Perception and Attitude of Pre-Tertiary Institution Students towards Computer Based Test in Southwestern Nigeria

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Abstract

Assessment is a pivotal part of the educational system and Computer Based Testing (CBT) is permeating the process of academic assessment globally. This study investigated the perception and attitude of pre-tertiary institution students towards CBT and the influence of gender and location on the perception and attitude of the students. The study adopted a descriptive survey research design and data was collected from 599 Unified Tertiary Matriculation Examination (UTME) candidates in 3 states in southwestern Nigeria, using a multistage sampling technique. In carrying out this study, a questionnaire titled "Student's Attitude and Perception Questionnaire (SAPQ)" was used to gather information from the respondents. Data collected were analysed using appropriate descriptive and inferential statistics including descriptive tables, Chi-Square test and independent samples t-test. Findings of this study indicated that students possess a positive perception (57.9%) towards CBT in terms of ease of use, perceived usefulness and credibility. Similarly, students showed a positive attitude (57.9%) towards CBT. Also, the study revealed that there is a significant difference in the perception and attitude of students towards the use of CBT based on location and gender. Based on the findings of the study, it is recommended that the government, examination bodies and educational institutions should promote the use of CBT for examinations by implementing policies, educating students on CBT usage, and focusing on rural students to increase their knowledge and adoption of these technologies.

Keywords: *Perception, Attitude, Computer-based Test (CBT), Assessment, Gender*

Introduction

Assessment in the field of education involves the evaluation of knowledge and competence of learners in selected or all aspects of a subject area. In Nigeria, these assessments usually take the form of tests, questionnaires, rating scales and examinations, usually structured to cover an academic semester/session's syllabus (Akbar, Pasiga, Samad, Pratiwi, & Irmadani, 2022; Ndume, Dasuki, & Ogedebe, 2014). According to Tomori and Tomori (2019), a test can be described as a series of standardised questions that require an individual or group of individuals to answer. The series of questions are designed to assess the extent of knowledge or expertise that the testee(s) possesses. With the advent of Information Communication Technology (ICT), and its integration into the Nigerian educational system, assessments especially, testing have undergone necessary reformations, evident in the increase in the popularity and acceptance of Computer Based Test among examination bodies, government parastatals, business organisations and educational institutions.

According to Gaytan and McEwen (2009), Computer Based Test (CBT) can be described as a system of evaluation designed for assessing students' academic achievement in an electronic environment. A CBT utilises a computer/computerised system in question delivery, pre-defined answer storage, response marking and result display (Whittington, Bull, & Danson, 2000).

A predominant instance of the inculcation of CBT into assessments and testing in Nigeria is the Unified Tertiary Matriculation Examination (UTME), an annual examination organised and conducted by the Joint Admission and Matriculation Board (JAMB). The Unified Tertiary Matriculation Examination is a standardised assessment usually taken by aspiring undergraduates (Nkwocha, Akanwa, & Nkwocha, 2015). Before the complete adoption of the CBT mode of examination by JAMB in 2015, it operated the traditional Paper and Pencil Test (PPT), which basically involved the use of non-electronic means (usually paper) in the conduct of its annual pre-varsity examination.

However, in 2013 and 2014, JAMB adopted 3 modes of assessment, that is, the PPT, CBT and dual-based test which is a combination of the PPT and CBT modes. Since the adoption of the CBT mode of examination, several studies have been carried out to evaluate its impact, acceptability and credibility in the conduct of the Unified Tertiary Matriculation Examination (Agbo & Bekorfema, 2022; Abanobi, 2022; Bawa & Bashar, 2022).

The CBT mode of assessment is often preferred over the Paper-based test by students and instructors alike because of its features which include effective time management, flexibility, real-time feedback mechanism, ease of use reliability and credibility (Olafare, Yebola, Christopher& Annenne, 2017; Nugroho, Kusumawati & Ambarwati, 2017). These features can also be considered as the advantages that the CBT mode of assessment lends to institutions and students that use the mode for conducting tests and examinations (Soto-Rodríguez, Fernández-Vilas, & Díaz-Redondo, 2021). However, in spite of the numerous advantages of CBT, the mode of testing is challenged by errors that occur when handling a response input device, inconsistency between the stored answers and the accurate answer, the cost of development, implementation and maintenance among others (Abanobi ,2022; Bawa & Bashar, 2022).

