Computer Anxiety and Computer Knowledge as Determinants of Candidates' Performance in Computer-based Test in Nigeria

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Authors' contributions

Both authors conceptualized the study. Author OAO designed the study, organized the literature. Author OJO performed the statistical analysis and managed the analysis of the study. Author OAO wrote the outline and Author OJO conducted the literature searches. Both authors wrote the first draft, read and approved the final manuscript.

ABSTRACT

Aims: To examine the influence of computer anxiety and computer knowledge on candidates' performance in Computer-Based Test.
Study Design: The study used descriptive survey and ex-post facto designs.
Place and Duration: Prospective candidates for 2013 Unified Tertiary Matriculation Examination in Nigeria and chose to write in CBT mode.
Methodology: Sample comprised 100 candidates (50 males and 50 females) in 2 purportedly chosen universities in Nigeria. A 20-item Computer Knowledge Test (CKT), a 20-item Computer Anxiety Scale (CAS) and a proforma to collect the UTME scores were used to collect data. Regression Analysis, ANOVA and t-test statistics were used to test hypotheses.
Results: Findings showed that computer knowledge and computer anxiety significantly combined to predict performance in CBT. They jointly accounted for 9.7 percent of the total variance in CBT performance (R^2 = 0.097, $F_{(2,99)}$ = 5.208, P<0.05). Computer knowledge is the only significant predictor of performance in CBT. It accounted for 29.2 percent of the total variance in CBT performance (t = 3.019, p<0.05).

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Conclusion: Computer knowledge and computer anxiety jointly influenced candidates' performance in CBT in Nigeria.
Recommendations: It is therefore recommended that Government should provide secondary schools in the country with adequate computers and internet facilities. CBT training centers should as a matter of urgency be set up to train candidates on CBT before their examinations.

1. INTRODUCTION

Information and Communication Technology (ICT) refers to a technology employed in the form of tools, equipment and application support which helps in the collection, storage, retrieval, use, transmission, manipulation and dissemination of information as accurately and effectively as possible for the purpose of enriching the knowledge and developing communication, decision making as well as problem solving ability of the user. ICT has now imparted positively in virtually all areas of human endeavor – Medicine, Education, Banking, Agriculture and Transportation. In the recent past, ICT was mainly used in Education for teaching and learning purposes. Recent developments in computer technologies have also influenced many areas including educational testing and assessment. One big change in the field of education and assessment under the influence of modern technology is the transition from paper-and-pencil based to computer-based assessment. Computer-Based Test (CBT) can be defined as tests or assessments that are administered by computers in either stand-alone or dedicated network, or by other technological devices linked to the internet or world-wide web, most of them using multiple choice questions (MCQ) [1]. CBT is now gaining popularity over the traditional Paper-and-Pencil Test (PPT) because of the numerous advantages that it can offer – such as immediate scoring and reporting of results; reduced costs of test production and administration. Furthermore, it is fair; it is accurate; it is more secured and it is one of the global best practices [2,3].

In the realization of the laudable benefits of CBT and to keep trends with international global best practices, CBT is now gaining trend in Nigeria. Some tertiary institutions have started using CBT to conduct their Post Unified Tertiary Matriculation Examination, while Joint Admission and Matriculation Board (JAMB) used it to conduct 2013 UTME, although it was made optional. The 2013 edition of UTME was unique as candidates were presented with three options – PPT, CBT and Dual-Based Test (DBT). Out of 1,735,720 candidates that applied for the UTME, 1,629,102 (93.86%) candidates applied for PPT, 15,008 (0.86%) chose DBT and 91,610 (5.28%) candidates applied for CBT [4]. The great disparity between the number of candidates that applied for PPT and CBT is a clear testimony that majority of the candidates shunned the CBT. Personal interaction with the candidates showed that fear of using computers (technophobia) and inadequate knowledge in using computers were reported by some of the candidates to shun CBT. They further stated that if they use CBT they might likely score lower than when they used PPT. The perceived reasons (factors) was initially noticed and classified into two by [5] as factors originating from "Users" and "Technology used". [5] stated that the user's gender, his/her ability to process information, ability to use a computer and his/her level of computer anxiety could have an influence on an application.

1.1 Literature Review

Many educators and researchers have shown interest in investigating the factors that influence students' performance in CBT. Literature is well documented on this. Some notable factors are students' gender, level of students' computer anxiety and level of students' computer knowledge.

