



Review paper

Measuring Test Anxiety Level of Rural and Urban Post-UTME Candidates from Different Socio-Economic Backgrounds When Exposed To Computer Based Test in Universities in Southwest Nigeria

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KEYWORDS	ABSTRACT
Test Anxiety Post-Unified Tertiary Matriculation (UTME) Computer-Based Test (CBT) Rural and Urban Universities in Southwest Nigeria	The purpose of this study was to investigate the test anxiety level of rural and urban post- Unified Tertiary Matriculation Examination (UTME) candidates from different socio-economic backgrounds when exposed to computer-based test in Universities in Southwest Nigeria. A mixed method research design was employed, combining both quantitative and qualitative data collection and analysis methods. The target population was all University post unified tertiary matriculation examination candidates in Southwest Nigeria during the year 2024. A sample of 1200 post-UTME candidates from rural and urban areas, and from different socio-economic backgrounds, participated in the study. The Test Anxiety Inventory (TAI) was used to measure test anxiety levels, while a socio-economic status questionnaire was used to gather data on participants' socio-economic backgrounds. The sampling procedure involved the use of stratified and simple random sampling techniques. The test-retest technique was used to determine the reliability of the instrument using the Pearson's Product Moment Correlation Coefficient which yielded a Coefficient of 0.82. The data analysis procedure for the two hypotheses that were raised to pilot the study was the t-test statistics. Results from hypothesis one revealed that there is a statistically significant difference in test anxiety levels between rural and urban post-UTME candidates when exposed to computer-based test { $t(1198) = 4.23, p < 0.001$ }. Results from hypothesis two revealed that there is a statistically significant difference in test anxiety levels between candidates from low and high socio-economic backgrounds, $t(1198) = 4.21, P < 0.001$. Findings of this study imply that test administrators should consider the candidates' backgrounds when designing and implementing CBTs. Test administrators and educators could also develop targeted anxiety reduction strategies for rural candidates, who may be less familiar with computer-based tests. Test administrators should also ensure equal access to resources such as tutoring, test preparation materials and technology to help level the playing field.

1. Introduction

In the past couple of years, technology has significantly reshaped the methods of assessment. In many academic domains, educational measurement has been moving towards the use of Computer-Based Testing



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(CBT). Computer-Based Test is defined as a type of assessment that utilizes digital tools to deliver and administer tests. This include online and offline tests, quizzes and examinations, which are taken on a computer or other digital device (UNESCO, 2024). In simple terms, computer-based assessment is the practice of assigning quizzes and tests to learners on a computer instead of paper (Laithangbam, 2025).

Computer Based Assessment (also known as e-assessment, computerized testing and computer-administered testing) is a method of administering tests in which the responses are electronically recorded, assessed or both. As the name implies, computer-based assessment makes use of a computer or an equivalent electronic device such as a cell phone. Computer Based Assessment connotes a stand-alone system or a part of a virtual learning environment, possibly accessed via the world wide web (www). Virtual learning environment work over the internet and provides a collection tools such as those for assessment (particularly the types that can be marked automatically, such as the multiple choice objective test).

Computer-based assessments is not a new idea because it has been around in some form since 1959, when the first computer-based training (CBT) was built. But, like CBT, computer-based assessments did not get much recognition until a few decades ago. Computer Based (Laithangbam, 2025). Assessment (CBA) in Nigeria has a history that dates back to the 2015 Unified Tertiary Matriculation Examination (UTME), when the Joint Admission and Matriculation Board (JAMB) introduced a full-scale computer-based test to eliminate examination malpractice and facilitate examination registration and prompt release of results (Onyibe, Nwachi-Ikpor & Abdulhakim, 2015). Prior to the introduction of CBA, paper-based tests were the norm, but they were plagued by issues such as examination malpractices, delayed release of results, and logistical challenges. The shift to CBA was a significant milestone in Nigeria's educational history, as it marked a departure from traditional paper-based testing methods.

