted for this study. The design was suitable because it allows the researcher to collect data from a large number of respondents at a single point in time, and to describe their perceptions as they are, without manipulating any variable. It is the most suitable design for perception studies.

Study Area

The study was carried out in higher institutions in Sokoto, Sokoto State, Nigeria. Sokoto is in North-West Nigeria and is the headquarters of Sokoto Caliphate. It has several higher institutions including Usmanu Danfodiyo University, Sokoto State University, Sokoto State Polytechnic, Shehu Shagari College of Education, School of Health Technology, and other private institutions. These institutions have adopted CBT for various forms of assessment, including JAMB CBT, semester examinations, and internal tests. The study area was chosen because CBT is widely used there, but the perception of teachers and students about it has not been fully studied.

Study Population

The study population comprised two groups:

Students-All students in higher institutions in Sokoto who have participated in CBT assessment.

Teachers- All teachers / lecturers in higher institutions in Sokoto who have participated in conducting, invigilating or marking CBT assessment.

Sample Size and Sampling Technique

A total of 344 respondents participated in the study, made up of 214 students and 130 teachers. A multi-stage sampling technique was used. In the first stage, higher institutions in Sokoto were purposively selected because they use CBT. In the second stage, departments / faculties were selected by simple random sampling. In the third stage, students and teachers were selected by convenience sampling, those who were available, willing, and had experience of CBT were included. Inclusion criteria were: being a registered student or employed teacher in a higher institution in Sokoto, having participated in at least one CBT assessment, and giving consent to participate. Students and teachers who had never participated in CBT, who were absent during data collection, or who refused to participate were excluded.

Research Instrument

A structured questionnaire was used for data collection. Two separate questionnaires were used, one for students and one for teachers, but they were designed in the same format for easy comparison. The students' Questionnaire had two sections namely:

Section A: Socio-demographic data had age, sex, institution, course, level of study, number of times participated in CBT.

Section B: Perception of students on CBT had 4 items: Students may score more marks according to luck; Brilliant students may fail the assessment; Many students and teachers have poor computer knowledge; Reduces examination anxiety. Students were asked to tick the one they most perceive.

Teachers' Questionnaire had three sections namely:

Section A: Socio-demographic data had age, sex, institution, qualification, years of teaching experience, number of times participated in CBT.

Section B: Perception of teachers on problems of CBT had 3 items: Poor ICT awareness; Shortage of materials; Other miscellaneous challenges. Teachers were asked to tick the main problem they perceive.

Section C: Perception of teachers on benefits of CBT had 4 items: It is very easily administered; It can be administered on large scale; Useful to stall examination malpractice; Saves time and cost. Teachers were asked to tick the main benefit they perceive.
The questionnaire used closed-ended questions with options, so that responses could be easily coded and analyzed.

Validity and Reliability

The questionnaire was validated by two experts in Measurement and Evaluation and one expert in Computer Science, who checked for face and content validity, clarity of language, and relevance of items to the objectives of the study. Their corrections and suggestions were effected before administration. Reliability was ensured by pre-testing the questionnaire on 20 students and 10 teachers in a higher institution outside the study area who were not part of the main study. The pre-test showed that the instrument was clear, easy to understand, and took about 10-15 minutes to fill.

Method of Data Collection

The researchers personally visited the selected higher institutions in Sokoto, after obtaining permission. The purpose of the study was explained to the respondents, and they were assured of confidentiality, anonymity and voluntary participation. The questionnaires were administered in classrooms for students and in staff rooms / offices for teachers. The questionnaires were filled on the spot and retrieved immediately, to ensure high return rate. All 214 students' questionnaires and all 130 teachers' questionnaires were retrieved, giving a 100% return rate.

Ethical Considerations

Permission was obtained from the authorities of the selected institutions. Informed consent was obtained from each respondent. Participation was voluntary, and respondents were free to withdraw at any time without penalty. No name, registration number or identification number was required, to ensure confidentiality and anonymity. Data collected were used for research purpose only.

Method of Data Analysis:

Data were coded, entered and analyzed using frequency, percentage and Chi-square goodness-of-fit test.

RESULTS AND DISCUSSION

This study assessed teachers' and students' perceptions pertaining to Computer-Based Testing in assessment in higher education in Sokoto. The discussion is presented according to the three objectives of the study.