1.2 Gender and Performance in CBT

The results of the effect of gender attribute on students' performance in CBT are not always consistent. Some studies indicated that gender was not related to performance difference between CBT and PPT [6,7]. Another separate study investigating the difference in performance between CBT and PPT in terms of gender, race and age, found no significant difference [8]. Whereas, in some other studies, gender was related to performance difference between CBT and PPT [5,9] with male examinees benefitting from CBT format more than female examinees who scored slightly lower in CBTs.

1.3 Computer Knowledge and Performance in CBT

The extent to which the test takers have knowledge or are familiar with computers have also been argued as a great predictor of performance in CBT. Computer knowledge or familiarity was widely examined as a factor that may influence students' performance in CBT. Although the results were not consistent. Some studies showed that computer knowledge was not associated with performance difference between CBT and PPT groups [6,8]. This shows that knowledge of computer has little or nothing to do with the performance of students in CBT [5]. On the other hand, other studies reported that students' computer knowledge was significantly related to performance in CBT [10-12]. Students with lower computer knowledge performed less in CBTs than students with moderate and adequate knowledge of the computer [13,3].

1.4 Computer Anxiety and Performance in CBT

Students' fear of computers or the tendency of the students to be uneasy, apprehensive and have phobia towards current or future use of computers in general is called computer anxiety of the students. As computers emerged into the mainstream in the 1980's, it became apparent that many users experience anxiety in using this new technological device. According to [14], an individual is considered computer anxious if the emotional state during interaction with computer reduces the benefits of the use of computers and discourages necessary use of computers. Computer anxiety obviously affects students' knowledge and performance in CBT. Some researchers have posited that inadequate knowledge of computer might increase the level of students' anxiety, which may invariably affect students' performance in CBT [as cited in 14]. Computer anxiety results from lack of examinees' experience in using computers and if they become more familiar with computer use, computer anxiety might be reduced. Tekinarslan E. [15] reported that there is no significant difference between male and female students' computer anxiety. Tekinarslan E. [15] further reported that as students' computer knowledge increases, computer anxiety level of student's decreases. Many studies have also established the link between computer anxiety and performance in CBT. Findings from these studies also seem inconclusive. Some studies reported that computer anxiety was not statistically significant for performance in CBT

[16,17]. Conversely, some studies reported that students who reported medium and high levels of computer anxiety perform worse than those with low levels in a CBT [18].

1.5 Gender Differences in Computer Anxiety and Computer Knowledge

The rise in technology has seen the emergence of a social issue called the "digital divide". The digital divide refers to individual or group inequalities in technological knowledge, accessibility, skill, self-efficacy and anxiety. These differences are often due to factors such as gender, age, race and socio-economic status [19,20] conducted a meta-analysis on the past 20 years of research studying gender differences and the digital divide. He found out that girls and women expressed greater anxiety and more negative attitudes toward computers than boys and men. According to [20], girls learn from an early age that computers are an educational medium designed with boys in mind; this perception creates greater stress and anxiety whenever girls and women interact.

As a result of gender roles assigned by different cultures, many women have been brought up to see technology and its use as exclusively reserved for the male gender. According to [21], women look at computers and see more than machines, thus considering computers as masculine and complicated to use. According to[22] many factors in and outside the classroom result in girls being turned away from computer technology. These factors include the media depicting men as experts in technology, societal expectations of different goals for boys and girls, the structure of learning tasks, the nature of feedback in performance situations and the organization of classroom sitting. Because these factors are often restrained, they go unnoticed. It is little wonder why boys are more knowledgeable in computer than girls.

1.6 Statement of the Problem

As Nigeria is gradually embracing the adoption of CBT, majority of the candidates still prefer PPT to CBT as clearly demonstrated in the 2013 UTME with the belief that their inadequate familiarity with the computers and the fear of using the computers generally might lower their performances in CBT. CBT was introduced to ensure prompt delivery of raw scores, eliminate cases of incomplete results, eliminate result blackout and check examination malpractices. These objectives will be an illusion if majority of candidates continue to embrace PPT and shun CBT. This study was embarked upon to examine the relative influence of candidates' personal characteristics on their performances in CBT. More specifically, this study sought to provide solutions to the following questions:

1. Would candidates' computer knowledge influence their performances in CBT?
2. Would candidates' computer anxiety influence their performances in CBT?
3. Would candidates' gender influence their performances in CBT?

