

Impact of Computer-Based Test in Senior Secondary Schools on Candidates Performance in Utme in Bali Local Government Area of Taraba State

Wycliff Obed Jatau¹

Mohammed Hamidu²

^{1,2}Information & Communication Technology Unit (ICT) Federal Polytechnic Bali Taraba State, Nigeria

Abstract: This study examined Impact of computer-based test in senior secondary schools on candidates' performance in UTME in Bali local government area of Taraba State. It argues that the impact of Computer Based Test (CBT) in senior secondary schools will enhance students' performance in the Unified Tertiary Matriculation Examination (UTME). The population for the study comprised of 600 students from selected senior secondary schools in Bali Local Government Area of Taraba State. All students were used for the study, hence there is no sample techniques adopted for the study. Chi-square on a 5-point rating scale was used to analyze the data. A significance level of 0.05 indicates a 5% risk of concluding that an association between the variables exists when there is no actual association and a t-test was used to test the null hypotheses at 0.05 level of significance. The findings of the study revealed among others that students took the UTME amidst a lot of challenges such as inadequate computer systems, power supply, and fear of the CBT system. Based on the foregoing, the study concludes that not adopting CBT in secondary schools has contributed immensely to students' failure in UMTE. But implementing the CBT system will help achieve better results. It was recommended among others that computer literacy should be part of the prerequisite for teachers' employability, for good performance in UTME, CBT examination should be administered at all secondary school levels. Government should provide an enabling environment and make computers and infrastructure available for implementing the CBT system.

Keywords: Computer Based Test, UTME, Secondary School Students, Performance

INTRODUCTION

Most schools in our nation, both private and public, utilize electronic means to facilitate and administer examinations for students through computerized methods. Similarly, diverse examination bodies also utilize electronic means to register their respective candidates for examinations (Olawale 2010). This indicates that computer-based testing is no longer a novel innovation. Students from various disciplines, such as science, arts, engineering etc, can be evaluated through electronic means. Students may also be assigned essays to write and edit, through electronic means, such as word processors or other developed platforms. Equally, computers can automatically score essays and promptly provide feedback to students, along with instructions for improvement.

Computer-based test (CBT) is a method of conducting exams where the questions and answer options are presented electronically on a computer screen. This method of assessment has been introduced in various senior secondary schools for students to familiarize themselves with the set-up before they take the Unified Tertiary Matriculation Examination (UTME). Fadilah, Rahmi, and Shofa. (2021) and Rosdiana, Rosdiana (2018) discoursed that Computer Based Test (CBT) is a test conducted using a computer as the main medium for administering and processing exam scores where the test questions and answer sheets are carried digitally by the computer. Accordingly, Fedorak. (2015) also agreed that Computer-based Test is a technique used to evaluate students' knowledge using technological advancements, thereby eliminating subjective elements and improving objectivity.

Thus, the emergence of computer-based testing (CBT) has replaced the traditional method of Paper and Pencil Test (PPT) which is more stressful and with a lot of errors compare to computer based. CBTs are considered more advantageous than PPTs owing to their efficiency, clarity, and ability to ease illegal

conduct in the traditional evaluation (Rino, Noni, Okki, and Ambarwati 2018). Computer Based Test is an evaluation system that used computer-assisted techniques to facilitate teachers' efficient and effective test administration, scoring, and evaluation processes (Sugiyono, Sutarman, Tri, and Rochmadi 2019). Students' performance refers to the evaluation and assessment of students' academic achievements and progress in their studies (Zhang and Xiaoyi 2015). Therefore Performance is a definite success of tasks leading to the accomplishment of specified goals of an organizational (Halilu, and Wilson 2018). Performance is important for organizational success. The impact of computer-based tests in senior secondary schools on candidates' performance in UTME can be both positive and negative. One of the positive impacts is that it helps candidates become more comfortable and familiar with the computer-based set-up of UTME. This reduces the anxiety and stress associated with navigating through the computer interface and answering questions on a computer screen. Equally Gede, Ketut, and Tirtayasa (2021) maintain that implementation of CBT method has been found to effectively reduce anxiety, academic stress, thus leading to significant improvements in candidates' perceptive behavioral on CBT examination. By practicing with computer-based tests in their senior secondary schools, candidates gain confidence in their ability to perform well in the UTME, ultimately improving their overall performance. Another positive impact is that computer-based tests provide immediate feedback to candidates. This allows them to identify their areas of strengths and weaknesses and work towards improving their performance. In Nigerian schools, it can be observed that there has been a noticeable improvement in the academic performance of students. This is particularly evident when compared to the era of paper-based examination. CBT has a positive influence on students' performance (Olafare, Boor, Charity, Mwuese, 2017). In traditional paper-based tests, it takes a longer time for the results to be released, which may delay their feedback and hinder their progress in addressing their weaknesses. Computer-based tests provide a more efficient and effective way of assessing candidates' performance and giving them timely feedback. One of the benefits required for computer-based assessment is that it can improve students' performance in collective assessments (Ricketts & Wilks 2002). Research reveals that secondary school students' performance in various areas was improved through the adoption of computer-assisted instruction, surpassing that of traditional pen and paper methods (Mudasiru, Adedeji, Olufemi, and Afolabi 2009).