Every year in Nigeria, secondary school leavers write the Unified Tertiary Matriculation Examination (UTME), a computer-based examination designed for admitting students into tertiary institutions. Students are required to meet a certain benchmark score before they can be considered for admission into the tertiary institutions, and in some cases, the tertiary institutions further submit the students to a computer-based assessment called "POST-UTME" to further eliminate underachieving students. Several studies have investigated the perception and attitude of students towards the use of the computer-based test for their examinations and tests, with major focus on undergraduate students (Agbo & Berkofoma, 2022; Okocha 2022; Nughoro et al., 2018). Several other studies have investigated the perception of parents and teachers towards the use of CBT mode of assessment for the conduct of examination.

However, there is a gap in literature on the perception and attitude of students on the use of CBT for the conduct of the Unified Tertiary Matriculation Examination (UTME) with a focus on prospective undergraduates (secondary school leavers) in southwestern states of Nigeria. This study is carried out to fill this gap and also examine the effect of gender and location on the perception and attitude of prospective undergraduates to the CBT mode of assessment for UTME.

This study aimed at investigating the perception and attitude of prospective undergraduates in Southwestern states of Nigeria to the use of CBT for the Unified Tertiary Matriculation Examination. Specifically, the study investigated:

1. students' attitude to Computer Based Test;
2. students' perception of Computer Based Test;
3. the difference in students' perception and attitude to Computer Based Test based on their gender;

4. the difference in students' perception and attitude to Computer Based Test based on their location;

In achieving research objectives, this study asks the question: What is the perception and attitude of students towards Computer Based Test?

The following hypotheses were tested in this study:

H_{01}: There is no significant difference in students' perception of Computer Based Test based on gender

H_{02}: There is no significant difference in students' attitude towards Computer Based Test based on gender

H_{03}: There is no significant difference in students' perception of Computer Based Test based on location

H_{04}: There is no significant difference in students' attitude towards Computer Based Test based on location

REVIEW OF RELATED LITERATURE

Perception, as explained by Osegbuo and Ifeakor (2005), is the construction of one's understanding of the world from sensory information. Perception is generated from one's understanding of experience gathered through interactions with the immediate environment. Slameto (2015) view perception as the transfer of information from the surrounding environment into the brain; the information supplied to the brain helps the individual make sense of the stimuli being received from the environment. Hence, students' perception of CBT can be described as their understanding of what CBT is and how to interact with it.

In the same vein, according to Agbo and Bekorfema (2022), Attitude, is a behaviour-influencing internal psychological state. It can be described as a sentiment or idiosyncrasy about someone or a subject that is developed from experience, usually affected by intrinsic and extrinsic factors. Abubakar (2015) further explains that attitudes can be classified broadly into two: implicit and explicit attitudes. Implicit attitude are intrinsic behaviours that are stored in the subconscious while explicit attitudes are usually developed through experience and interactions with the environment. Therefore, students' attitude towards CBT can be explained as their opinion and behaviour towards the use of CBT. Several studies have investigated the perception and attitude of students towards computer-based tests (Okocha, 2022; Olafare, Yebola, Christopher, & Annenne, 2017; Tella & Bashorun, 2012), however, the concepts have only been examined independently.

For instance, Okocha (2022) examined the perception of undergraduate students towards computer-based testing; a close-ended questionnaire was utilised in collecting data from 250 randomly selected respondents. The results of the study showed that a larger percentage of students preferred CBT to PPT but lacked willingness in adopting the method for all examinations. In a study conducted by Bawa and Bashar (2022), students' perceptions of the use of CBT for the conduct of General Studies examinations in Usmanu Danfodiyo University, Sokoto, was examined. The study was designed as a descriptive survey and data was collected using a researcher-structured questionnaire, the findings of the study showed that the students possess positive perception of the CBT examinations.

Also, Akbar, et al. (2022) investigated students' perceptions regarding computer-based test (CBT) hosted on the SIKOLA learning platform during the COVID-19 pandemic. The study was designed as a cross-sectional study and data collected using an online questionnaire. The findings of the study showed that there was a significant difference between pre-clinical and clinical students in their perceptions of CBT based on its pedagogy, validity, reliability, reliability, affective factors, efficiency and safety ($p<0.005$).