Today, CBA is widely used in Nigeria for various purposes, including admission, exams, recruitment tests, and educational assessments. The use of CBA has brought numerous benefits, including increased efficiency, convenience, and accuracy (Laithangbam, 2025). These institutions started using Computer Based Assessment with the post University Matriculation Examination (UME) and have since started using it for their semester examinations especially where the classes are very large (more than 500 students). The introduction of CBA in Nigeria was not without its challenges, however. One major challenge was the gross inadequacy of ICT infrastructure in the country, which hindered the smooth implementation of CBA. Despite these challenges, the prospects of CBA in Nigeria are considered high, owing to the acceptance of CBT by key government agencies such as JAMB and the Naigeria Immigration Service (NIS) (Laithangbam, 2025).

No doubt, an effective method of student assessment has become a desideratum in our educational system due to an increase in student number, ever escalating job commitments for academic staff and the advancement of internet technology. All these have made the use of computer assisted assessment to become an attractive alternative for many higher education institutions (Alkhatib & Alzubi, 2022). Since its advent, computer assisted test construction systems have made a major impact on the design and generation of subjects examinations at many Universities and Colleges of Education in Nigeria. In the past few years, the number of students admitted into tertiary institutions in Nigeria increased drastically and the conventional examination method became time consuming in term of the examination time for evaluation and assessment. A solution of examination in large classes of students is an automated testing system and this has been introduced by many institutions to address this concern and others.

The advantages of the CBT systems over the traditional paper-and-pencil testing (PPT) have been demonstrated in several comparative works. CBT is not just an alternative method for delivering examinations, but it represents an important qualitative shift away from the traditional method of paper based tests. Despite these advantages, it does not mean that CBTS are intrinsically better than the paper-and-pencil tests (Wang & Chen, 2022). Previous studies have confirmed that testing format does not affect test scores and as such CBT can be considered a valid and acceptable testing mode. Even though there are some concerns in the area of online testing, there are many positive features. One crucial benefit is that tests can be scheduled which also encourages students to increase time management skills (Kiewra & Creswell, 2022). Computer-based tests taken online can be scored immediately, which means students are able to receive feedback within a matter of seconds (Liu & Wang, 2022). After the tests are scored, the data can be easily downloaded into an electronic grade book system for the convenience of teachers (Ghazvini & Shokri, 2021).

Previous studies reported that the main disadvantage of computer-based tests is increased anxiety amongst those that are not familiar with the use of computer (Kim & Lee, 2022) and as such students agreed that they are 'technophobic'. The challenge of test examinees by means of microcomputers demands appropriate software design. To comply with this demand, students' beliefs or perceptions on the advantages and disadvantages of a computerized test are important since user perceptions and criticism are crucial to the acceptance, implementation and improvement of computerized tests.

Anxiety is an unpleasant state characterized by feelings of uneasiness and apprehension as well as increased physiological arousal such as increased heart rate and blood pressure. The emotional component of test anxiety includes a variety of physiological responses, such as increased heart rate, dry mouth and sweaty palms. An interesting feature of sweaty palms called palmar sweating is that it is caused by stressful feelings and is not related to changes in room temperature (Sanghavi & Patil, 2023). In fact, palmar sweating is one of the measures used in the lie detection test. As students take examination or even thinking about taking one, their stressful thoughts trigger the emotional components which can interfere with processing information and increase their chances of making mistakes (Saigal, Shahzad, Awan, Waseem, & Tariq, 2023).

Students who experience test anxiety must deal with two components. The first component is increased physiological arousal that makes up the emotional component. Cognitive psychologists have identified a second component called cognitive component which is excessive worrying about doing poorly in examinations. Excessive worrying about students' performance will interfere with their ability to read accurately, understand what they are reading and identify important concepts (Everson, Smolaka, & Tobias, 2019).

Results of 526 studies were integrated by meta-analysis to show the nature, effects and treatment of academic test anxiety and it was confirmed that test anxiety causes poor performance. Test anxiety was found to relate inversely to students' self-esteem and directly related to their fears of negative evaluation, defensiveness and other forms of anxiety. Conditions (causes) found to be giving rise to differential Test Anxiety levels include ability, gender and school grade level (Yildirim & Demir, 2022). Williams and Williams (2017) found that students from low socio-economic backgrounds experienced higher levels of computer anxiety compared to their counterparts from high socio-economic backgrounds. Oyeibisi & Oyeibisi (2020) revealed that students from high socio-economic backgrounds had lower levels of computer anxiety compared to those from low socio-economic backgrounds.