In 2015, the Unified Tertiary Matriculation Examination (UTME) in Nigeria go through a comprehensive computerization process, thereby moving it into a vast university admission examination. However, despite the digitization of the examination, the presence of a knowledge gap and digital gap in some parts of the nation has persisted, possibly obstructing students' performance in computer-based tests (CBT). As a result, the anxiety surrounding the effect of these factors on students' performance despite the UTME's digital transformation remains a noteworthy concern (Abdulkareem, & Lennon 2023).

The advent of technology has prompted many secondary schools to adopt computer-based testing systems. Teachers must acquire a comprehensive understanding of the possible significances of switching from traditional paper-based evaluations to computer-based assessments on the academic achievements of students (Joy 2023). This is especially significant as classroom technology continues to advance and teachers gradually become more proficient in technological aspects. This becomes even more critical when teachers have the ability to develop computer-based assessments that are used by students in various classrooms and for learning purposes.

Contrariwise, the traditional method of conducting pen-and-paper examinations, which is invariably prone to errors, stress, and time consumption, has impacted their performance in Unified Tertiary Matriculation Examination (UTME), which are computer-based. The archaic paper and pen approach to conducting exams that have been in existence for years may not be suitable in this era of technology due to the challenges often encountered such as examination malpractices, bribing, impersonation, and the use of unlawful devices, examination venue, capacity constraints, delayed release of results, the cost implication of printing examination materials, and human error which calls into question the quality of results (Osuji, 2012). This underscores the need for the automation of the examination system (Fagbola,

Adigun and Oke 2013). With the shift towards e-learning or computer-based testing, modern technologies are being engaged in several e-learning settings to evaluate students' progress (Hakami, Husin, and Tam 2014) and (Sarjiyus 2018). The utilization of the Computer Based Test System (CBTS) in Nigeria has become more widely accepted in mass-driven examination, as it is a means of minimizing time consumption during marking and assessment, while also providing error-free computations and results. Adedoyin (2022), Edeh (2021), and Inegbenehi (2019), claims that the high rate of failure in JAMB is a crucial issue that cannot be overlooked. The reason for their failure among other is Failure to read, Procrastination, Depending solely on past questions, Not reading instructions properly. However, it is evident that despite the pervasive failure and poor performance, certain candidates demonstrate exceptional aptitude. Historically, a statistically insignificant number of candidates have excelled in the test. Nevertheless, their accomplishment is not without diligent effort. Among the various factors that contribute to candidates' UTME failure is their perception of the exam. Over the years, a significant number of candidates have regarded UTME as an extremely difficult examination. This perspective has created a negative impression in their minds. Jason (2021) maintain that candidates exhibiting important levels of trait test emotion are predisposed to encountering negative emotions in the context of computer-based examinations. In contrast, students who have undergone traditional paper-based assessments exhibit lower intensities of negative effect relative to those who have solely engaged in computer-based testing. Additionally, Okoye, Faith and Ogechukwu (2019) argue that the challenges encountered in the CBT Jamb exams have a profound impact on the academic performance of candidates. Insufficient infrastructure and power outages are also significant factors that affect academic performance.

STATEMENT OF PROBLEM

In contemporary times, various governmental and private establishments, including secondary schools, have implemented computer-based testing systems. However, it appears that our immediate area has given scanty consideration to the adoption of Computer Based Tests (CBT). Even though many secondary schools in Bali local government possess computer facilities, it is observed that, they are not fully been put in use, even for routine activities such as CBT examinations. As a result, most students are accustomed to traditional pen-and-paper examinations, which are often susceptible to errors, stress, and time consumption. Although it is valid that some candidates will perform well regardless of mass failure or poor performance, others have achieved success through hard work. Nevertheless, it has been observed that majority of candidates in our environment fail UTME, and this can be attributed to their apprehensive view of the exam. Over the years, many candidates have perceived UTME to be an extremely challenging exam, leading to negative impressions. Procrastination, cramming past questions, and waiting for emergency answers or miracle centers are all contributing factors to student failure. As a result, some candidates' performance in Unified Tertiary Matriculation remains unfortunate.