In 2012, Tella and Bashorun, investigated the attitude of undergraduate students towards computer-based test in university of Ilorin. Data was collected from a sample size of 2209 undergraduates, using Computer Based Test Attitudinal Survey (CBTAS) and focus group discussion. The findings of the study revealed that students have a

positive attitude towards computer-based tests. Also, students showed a strong positive attitude towards the use of technology within an educational setting. The study also identified challenges to the use of computer-based test for examination, that is, shortage of computer systems, slow network, problematic font sizes, and lack of digital skills.

Bandele and Olatunji (2019) examined the attitude of students to general studies computer-based tests in Universities in South West Nigeria. The research was designed as a descriptive survey research and data was collected from undergraduates using a test and questionnaire. The study revealed that students possess a positive attitude towards the use of Computer Based Test method for general studies examination. Agbo & Bekorfema (2022), examined the influence of age and gender on students' attitude towards computer-based testing. The study adopted the descriptive survey research design and data was collected using an Attitudinal Scale of Candidate on the use of Computer Based Test (ASCCBT), the findings of the research showed that there is a significant influence of gender on student's attitude towards Computer Based Testing, however, there is no significant influence of age on students' attitude towards CBT. The study revealed that male students possess a higher degree of positive attitude towards CBT when compared to their female counterparts.

Literatures reviewed revealed that there is positive perception and attitude towards the usage of Computer Based Test (CBT) method of assessment in the conduct of examinations. However, the perception and attitude of students towards CBT were examined independently, also majority of the literatures focused on university undergraduates' perception and attitude towards CBT.

METHODOLOGY

The study adopted the descriptive survey research design. The usage of descriptive survey design was chosen since this research design will be ideal for establishing the generalisability of findings. The population for the study consisted of all 572,118 candidates that registered for the 2022 JAMB CBT examination in Southwestern Nigeria. A total of 572,118 candidates registered for the examination in all the Southwestern States of Nigeria. In Ekiti State, 23, 224 candidates registered; 257,887 in Lagos State; 95,965 in Ogun State; 48,449 in Ondo State; 47,759 in Osun and 98,834 in Oyo State. A sample of 599 UTME candidates was selected using multi-stage sampling technique. To adequately represent the total population, participants were selected at the state, senatorial and local government area level using the simple random sampling technique. Fifty students were selected using the simple random sampling technique from two CBT centres in the selected local governments.

In carrying out this study, a research instrument titled "Student's Attitude and Perception Questionnaire (SAPQ) was used to collect information from the candidates. The questionnaire was divided into three sections. Section A covered the demographic information of the respondents while sections B and C asked questions to evaluate respondents' attitude and perception to CBT respectively. A pilot study was conducted among 50 students from a JAMB/CBT centre that was not part of the targeted population of the study to ascertain the reliability and validity of the instrument. The instrument was found to be reliable because the reliability coefficients exceeded the acceptable 0.70 score ($\boldsymbol{\alpha} = 0.723$ and $\omega = 0.767$). A total of 600 copies of the questionnaire were separately administered. However, questionnaire with incomplete responses were discarded. A total of 599 copies of questionnaires fully responded to were utilised in the analysis. Data collected were analysed in relation to the research question and hypotheses of the study using appropriate descriptive tables and t-test analysis using the Statistical Package for Social Sciences (SPSS).

RESEARCH/FINDINGS

Table 1 showed the demographic characteristics of the respondents. It showed that female students (304 (50.7%) outnumbered their male counterpart (295 (49.3%). In terms of respondents from each state, Ondo State had 201(33.6%) respondents, Osun State had 200 (33.4%) respondents, and Oyo State had 198 (33.0%) respondents.

Variables		Frequency	Percent
Sex	Female	304	50.7
	Male	295	49.3
	Total	599	100
State	Ondo	201	33.6
	Osun	200	33.4
	Oyo	198	33.0
	Total	599	100

Research Question One: What is the attitude of students to Computer Based Test?

To answer this question, items which focused on the attitude of students to computer-based test was computed. The mean = 12.10, standard deviation = 2.10, minimum score = 5, and maximum score = 15 were analysed. However, minimum score through the mean less than 0.01 was grouped into negative (5 – 12.09) attitude while from the mean score through the maximum score was grouped into positive (12.10 - 15) attitude. The result is presented in table 2

Table 2.