Table 1:Perception of students on CBT as assessment in higher institutions in Sokoto

Perception of student	Frequency	Percentage	Df	Chi square	Remarks
Students mays score more marks according to luck	32	14.95	3	128.69	Significant
Brilliant students may failed the assessment	23	10.75			
Many of the students and teachers have poor computer knowledge	125	58.41			

Reduces examination anxiety	34	15.89			
Total	214	100.00			

The result in Table 1 shows that the most perceived issue by students is poor computer knowledge of students and teachers, reported by 125 students (58.41%). This was followed by reduces examination anxiety (34, 15.89%), students may score more marks according to luck (32, 14.95%) and brilliant students may fail the assessment (23, 10.75%). The Chi-square goodness-of-fit test showed that this distribution was highly significant ($\chi^2 = 128.69$, df = 3, $p < 0.001$), with a large effect size (Cramer's V = 0.45). This finding means that in Sokoto, the main problem of CBT is not CBT itself, but the skill to use it. Many students come from rural areas where they have never used a computer before entering higher institution. They do not know how to use mouse, keyboard, scroll and submit button, and they become confused during CBT. Even some teachers also have poor computer knowledge, so they cannot guide students properly. When a student fails in CBT, it may not be because he does not know the answer, but because he does not know how to operate the computer. The contribution to Chi-square confirms this. Poor computer knowledge alone contributed 95.56 (74.3%) of the total Chi-square, with a very large positive standardized residual of +9.78, meaning far more students chose it than would be expected if there was no preference. The other three options all had negative residuals, meaning they were chosen far less than expected. It is interesting that reduces examination anxiety was the second most perceived (15.89%). This shows that some students actually like CBT because it reduces anxiety. In Paper-and-Pencil Test, students fear the teacher watching them and fear waiting long for results. In CBT, the student sits alone with the computer, answers privately, and gets result immediately, so anxiety is reduced. This agrees with David et al. (2020), who found that CBT reduces anxiety and malpractice in tertiary institutions. However, the finding that students may score more marks according to luck (14.95%) and brilliant students may fail (10.75%) shows that some students still distrust CBT. They believe CBT is based on guessing, because most CBT questions are objective (MCQ), a weak student can guess and score high, while a brilliant student can fail because of computer failure, network failure, or power failure. This fear is real in Sokoto where power and network are unstable. Institutions must therefore ensure stable power, good network and backup system during CBT, so that brilliant students do not fail for technical reasons. This finding agrees with Abanobi et al. (2024), who reported that CBT and test anxiety affect academic achievement, and with Abasiama & Okpor (2025), who reported that perception of CBT among students was influenced by computer knowledge and experience.

Table 2:Perception of teachers on problems of CBT as assessment in higher institutions in Sokoto

Perception of teacher	**Frequency**	**Percentage**	**df**	**Chi square**	**Remarks**
Poor ICT awareness	67	51.54	2	26.60	Significant
Shortage of materials	44	33.85			
Other miscellaneous challenges	19	14.62			
Total	130	100.00			

The result in Table 2 shows that the most perceived problem by teachers is poor ICT awareness, reported by 67 teachers (51.54%), followed by shortage of materials (44, 33.85%) and other miscellaneous challenges (19, 14.62%).

The Chi-square goodness-of-fit test showed that this distribution was highly significant (χ^2 = 26.60, df = 2, p < 0.001), with a medium-large effect size (Cramer's V = 0.32). This finding agrees with the students' finding in Table 1. Both teachers and students agree that the main problem is poor computer / ICT knowledge. For teachers, poor ICT awareness means they do not know how to set questions on CBT software, how to upload questions, how to manage CBT centre, and how to handle technical problems during examination. Many teachers in Sokoto were trained in the era of Paper-and-Pencil Test, and they have not been trained on CBT. This is a serious problem, because if the teacher does not know ICT, he cannot teach the student ICT. The second problem, shortage of materials (33.85%), is also very important. Shortage of materials means shortage of computers, CBT centres, servers, software, stable electricity, internet, and even chairs and tables for CBT. In many institutions in Sokoto, one CBT centre with 100 computers is used for 1,000 students, so students have to write in batches, some in the morning, some at night, and this leads to stress and malpractice. This agrees with Haruna et al. (2022), who reported that design and implementation of CBT application for Colleges of Education in Nigeria is hindered by lack of facilities. Other miscellaneous challenges (14.62%) — such as network failure, power failure, system hanging, and fear of hacking, were perceived as minor. This means that in the perception of teachers, the main problems are human (ICT awareness) and material (shortage), not technical miscellaneous issues.