AIM AND OBJECTIVES OF THE STUDY

The paper examines Impact of Computer Based Test in senior secondary schools on candidates' performance in UTME in some selected senior secondary schools in Bali LGA of Taraba State.

The specific objectives are to:

Examine how access to computers affect the performance of students in UMTE in Bali Local Government
Challenges hindering the implementation of CBT system in Bali Secondary schools.

Research Questions

The following research questions guided the study:

Q1. How do access to computers affect the performance of students in UTME in Bali Local Government?

Q2. What are the Challenges hindering the implementation of CBT system in Bali Secondary schools?

METHODOLOGY

The study adopted a survey research design in obtaining data for the study. Population for the research comprises of seven hundred and four (600) students from SSS II-III (Government Secondary School Bali (218), Burba secondary school Bali (212), Creme-de-La-Crème secondary school (14), Government Day secondary school Suntain (13) Garba-Chede secondary school (85), Government Day Secondary School Mai-Hula (58) all in Bali local government area of Taraba State. There was no sample techniques adopted for the study due to the manageable size of the population. The instrument adopted for the study was structured questionnaire. Research questionnaire one to two has adopted a five-step Likert Scale which will consist of Strongly Agree (SA) 5-point, Agree (A) 4 points, Undecided (UN) 3-points, Strongly Disagree (SD) 2-points, Disagree (DA) 1-point options. Likert Scale which according to Likert (1932) is used to gauge attitudes, values, and opinions is consistent with the survey research design which this study has adopted. The questionnaires were administered and collected by the researchers and research assistants. Data collected were analyzed using Chi-square with the aid of statistical software SPSS. To calculate chi-square we take the square of the difference between the observed (o) and expected (e) values and divide it by the expected value. A significance level of 0.05 indicates a 5% risk of concluding that an association between the variables exists when there is no actual association.

PRESENTATION OF THE RESULT

Research Question One: How does access to computer systems in Bali Secondary schools influence the performance of students in UTME?

Observed	Expected	E^2	$(O - E)$	$(O - E)^2$	$\frac{(O - E)^2}{E^2}$
397	326	106276	71	5041	0.0474
315	326	106276	-11	121	0.0011
315	326	106276	-11	121	0.0011
333	326	106276	7	49	0.0005
273	326	106276	-53	2809	0.0264
323	326	106276	-3	9	0.0001
142	162.17	26298.03	-20.17	406.69	0.0155
193	162.17	26298.03	30.83	950.69	0.0362
165	162.17	26298.03	2.83	8.03	0.0003
158	162.17	26298.03	-4.17	17.36	0.0007
152	162.17	26298.03	-10.17	103.36	0.0039
163	162.17	26298.03	0.83	0.69	0.0000
26	58.67	3441.78	-32.67	1067.11	0.3100
52	58.67	3441.78	-6.67	44.44	0.0129
64	58.67	3441.78	5.33	28.44	0.0083
57	58.67	3441.78	-1.67	2.78	0.0008
104	58.67	3441.78	45.33	2055.11	0.5971

49	58.67	3441.78	-9.67	93.44	0.0272
14	27.67	765.44	-13.67	186.78	0.2440
23	27.67	765.44	-4.67	21.78	0.0285
25	27.67	765.44	-2.67	7.11	0.0093
29	27.67	765.44	1.33	1.78	0.0023
45	27.67	765.44	17.33	300.44	0.3925
30	27.67	765.44	2.33	5.44	0.0071
19	23.5	552.25	-4.5	20.25	0.0367
15	23.5	552.25	-8.5	72.25	0.1308
29	23.5	552.25	5.5	30.25	0.0548
21	23.5	552.25	-2.5	6.25	0.0113
24	23.5	552.25	0.5	0.25	0.0005
33	23.5	552.25	9.5	90.25	0.1634
			X²		2.1707

Source: Field Survey 2023

Since the number of categories is five (5) where $k = 5$ and $v = k - 1 = 5 - 1 = 4$, the critical value $X_{20.95}$ for five degrees of freedom is 9.488. thus since $2.1707 < 9.488$, we accept the null hypothesis and reject the alternative hypothesis which says Access to computer systems influences the performance of students in UTME in Bali Secondary School.?

Research Question Two: What are the challenges hindering the implementation of the CBT system in Bali secondary schools?