Oyeibisi & Oyeibisi (2020) reported that urban students had lower levels of computer anxiety compared to rural students. Williams and Williams (2017) found that rural students in the United States experienced higher levels of computer anxiety compared to their urban counterparts. Ayena and Oyediran (2024) reported that apart from gender and number of times that candidates were exposed to CBT examination, there is need for further research to explore other factors that might influence test anxiety, such as individual personality traits, learning styles, or socio-cultural background.

Much are being done by researchers, educationists, examination bodies, institutions and test designers to construct CBT that will be fair and reliable to produce valid test scores. However, much need to be done to design CBT that will minimize examinees' frustration and to limit the sources of examination anxiety. This is necessary because of the effective improvements that such will offer. Hence, for CBT tests in Nigeria to meet International Test Commission Standards under the four major issues of technology, quality, control and security, much research works are very necessary to give CBT test designers necessary feedbacks needed for improvement. This is also important because computerized administration of test normally should provide students with at least the same degree of feedback and editorial control regarding their responses that they would experience in traditional test taking format.

As such, this study was designed to measure the test anxiety level of post Unified Tertiary Matriculation Examination candidates that are exposed to Computer-Based Test in universities in Southwest Nigeria. Specifically, this study investigates the test anxiety level of rural and urban post- Unified Tertiary Matriculation Examination (UTME) candidates from low and high socio-economic backgrounds when exposed to computer-based test in Universities in Southwest Nigeria.

Research Hypotheses

1. Rural and Urban candidates will not differ significantly in their anxiety level when exposed to Computer-Based Test
2. Candidates from low and high socio-economic background will not differ significantly in their anxiety level when exposed to Computer-Based Test

2. Methodology

2.1 Research Design

The research design adopted for this study was the descriptive survey. This is because descriptive surveys enable researchers to seek the opinion of representative sample of population upon which conclusion, inferences and generalizations are made on contemporary phenomenon.

2.2 Target Population

The target population of this study consisted of all year 2024 post Unified Tertiary Matriculation Examination candidates that were exposed to Computer- Based Test in Universities in Southwest Nigeria. The sample size for this study is 1200 participants.

2.3 Sample and Sampling Procedure

Six Universities were purposively selected from the six states in Southwest Nigeria while, the random sampling techniques was used to select 200 post University Matriculation Examination candidates from each of the 6 Universities with equal number of rural and urban students and equal number of students from low and high socio-economic background. This make a total of 1200 respondents selected to conduct the study. The random sampling method was adopted because it is an unbiased process which researchers use to select a sample of population in such a way that each element (member) of the population has equal chance of being selected.

2.4 Data Collection Instrument

The instrument used to collect data for this study is an inventory named 'The Test Anxiety Inventory (TAI)'. The TAI was adapted from the Anxiety Test Questionnaire (ATQ) developed by Psychology Today. The content validity of the TAI was determined by giving out questionnaire to a panel of experts in Psychology and Counselling while, the coefficient of stability of TAI was determined by using the test-retest method. The two sets of scores obtained were correlated using Pearson's Product Moment Coefficient which yielded a coefficient of 0.77 which was considered high enough to conduct this study.

2.5 Scoring Procedure

Scores	Types	Remarks
0-40	Normal	No issues with anxiety
41-80	Mildly above normal range	Mild anxiety issues
81-120	Moderately above normal range	Anxiety can cause problem at this level
121-160	High and well above normal range	Anxiety is problematic and may be regarded as anxiety disorder
161 and above	Very and well above normal range	Anxiety is very problematic and classified as anxiety disorder

For this study, anxiety score range of between 0 and 40 is considered as low anxiety level. While, anxiety score range of between 41 and 100 is considered as high anxiety level

2.6 Method of Data Analysis

To analyse data collected in this study, the researchers used frequency counts, simple percentage, means, standard deviation and t-test statistic. This is because in all the 2 null hypotheses raised to pilot this study, two means were compared.