This study would be significant as it would clear some issues on the perceived problems of CBT among the prospective candidates. It would also provide empirical data that will assist university managements and JAMB to improve on the conduct and administration of CBT in Nigeria in future.

1.7 Research Hypotheses

The following hypotheses were formulated to guide the study.

1. There is no significant joint contribution of computer knowledge and computer anxiety to the prediction of candidates' performance in CBT.
2. There is no significant individual contribution of computer knowledge and computer anxiety to the prediction of candidates' performance in CBT.
3. There is no significant difference in CBT performance of candidates with high, moderate and low test anxiety.
4. There is no significant difference in CBT performance of candidates with high, moderate and low computer knowledge.
5. There is no significant difference in the male and female candidates' computer anxiety.
6. There is no significant difference in the male and female candidates' computer knowledge.
7. There is no significant difference in the CBT performance of male and female candidates.

2. METHODOLOGY

The research design upon which this study was anchored is descriptive survey and ex-post facto designs. The entire 2013 JAMB candidates that registered and participated in the CBT UTME assessment mode in Nigeria formed the population for this study. Purposive sampling technique was used to choose One Federal and One State University in Ondo State, Nigeria for this exercise. Simple random sampling technique was used to select one hundred candidates that chose Federal University of Technology Akure (FUTA) or Adekunle Ajasin University, Akungba Akoko (AAUA) as their first choice. Fifty (50) prospective candidates were chosen from each of the institutions (25 males and 25 females).

2.1 Instrumentation

A questionnaire titled – Computer Attitudinal Questionnaire (CAQ) was used to collect data for this study. This questionnaire was divided into three sections. Section A deals with the demographic information of the respondents like their sexes, institution of first choice and so on. Section B was 20-item Computer Anxiety Scale (CAS) and Section C was 20-item Computer Knowledge Test (CKT). This questionnaire (CAQ) was personally developed by these researchers after wider consultations of the literature on the variables of interest. CAS was designed to elicit information from the candidates on their levels of computer anxiety. Candidates were asked to respond to the items therein on a four-point likert scale of Strongly Agree (SA) = 4 points; Agree (A) = 3 points; Disagree (D) = 2 points and Strongly Disagree (SD) = 1 point. Negative items were reversed. The table below shows samples of the items in CAS

		SA	A	D	SD
1.	Computers always make me scared				
2.	Computers always make me feel uncomfortable				
3.	I dislike operating machines generally				
4.	My heart beat increases when using computer				

CKT is also a 20-item multiple choice objective test with options A to D. examples of items in CKT are:

1. The flash disk is usually plugged into the computer's ……….
   a. UBS port   b. SUB port   c. USB port   d. BUS port
2. Which of these is not a component of the system unit
   a. CPU   b. RAM   c. Motherboard   d. DOS
3. The transistor was made to replace ………….
   a. Integrated circuit   b. Vacuum tube   c. Diode   d. Abacus
4. Computer network can be in any of the following forms except …………………
   a. Hyper network   b. Ring network   c. Bus network   d. Star network

2.2 Validation of the Instrument

To ensure the validity of CKT, the initial draft of the test items was given to 3 experts in the departments of computer education and test and measurement for criticisms. Their comments were incorporated to produce a copy for trial testing. On the basis of pilot test data, item analysis of the test was carried out. According to [23] and [24], items with discrimination index of 0.40 are very good ones, items with discrimination index of 0.30 to 0.39 are reasonably good but can be improved upon and items with discrimination index of 0.20 to 0.29 are marginal items and usually need improvement. Similarly, difficulty index of multiple choice items having four distracters should be 0.375 to 0.625. keeping in view of the above mentioned criteria, items having discrimination index less than 0.30 and having difficulty index below 0.20 (very difficult items) and above 0.80 (very easy items) were deleted. Final version of the test was later presented to the same panel of experts who validated initial draft and were of the opinion that the CKT was comprehensive, readable and of moderate difficulty level. To ensure the reliability of the test, the reliability of the first and final version of the test was calculated through Kuder-Richardson formula k_{21}. Reliability of both versions of the test was 0.82, which means that deletion of some items did not affect the reliability of the test.