Observed	Expected	E^2	$(O - E)$	$(O - E)^2$	$\frac{(O - E)^2}{E^2}$
349	286.10	81853.21	62.90	3956.41	0.0483
321	286.10	81853.21	34.90	1218.01	0.0149
277	286.10	81853.21	-9.10	82.81	0.0010
244	286.10	81853.21	-42.10	1772.41	0.0217
279	286.10	81853.21	-7.10	50.41	0.0006
263	286.10	81853.21	-23.10	533.61	0.0065
289	286.10	81853.21	2.90	8.41	0.0001
252	286.10	81853.21	-34.10	1162.81	0.0142
277	286.10	81853.21	-9.10	82.81	0.0010
310	286.10	81853.21	23.90	571.21	0.0070
176	203.70	41493.69	-27.70	767.29	0.0185
182	203.70	41493.69	-21.70	470.89	0.0113
216	203.70	41493.69	12.30	151.29	0.0036
231	203.70	41493.69	27.30	745.29	0.0180
218	203.70	41493.69	14.30	204.49	0.0049
219	203.70	41493.69	15.30	234.09	0.0056
215	203.70	41493.69	11.30	127.69	0.0031
216	203.70	41493.69	12.30	151.29	0.0036

191	203.70	41493.69	-12.70	161.29	0.0039
173	203.70	41493.69	-30.70	942.49	0.0227
33	57.20	3271.84	-24.20	585.64	0.1790
45	57.20	3271.84	-12.20	148.84	0.0455
54	57.20	3271.84	-3.20	10.24	0.0031
67	57.20	3271.84	9.80	96.04	0.0294
58	57.20	3271.84	0.80	0.64	0.0002
67	57.20	3271.84	9.80	96.04	0.0294
56	57.20	3271.84	-1.20	1.44	0.0004
73	57.20	3271.84	15.80	249.64	0.0763
64	57.20	3271.84	6.80	46.24	0.0141
55	57.20	3271.84	-2.20	4.84	0.0015
25	30.80	948.64	-5.80	33.64	0.0355
30	30.80	948.64	-0.80	0.64	0.0007
27	30.80	948.64	-3.80	14.44	0.0152
34	30.80	948.64	3.20	10.24	0.0108
26	30.80	948.64	-4.80	23.04	0.0243
30	30.80	948.64	-0.80	0.64	0.0007
26	30.80	948.64	-4.80	23.04	0.0243
35	30.80	948.64	4.20	17.64	0.0186
39	30.80	948.64	8.20	67.24	0.0709
36	30.80	948.64	5.20	27.04	0.0285
15	20.20	408.04	-5.20	27.04	0.0663
20	20.20	408.04	-0.20	0.04	0.0001
24	20.20	408.04	3.80	14.44	0.0354
22	20.20	408.04	1.80	3.24	0.0079
17	20.20	408.04	-3.20	10.24	0.0251
19	20.20	408.04	-1.20	1.44	0.0035
12	20.20	408.04	-8.20	67.24	0.1648
22	20.20	408.04	1.80	3.24	0.0079
27	20.20	408.04	6.80	46.24	0.1133
24	20.20	408.04	3.80	14.44	0.0354
				X2	1.2787

Source: Field Survey, 2023

Using the $\chi = \sum(o-e)^2/e^2 = 15039.80/1279754.20 = 1.2787$

And the tabulated value is 9.488 using five categories where $k = 5$, $V = k - 1 = 5 - 1 = 4$, since the calculated value is less than the tabulated values we cannot reject the theory at the 0.05 level of significance. So we cannot reject the null hypothesis which says inadequate funding, power supply, training, and ICT facilities have hindered the implementation of the ICT center in Bali Secondary Schools.

DISCUSSION OF FINDINGS

Based on the findings, it is evident that the majority of students are accustomed to the traditional system of using pen and paper, with many of them having no prior experience with computers. In addition, the limited availability of computers in some selected secondary schools in Bali town has had negative impacts on the large population of students, as poor computer knowledge and power supply issues have affected their performance in UTME. The anxiety of computer-based test examinations has also led to many students failing UTME, as they perceive it to be a difficult task. This is in line with Nnamdi, Comfort, Mary, Christiana, Nneamaka, and Anujeonye. (2019) noted that certain inadequacies of CBT, such as the insufficiency of indispensable infrastructural amenities and the difficulties linked with its execution have contributed to students' failure. Therefore, there is a pressing need to adopt CBT systems in secondary schools to address the numerous problems associated with UTME failure in our immediate environments. To authenticate the modules of the context, a survey was conducted in six secondary schools in Bali local government area. The research shows that CBT systems can be implemented to enhance and enrich student outcomes in UMTE by effectively implementing computer-based tests in secondary schools that cater to the needs of students and their learning environment. The results of this study support the assertions made by Adedoyin (2022) and Adewale (2019), who noted that the poor performance in UTME was due to fear, incompetence in computer usage, and perception of CBT. A large number of students in Bali Local government area prefer pen and paper examinations to CBT due to inadequate computer training, poor knowledge, and fear of operating computers.