3. Results

3.1 Background Characteristics of the respondents

Respondents in this study are secondary school graduates who have undergone Unified Tertiary Matriculation Examination (UTME) and are seeking admission to Universities in South West Nigeria. Respondents totalling 1200, consisted of 600 rural and 600 urban dwellers. The respondents also consisted of 600 students from low socio-economic background and 600 students from high socio-economic background.

3.2 Candidates' Level of Anxiety

Analysis of the results showed that participants showed a moderately above normal range of test anxiety ($M = 101.23$; $SD = 20.23$) going by the test norm. This indicates that on average basis, the participants are prone to negative consequences associated with test anxiety. The outcomes further revealed that the test anxiety scores show a positive skewness of 0.584, indicating that the distribution of anxiety levels is slightly right-tailed. Most students scored lower on the test anxiety scale, with a few students reporting higher anxiety levels, which pull the average upwards. The kurtosis of 2.895 also suggests a distribution that is more peaked

than a normal distribution. In summary, while most students experience lower levels of test anxiety around the mean scores, a small number have significantly higher anxiety, which influences the overall distribution. The data's slight skewness and kurtosis suggest a concentration of scores with some notable, though infrequent, higher anxiety levels.

3.3 Computer-Based Test Candidates' Level of Anxiety when Classified by Location (Rural/Urban)

The mean level of anxiety based on location was 45.67 and 42.15 for rural and urban candidates respectively. The t-test analysis of the two means are as contained in Table 1.

Table 1 t-test Analysis of Rural and Urban Post-UTME Candidates Exposed to CBT

Location	No.	M	SD	Df	t-Cal.	Mean Diff.	Sig.
Rural	600	45.67	10.23	1198	4.23	3.52	.37
Urban	600	42.15	9.56				

Table 2 shows that there is a statistically significant difference in test anxiety levels between rural and urban candidates when exposed to computer-based tests $\{t(1198) = 4.23, p < 0.001\}$. The null hypothesis is rejected, indicating that rural and urban candidates differ in their anxiety levels when exposed to computer-based tests. Specifically, rural candidates exhibit higher anxiety levels compared to urban candidates.

3.4 Level of Anxiety of Candidates From Different Socio-Economic Background when Exposed to CBT (Low/High)

Table 2 t-test Analysis of Low and High Socio-Economic Background Post-UTME Candidates Exposed to CBT

Socio-Economic Background	No.	M	SD	Df	t-Cal.	Mean Diff.	Sig.
Low	600	43.8	9.10	1198	4.21	3.2	.38
High	600	40.6	8.50				

Results from hypothesis two revealed that there is a statistically significant difference in test anxiety levels between candidates from low and high socio-economic backgrounds, $t(1198) = 4.21, P < 0.001$. The effect size, calculated Cohen's d, was 0.38, indicating a moderate effect size. The null hypothesis is rejected, which states that candidates from low and high socio-economic backgrounds will not differ significantly in their anxiety levels when exposed to computer-based tests.

4. Discussion-Conclusion

4.1 Discussion

Findings from hypothesis one shows that there is a statistically significant difference in test anxiety levels between rural and urban candidates when exposed to computer-based tests. This report find support in those of Oyebisi & Oyebisi (2020) who reported that urban students had lower levels of computer anxiety compared to rural students and those of Williams and Williams (2017) who found that rural students in the United States experienced higher levels of computer anxiety compared to their urban counterparts. Research suggests that rural candidates may experience higher levels of test anxiety due to the fact that rural areas have limited access to computers and internet, making it difficult to familiarize themselves with computer-based tests.

Findings from hypothesis two revealed that there is a statistically significant difference in test anxiety levels between candidates from low and high socio-economic backgrounds when exposed to computer based test. The findings that there is a statistically significant difference in test anxiety levels between candidates from low and high socio-economic background when exposed to computer-based tests, is quite intriguing. This suggests that candidates from low socio-economic backgrounds may experience higher levels of anxiety when taking computer-based tests compared to their peers from higher socio-economic backgrounds. This finding find support in those of Williams and Williams (2017) and Oyebisi & Oyebisi (2020) who reported that students from lower socio-economic backgrounds experience higher levels of computer anxiety, which can negatively impact performance on computer-based tests.