To also ensure the validity of CAS, normal psychometric procedure was also followed to arrive at the final 20-items scale for this study. Using concurrent or convergent form of validity, this 20-items scale was administered concurrently with Computer Anxiety Sub-scale of [25] Computer Attitude Scale on sampled candidates that were not part of this study, their responses were subjected to Pearson Product Moment Correlation, a correlation coefficient of 0.86 was obtained. Using test-retest form of reliability with two weeks interval on 20 candidates that were not part of this study, reliability coefficient of 0.89 was obtained.

2.3 Method of Data Collection

Questionnaires for this study were personally administered on the sampled candidates at two popular Cyber-Cafés in Akure and Akungba where most JAMB applicants had their online registration for 2013 UTME. The administration of the questionnaire was done on different days at the two centers. All the questionnaires were completed and collected back the same day, which resulted in 100 percent response rate. The researchers ensured that the questionnaires were only given to the candidates who intended to take CBT. The researchers later visited the two institutions with a proforma to extract the scores of the sampled candidates with the aid of their registration numbers earlier indicated in the demographic section of CAQ. Data collected were collated and later analyzed using simple

Regression Analysis, ANOVA and t-test statistics. Simple percentile rank was also used to classify candidates into high, moderate and low computer anxiety or computer knowledge. Any candidate that scored 66th percentile and above in computer anxiety scale or computer knowledge test is said to have high computer anxiety or computer knowledge. Any candidate that scored 33rd percentile and above but below 66th percentile in computer anxiety scale or computer knowledge test is said to have moderate computer anxiety or computer knowledge. Any candidate that scored below 33rd percentile in computer anxiety scale or computer knowledge test is said to have low computer anxiety or computer knowledge.

3. RESULTS AND DISCUSSION

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 15.0. The hypotheses formulated were tested at 0.05 level of significance. The results are shown below

Hypothesis 1. There is no significant joint contribution of computer knowledge and computer anxiety to the prediction of candidates' performance in CBT

Table 1. Joint prediction of CBT performance by computer anxiety and computer knowledge

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	12578.346	2	6289.173	5.208	.007(a)
	Residual	117147.294	97	1207.704		
	Total	129725.640	99			

R = 0.311 R^2 = 0.097   Adjusted R^2 = 0.078   Standard error = 34.752
a Predictors: (Constant), KNOWLEDGE, ANXIETY b Dependent Variable: CBT

Results from Table 1 using Regression Analysis revealed that computer anxiety and computer knowledge when taken together jointly made significant contribution to the prediction of CBT performance. They accounted for 9.7 percent of the total variance in CBT performance (R^2 = 0.097, $F_{(2,99)}$ = 5.208, P<0.05). Computer anxiety and computer knowledge are therefore significant factors that can influence students performance in CBT.

Hypothesis 2. There is no significant individual contribution of computer knowledge and computer anxiety to the prediction of candidates' performance in CBT

Table 2. Individual contribution of computer anxiety and computer knowledge to the prediction of CBT performance

Model	Unstandardized coefficients		Standardized coefficients	t	Sig
	B	Std. error	Beta		
1 (Constant)	238.343	19.112		12.471	.000
ANXIETY	-1.344	1.380	-.094	-0.974	.332
KNOWLEDGE	1.191	0.394	.292	3.019	.003

a. Dependent Variable: CBT

Results in Table 2 using Regression Analysis revealed that computer knowledge alone made significant contribution to the prediction of performance in CBT, it accounted for 29.2 percent of the total variance in CBT performance, (t = 3.019, p<0.05). However, computer

anxiety alone accounted for 9.4 percent of the total variance in CBT performance in negative direction and not significant at 0.05 (t = -0.974, p>0.05)

Hypothesis 3. there is no significant difference in CBT scores of candidates with high, moderate and low test anxiety

Table 3. Anova showing difference in CBT performance of students with high, moderate and low test anxiety

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3935.651	2	1967.826	1.517	.224
Within Groups	125789.989	97	1296.804		
Total	129725.640	99			

From Table 3 using Analysis of Variance, F value is 1.517 but not significant at 0.05 level of significance ($F_{2,99}$ = 1.517, p>0.05).the hypothesis is upheld. It shows that there is no significant difference in CBT scores of students with high, moderate and low test anxiety

Hypothesis 4. There is no significant difference in CBT scores of candidates with high, moderate and low computer knowledge