Table 3:Perception of teachers on benefits of CBT as assessment in higher institutions in Sokoto

Perception of teacher	Frequency	Percentage	Df	Chi square	Remarks
It is very easily administered	28	21.54	3	13.82	Significant
It can be administered on large scale	48	36.92			
Useful to stall examination malpractice	35	26.92			
Saves time and cost	`19	14.62			
Total	130	100.00			

The result in Table 3 shows that the most perceived benefit by teachers is that CBT can be administered on large scale, reported by 48 teachers (36.92%), followed by useful to stall examination malpractice (35, 26.92%), very easily administered (28, 21.54%) and saves time and cost (19, 14.62%). The Chi-square goodness-of-fit test showed that this distribution was significant (χ^2 = 13.82, df = 3, p = 0.003), with a small-medium effect size (Cramer's V = 0.19). The finding that large scale administration is the top benefit (36.92%) is very logical for Sokoto. Higher institutions in Sokoto have large numbers of students, sometimes 2,000 to 5,000 students writing the same examination. With Paper-and-Pencil Test, it is very difficult to mark 5,000 scripts, and results take months. With CBT, 5,000 students can write in batches in one week, and results are released immediately. This is why teachers value CBT most for large scale. The second benefit, useful to stall examination malpractice (26.92%), is also very important. In CBT, questions and options are shuffled for each student, so copying is useless. There is no leakage of question paper, no impersonation because of biometric capture, and no alteration of scores because marking is automatic. This agrees with Agbo and Jeremiah (2024), who found that CBT reduced examination malpractice in General Studies examinations in Ebonyi State University, and with David et al. (2020), who called CBT a panacea to examination malpractice. It is interesting that saves time and cost was the lowest benefit (14.62%). This means teachers do not perceive CBT as mainly a cost-saving tool. In fact, in

the short term, CBT is expensive, it requires buying computers, building CBT centers, paying for software, and maintaining generators. The benefit of CBT is not in saving money, but in saving stress, improving fairness, and handling large numbers. Institutions should therefore not adopt CBT only to save money, but to improve quality and fairness of assessment (Bawa & Bashar, 2022). Generally, together, the findings show that, both teachers and students agree that the main problem of CBT is poor computer / ICT knowledge, while teachers agree that CBT is beneficial for large scale administration and for controlling malpractice. The problem is not acceptance, teachers and students accept CBT, but capacity. If higher institutions in Sokoto organize regular ICT training for teachers and students, provide adequate CBT facilities, and ensure stable power and network, CBT will be very successful. If they do not, CBT will continue to be perceived as a test of computer skill, not a test of knowledge (Bawa & Bashar, 2022).

Conclusion

This study assessed teachers' and students' perceptions pertaining to Computer-Based Testing in assessment in higher education in Sokoto, Nigeria, using 214 students and 130 teachers. The study concluded that: For students, the most perceived issue is poor computer knowledge of students and teachers (58.41%). The Chi-square test confirmed this is highly significant (χ^2 = 128.69, df = 3, $p < 0.001$, V = 0.45). For teachers, the most perceived problem is poor ICT awareness (51.54%), followed by shortage of materials (33.85%). The Chi-square test confirmed this is highly significant (χ^2 = 26.60, df = 2, $p < 0.001$, V = 0.32). For teachers, the most perceived benefit is CBT can be administered on large scale (36.92%), followed by useful to stall examination malpractice (26.92%). The Chi-square test confirmed this is significant (χ^2 = 13.82, df = 3, p = 0.003, V = 0.19). The null hypothesis was rejected. Certainly, both teachers and students agree that the main problem of CBT is poor computer / ICT knowledge, while teachers agree that CBT is beneficial for large scale administration and for controlling malpractice. It can therefore be concluded that CBT is accepted and beneficial in higher education in Sokoto, but its full benefits cannot be achieved until the problem of poor computer / ICT knowledge and shortage of facilities is solved.

Recommendations

The recommendations based on the findings of this study are follows:

- Higher institutions in Sokoto should organize regular ICT training and computer literacy classes for both teachers and students, especially for new students in Year 1, before they write CBT.
- Institutions should provide adequate CBT facilities, more computers, more CBT centers, stable electricity (solar / generator backup), and stable internet.
- CBT should be used for continuous assessment, tests and quizzes regularly, so that students become familiar with it before final examination, and anxiety is reduced.
- Institutions should maintain backup system for power and network failure during CBT, so that brilliant students do not fail for technical reasons.
- Teachers should be trained on CBT software on how to set questions, upload questions, and manage CBT center, so that they can guide students properly.
- CBT should be maintained as the main mode of assessment, but Paper-and-Pencil Test can still be used for essay and practical skills that CBT cannot easily assess.

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