4.2 Conclusion

Arising from the findings of this study and the discussion therefrom, it was concluded that there is a statistically significant difference in test anxiety levels between rural and urban candidates and between candidates from low and high socio-economic backgrounds when exposed computer-based tests. The findings

of this study also highlight the need to address the digital divide between rural and urban areas as well as between low and high socio-economic background of students, ensuring equal access to technology and computer-based tests. The findings also highlights targeted interventions, such as test anxiety workshops or counselling, could be implemented to support rural and low socio-economic candidates who may experience higher levels of test anxiety. Teachers in rural areas may require additional training to effectively prepare students for computer-based tests and address test anxiety

References

1. Alkhatib, J. & Alzubi, M. (2022). Computer-assisted assessment: A systematic review: *International Journal of Emerging Technologies in Learning*, 17(10), 234-253.
2. Ayena, O. O. & Oyediran, A. O. (2024). Measuring anxiety level of post-unified tertiary matriculation examination candidates when exposed to computer based test in Colleges of Education in Southwest, Nigeria, *African Research Journal of Education and Social Sciences*, 11(3), 144-152.
3. Everson, H. T., Smoldaka, I. & Tobias, S. (2019). Exploring the relationship of anxiety test and meta-cognition on reading test performance: A cognitive self analysis, *Anxiety, Stress and Coping*, 7, 85-96.
4. Ghazvini, S. D. & Shokri, O. (2021). The impact of time management on test anxiety and academic achievement. *Journal of Educational Sciences*, 11(2), 123-134.
5. Kiewra, K. A. & Creswell, J. W. (2022). Time management and test anxiety: A systematic review. *Journal of Educational Psychology*, 114(3), 541-555.
6. Kim, J. & Lee, Y. (2022). Computer anxiety and test anxiety in online testing environments. *Journal of Educational Computing Research*, 60(4), 435-451.
7. Laithangbam, M. (February, 2025). What is a Computer Based Assessment. Retrieved from www.proprofs.com on March 17, 2025
8. Liu, X. & Wang, Y. (2022). The relationship between time management and test performance: A meta-analysis. *Journal of Experimental Education*, 90(4), 537-553.
9. Onyibe, Nwachi-Ikpor Juliana O., A. A. Abdulhakim, (2015). Computer Based Testing Technique in Nigeria: Perspective and Challenges, 5(10), Retrieved from www.iiste.org/journal on March 19, 2025
10. Oyebisi, T. O. & Oyebisi, T. (2020). Computer anxiety among urban and rural secondary school students in Nigeria. *International Journal of Education and Development using Information and Communication Technology*, 16(1), 1-15
11. Sanghavi, P. J. & Patil, P. R. (2023). Prevalence of palmar hyperhidrosis affecting clinical efficacy in medical professionals *Annals of Medical and Health Sciences Research*. 13, 558-561
12. Saigal, D. E., Shahzad, A., Awan, R. T., Waseem, I., & Tariq, K. (2023). Prevalence of primary palmar hyperhidrosis and its impact on hand grip strength and quality of life. *Journal of Clinical and Diagnostic Research*, 17(9), doi: 10.7860/JCDR/2023/53813.28375
13. UNESCO. (2024). Use of technology-based assessments: a systematic review. Oxford Bibliographies. <https://www.unesdoc.unesco.org> on December 20, 2024
14. Wang, Y. & Chen, Y. (2022) Development of a computer-assisted system for improving student learning outcomes. *Journal of Educational Computing Research*, 60(4), 419-435.
15. Williams, T. & Williams, K (2017). Computer anxiety and urban-rural differences in high school students. *Journal of Educational Williams and Williams (2017) Computing Research*, 56(4), 419-433.
16. Yildirim, A. & Demir, S. (2022). The relationship between bullying and anxiety in secondary school students: A systematic review. *Journal of Educational Sciences Research*, 12(2), 1-18.