Table 4. Anova showing difference in CBT performance of students with high, low and moderate computer knowledge

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1601.922	2	800.961	.606	.047
Within Groups	128123.7	97	1320.863		
Total	129725.6	99			

From Table 4 using Analysis of variance, F value is 0.606 and significant at 0.05 level of significance ($F_{2,99}$ = 0.606, p<0.05).the hypothesis earlier stated that there is no significant difference in CBT scores of students with high, moderate and low computer knowledge is hereby rejected. It shows that there is a significant difference in CBT scores of students with high, moderate and low computer knowledge

Hypothesis 5. There is no significant difference in the computer anxiety of male and female candidates

Table 5. t-test showing difference in test anxiety of male and female students

Variable	N	Mean	SD	S.E	df	tcal	sig
Male	50	33.34	10.137	5.13	98	0.697	0.487
Female	50	34.58	33.644	7.44			

Using t-test statistics, Table 5 shows that the value of t calculated is 0.697 but not significant at 0.05 level of significant (t_{cal}=0.697, p>0.05). The hypothesis earlier stated that there is no significant difference in the computer anxiety of male and female students is upheld. Both male and female students manifest the same level of computer anxiety.

Hypothesis 6. There is no significant difference in the computer knowledge of male and female candidates

Table 6. t-test showing difference in computer knowledge of male and female students

Variable	N	Mean	SD	S.E	df	tcal	sig
Male	50	9.56	2.63	0.37	98	2.086	0.040
Female	50	8.52	2.35	0.33			

From Table 6 using t-test statistics, the value of t calculated is 2.086, it is significant at 0.05 level of significance (t_{cal} = 2.086, p<0.040). The hypothesis earlier stated that there is no significant difference in the computer knowledge of male and female students is hereby rejected. Male students are more knowledgeable in computer than female students.

Hypothesis 7. There is no significant difference in the CBT performance of male and female candidates

Table 7. t-test showing difference in CBT performance of male and female students

Variable	N	Mean	SD	S.E	df	tcal	sig
Male	50	218.78	33.644	4.758	98	2.470	0.015
Female	50	201.34	36.883	5.126			

From Table 7 using t-test statistics, it shows that the value of t calculated is 2.470 and significant at 0.05 level of significance (t_{cal} = 2.470, p<0.05). The hypothesis earlier stated that there is no significant difference in the CBT performance of male and female students is hereby rejected. The mean performance of male students (218.78) is bigger than the mean performance of female students (201.34) in CBT performance.

3.1 Discussion of Results

Finding from hypothesis one showed that computer knowledge and computer anxiety were combined to make significant contribution to the prediction of candidates' performance in CBT. This finding corroborates the findings of [26-28] and [5] in which human personal characteristics such as Gender, Socio-economic status, Computer anxiety and Computer knowledge were seen as confounding factors that have joint impact on students' performance in CBT.

Finding from hypothesis two also showed that computer knowledge alone made significant contribution to the prediction of students' performance in CBT. Computer anxiety alone did not make significant contribution to the prediction of students' performance in CBT. This finding supports the views of [10,11] and [12] in which students' computer knowledge was significantly related to performance in CBT. But contradicts the findings of [6] and [8] in which computer knowledge has little or nothing to do with the performance of students in CBT. This finding also contradicts the findings of some studies that reported computer anxiety as a significant predictor of CBT performance [18] But in line with some studies that reported a non-significant relationship between computer anxiety and performance in CBT [16,17]. This finding is not coming as a surprise, it has earlier been posited by some researchers that inadequate knowledge of computers might increase the level of students' anxiety, which may invariably affect students performance in CBT [14]. In view of this

therefore, it can be concluded that computer knowledge made direct impact with CBT performance but computer anxiety made indirect impact with CBT performance.

Result from hypothesis three showed that there is no significant difference in CBT performance of candidates with high, moderate and low test anxiety. This finding is also not coming as a surprise. It has been shown in hypothesis two that computer anxiety alone is not a significant predictor of CBT performance [16,17]. It is therefore not expected to find a significant difference in CBT performance of candidates with high, moderate and low computer anxiety.