Students Attitude Towards CBT

Level of Attitude	Frequency	Percent
Negative	252	42.1
Positive	347	57.9
Total	599	100

Table 2 shows students' attitude towards CBT. The result showed that majority of the respondents demonstrated positive attitude (57.9%) towards CBT while few of them showed negative attitude (42.1%).

Research Question Two: What perception do students have towards Computer Based Test?

To answer this question, items which focused on the perception of students to computer-based test were computed. The mean = 46.4, standard deviation = 5.18, minimum score = 18, and maximum score = 54 were analysed. However, minimum score through the mean less than 0.01 was grouped into low (18 – 46.3) perception while from the mean score through the maximum score was grouped into high (46.4 - 54) perception.

Table 3.

Perception of Students Towards CBT

Level of Attitude	Frequency	Percent
Low	252	42.1
High	347	57.9
Total	599	100

Results from table 3 showed that perception of students towards CBT was high (57.9%) while (42.1%) had low perception towards it. The result thereby concluded that there is high perception of students towards CBT.

Hypotheses Testing

H_{01}: There is no significant difference in students' perception of Computer Based Test based on gender.

To test this hypothesis, items measuring students' perception were analysed and tested against gender using t-test. The result is presented in Table 4.

Table 4.

Students' Perception of Computer Based Test Based on Gender

Perception	N	$\bar{x}$	SD	df	t	Sig.	P
Male	295	46.69	4.20				
Female	304	46.11	5.98	596	1.38	0.003	< 0.05

Table 4 showed the students' perception of CBT based on gender. It revealed that male participants had a $\bar{x}$ = 46.69 and SD = 4.203 while female participants had a $\bar{x}$ = 46.11 and SD = 5.98. It was also noticed that the male participants demonstrated a better mean perception than their female counterpart. Specifically, it was revealed that there was statistically significant difference (t = 1.38, df = 596, p < 0.05) between students' perception of CBT and gender of the participants. Therefore, the null hypothesis is rejected.

H_{02}: There is no significant difference in students' attitude towards Computer Based Test based on gender.

To test hypothesis two, items measuring the construct of attitude were computed and analysed using independent sample t-test. Result is presented in Table 5.

Table 5.

Students' Attitude of Computer Based Test Based on Gender

Perception	N	$\bar{x}$	SD	Df	T	Sig.
Male	295	12.30	1.93			
Female	304	11.90	2.24	596	2.34	0.02

Result presented in Table 5 revealed the students' attitude to CBT based on gender. It showed that male participants had a $\bar{x}$ = 12.30 and SD = 1.93 while female participants had a $\bar{x}$ = 11.90 and SD = 2.24. It was also noticed that the male participants demonstrated a better mean perception than their female counterpart. Statistically, the Table 5 demonstrated that there was a significant difference (t = 2.34, df = 596, p = 0.02) between students' attitude of CBT based on the gender of the participants. Hence, the null hypothesis is rejected.

H_{03}: There is no significant difference in students' perception of Computer Based Test based on location

Table 6 presented the students attitude of CBT based on location. It showed distribution of responses across the different locations sampled among the states. In terms of location, respondents from Osogbo showed negative attitude (64 (41.3%) towards CBT while 91 (58.7%) showed positive attitude towards CBT.

Table 6.

Students Attitude of CBT Based on Location

State	Location	Level of Attitude		Total	df	χ^2	P
		Negative	Positive				
Osun	Osogbo	64 (41.3%)	91 (58.7%)	155 (100.0%)			
	Olorunda	15 (32.6%)	31 (67.4%)	46 (100.0%)			
Oyo	Ido	83 (61.5%)	52 (38.5%)	135 (100.0%)	4	29.27	< 0.05
	Lagelu	22 (34.9%)	41 (65.1%)	63 (100.0%)			
Ondo	Akure	68 (34.0%)	132 (57.5%)	200 (100.0%)			
	Total	252 (42.1%)	347 (57.9%)	599 (100.0%)			

In Olorunda, 15 (32.6%) and 31 (67.4%) of the respondents revealed negative and positive attitude towards CBT respectively. Respondents in Ido showed 83 (61.5%) negative attitude and 52 (38.5%) positive attitudes towards CBT, while participants in Lagelu and Akure, it showed 22 (34.9%); 41 (65.1%) and 68 (34.0%); 132 (57.5%) of negative and positive attitude respectively towards CBT.