Finding from hypothesis four showed that there is a significant difference in CBT performance of candidates with high, moderate and low computer knowledge. This finding is also not coming as a surprise. It has been shown in hypothesis two that computer knowledge is a significant predictor of performance in CBT [10-12], it is therefore expected that significant difference will occur in CBT performance of candidates with varying computer knowledge abilities. Lee J. [29] as cited in [30] found that college students who have less computers experience performed worse on a computer-based Mathematics test. This deficit in performance he said could be corrected with minimal computer experience.

The result of hypothesis five also revealed that there is no significant difference in the computer anxiety of male and female candidates. This result also supports the result of [15] which claimed that there is no significant difference between male and female students' computer anxiety. Tekinarslan E. [15] further claimed that as students' computer experience and knowledge increase, computer anxiety level also decreases.

Finding from hypothesis six showed that there is a significant difference in the computer knowledge of male and female candidates. Male candidates were found in this study to be more knowledgeable in computer than their female counterparts. Male candidates use computers more often than female candidates. Female candidates are less interested and less confident in computer than male candidates [as cited in 31]. It is a common belief in Nigeria and the rest of Africa that male students are more talented in Science, Technology and Mathematics but female students are better than males in Liberal Arts. The result of this study is also consistent with a similar study conducted in Nigeria by [32] in which it was evidently stated that there is a gender difference in computer literacy skills of the students. In the study, male students had more access than females to the use of computers. Besides this, the number of hours male students spend using computers was more than that of the female students. In a similar vein [31] established a significant relationship between computer knowledge and utilization of both boys and girls. Olatoye RA. [6,31] further stated that there is a significant difference between male and female students with regard to computer utilization with male students utilizing computers more than female students. Clariana R. and Wallance P. [6] Further cautioned that the already existing gap between male and female students utilization of computers could widen as a result of computer testing. This finding further corroborates the findings of [33] in which significant difference was found in the computer knowledge and attitude between male and female students; although, female students was found in this study to be more knowledgeable in computers and have higher computer attitude than male students.

Result of hypothesis seven clearly showed that there is a significant difference in the CBT performance of male and female candidates in favour of male candidates. Differences in the CBT performance of male and female candidates could be attributed to factors inherent within and outside the classroom which result in less performance of girls in computer

technology. Such factors according to [21], include the media depicting boys as experts in technology, society expectations of different goals for boys and girls, the structure of learning tasks, the nature of feedback in performance situations and the organization of classroom sitting. Although, these factors are subtle, but could account for boys performing better in computer related testing than girls The only logical conclusion from this is that male candidates are more knowledgeable in computer than females, perhaps this might give them advantage to perform better in CBT. This finding contradicts the earlier findings of [8,6] in which no significant difference was found in the performance of male and female students in CBT. But the finding is partially in line with findings of [9] in which little significant difference was observed.

4. CONCLUSION AND IMPLICATION OF FINDINGS

The overall findings indicated that inadequate knowledge of computer can have adverse effect on candidates' performance in CBT. Although, computer anxiety alone did not show significant influence in CBT performance but inadequate knowledge of computer could trigger computer anxiety which could invariably influence candidates' performance in CBT. Male candidates outperformed female candidates in CBT because they were more knowledgeable in computer. Both male and female candidates showed the same level of computer anxiety. Computer knowledge alone could bring about variations in the level of their computer anxiety. This study implies that since human personal characteristics could affect students' performance in CBT, most especially the CBT candidates of 2013 UTME, it shows that these human personal characteristics could have more influence on the CBT performance of POST-UTME candidates. CBT was made optional in 2013 UTME, but some universities are now making it compulsory for all candidates in conducting POST-UTME without considering whether the prospective candidates sat for PPT, DBT or CBT modes of UTME.

RECOMMENDATIONS

It is therefore recommended that Government should provide secondary schools in the country with adequate computers and internet facilities to make students have enough practical sessions. CBT training centers should as a matter of urgency be set up by the institutions of higher learning and computer training institutes to train candidates on CBT before their examinations. It is therefore suggested that further studies should be conducted in Nigeria to compare the performance of students in CBT, DBT and PPT.

LIMITATION OF THE STUDY

In this study, computer knowledge and computer anxiety accounted for 9.7% of the total variance in CBT performance. The rest factors that could contribute to the performance in CBT are students' computer self-efficacy, computer attitude, CBT experience, test anxiety, features of a CBT system and test content. This study made use of One hundred (100) samples, perhaps an increase in the number of samples could bring about more authentic results.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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