Overall, Table 6 revealed that 252 of the respondents had negative attitude while 347 had positive attitude to CBT. This means that majority (57.9%) of the participants had positive attitude toward CBT whereas few (42.1%) of them demonstrated negative attitude towards CBT. Statistically, Table 6 showed that significant difference existed in students' attitude ($\chi^2 = 29.27$, df = 4, p = 0.00) towards Computer Based Test based on location. Hence, the null hypothesis was rejected.

H_{04}: There is no significant difference in students' perception of Computer Based Test based on location

Table 7 presented the students perception of CBT based on location. It showed distribution responses across the different locations sampled within the states. In terms of location, respondents from Osogbo revealed 71 (45.8%) low perception towards CBT while 84 (54.2%) showed high perception towards CBT. In Olorunda, 16 (34.8%) and 30 (65.2%) of the respondents revealed low and high perception towards CBT. Respondents in Ido showed 76 (56.3%) low perception and 59 (43.7%) showed high perception towards CBT, while participants in Lagelu showed 32 (50.8%) for low perception and 31(49.2%) for high perception towards CBT. In Akure, 85 (42.5%) and 115 (57.5%) for low and high perception respectively towards CBT.

Table 7.

Students Perception of CBT based on Location

Location	Level of Perception		Total	df	χ^2	P
	Low	High				
Osogbo	71 (45.8%)	84 (54.2%)	155 (100.0%)			
Olorunda	16 (34.8%)	30 (65.2%)	46 (100.0%)			
Ido	76 (56.3%)	59 (43.7%)	135 (100.0%)	4	9.51	< 0.05
Lagelu	32 (50.8%)	31 (49.2%)	63 (100.0%)			
Akure	85 (42.5%)	115 (57.5%)	200 (100.0%)			
Total	280 (46.7%)	319 (53.3%)	599 (100.0%)			

Statistically, Table 7 showed that significant difference existed in students' attitude ($\chi^2 = 9.51$, df = 4, p = 0.049) towards Computer Based Test based on location. Hence, the null hypothesis was rejected.

CONCLUSION

This study investigated the perception and attitude of pre-tertiary institution students towards Computer Based Test in the conduct of the Unified Tertiary Matriculation Examination. The findings of this research revealed that the students possess a positive perception (57.9%) towards CBT in terms of ease of use, perceived usefulness and credibility. This finding correlates with Olafare et al. (2017) where the perception of university students towards the use of CBT was investigated, the findings of the study showed that students possess a positive perception of CBT in terms of ease of use, credibility and perceived usefulness. Okocha (2022) also reported that university undergraduates show a positive perception towards CBT and majority of students prefer CBT to PPT for the conduct of their examinations.

Findings from this study also indicated that students displayed positive attitude (57.9%) towards CBT in UTME. This is in agreement with Tella and Bashorun (2012) who reported that university students generally possess a positive attitude towards the use of CBT in the conduct of university examinations. The result of this study also agrees with Agbo and Bekorfema (2022) who reported that undergraduate students possess a positive attitude towards the CBT mode of assessment. The study also indicated that there is a significant difference in the perception of students towards the use of CBT for UTME based on gender and location. This study equally agrees with the findings of Bebetos and Antonio (2008) which revealed that there is a significant difference in students' perception of CBT mode of assessment based on gender.

In terms of students' attitude towards CBT, the results of this study shows that there is a significant difference in students' attitude to CBT based on gender, this finding contradicts the findings of Agbo and Bekorfema (2022) which revealed that there is no significant influence of gender on prospective university candidates' attitude towards CBT.

In light of the foregoing, this study concludes that students possess a positive perception of CBT in terms of ease of use, perceived usefulness and credibility, and a positive attitude towards the use of CBT in UTME. The results indicated that students give credence to the CBT mode of assessment and it is acceptable for use because of its reliability, ease of use and efficiency. It equally indicated that location and gender significantly influenced the perception and attitude of pre-tertiary institutions students towards CBT.

RECOMMENDATIONS

Based on the findings of this study, the following are hereby recommended:

i. The government, examination bodies and educational institutions should increase the adoption of CBT for examinations by establishing policies that support its development and implementation across various educational institutions and examination bodies.
ii. Government should implement programmes that will educate students on the use of CBT in order to increase their attitude towards the use of CBT for student assessment.
iii. Government should pay special attention to students in rural locations in order to expose them to more educational technologies like CBT, to increase their knowledge of these technologies and its adoption across various location in the country.

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