CONCLUSION

In conclusion, the need for a computer-based test system in our secondary schools cannot be overstated. The introduction of computer-based tests in senior secondary schools has had a positive impact on students' performance in the UTME. It has familiarized students with the UTME format, enhanced their confidence, improved their time management skills, and enabled better preparation. This is similar to Olafare, Boor, Charity, Mwuese, (2017) who noted that CBT has a positive influence on students' performance. The integration of CBT in senior secondary schools is recommended as a valuable tool for UTME preparation. Based on the foregoing, the study concludes that the failure to adopt computer based test in secondary schools has significantly contributed to students' failure in UMTE. However, implementing it will help achieve better results, this is in line with Ricketts & Wilks (2002) that said one of the benefits of computer-based assessment is that it can improve student performance in collective assessments.

RECOMMENDATIONS

- Local Government Education Authority in collaboration with School proprietors should create awareness and training to familiarize students with the CBT systems before the commencement of the JAMB examination, this will assist to reduce their anxiety.
- Government should provide an enabling environment and make computers and infrastructure available for implementing the CBT system as well as enforcing policy on computer-based tests at the secondary school levels.

- School proprietors and training centers should adopt the pattern of other examination bodies such as JAMB among others to expose students to practical aspects of CBT in their internal examination, this will enable them to adopt the CBT system.
- Computer Literacy should be part of the prerequisite for a teacher's employability. Where possible parents/guidance should provide a computer system at home with CBT tutorial software installed.

REFERENCES

- [1] Abdulkareem, Z., & Lennon, M. (2023). Impact of digital divide on students' performance in computerized UTME in Nigeria. *Information Development*.
- [2] Adedoyin Alao (2022), REASONS STUDENTS FAIL JAMB EXAMS Retrieved on 12th September 2022 from <https://blog.scholarly.africa/reasons-students-fail-jamb-examinations/#>
- [3] Edeh Samuel Chukwuemeka (2021), Why Students Fail JAMB Examination: 10 Reasons. Retrieved on 14th April 2021 from <https://bscholarly.com/why-students-fail-jamb-examination/>
- [4] Fedorak V., M., (2015). Computer Testing - Innovative Method of Student's Knowledge and Learning Achievements Control. *Galician Medical Journal*,
- [5] Halilu, Dahiru, Abba., Wilson, Mugizi. (2018). Performance of academic staff in polytechnics: an analysis of performance levels in North West geo-political zone of Nigeria. *Open Access Journal*,
- [6] Isaac Inehgbenehi (2019) Newspaper articles: Reasons why students fail Jamb and what you need Retrieved on 4th April, 2019 from www.flashlearners.com/10-reasons-may-fail-jamb2017
- [7] Jason, M., Harley., Jason, M., Harley., Jason, M., Harley., Nigel, Mantou, Lou., Nigel, Mantou, Lou., Yang, Liu., Maria, Cutumisu., Lia, M., Daniels., Jacqueline, P., Leighton., Lindsey, Nadon., Lindsey, Nadon. (2021). University students' negative emotions in a computer-based examination: the roles of trait test-emotion, prior test-taking methods, and gender. *Assessment & Evaluation in Higher Education*, 46(6), 956-972.
- [8] Joy, O. T. E. (2023). Impact of Computer-Based Tests on the Quality of Education in Nigeria. *International Journal of Information Technology & Computer Engineering (IJITC)* 3(03), 6-14.
- [9] Ling, Dr., I, Putu, Gede, Adiatmika., N., Adiputra., Ketut, Tirtayasa. (2021). Redesign of Computer-Based Test (CBT) With Total Ergonomic Approach to Reduces an Academic Stress and Improve The CBT Participants Score.
- [10] Lusi, Robiatul, Fadilah., Rianto, Rianto., Rahmi, Nur, Shofa. (2021). Penerapan Algoritma Profile Matching pada Aplikasi Computer Based Test (CBT) dalam Proses Seleksi Mahasiswa Baru.
- [11] Mudasiru, Olalere, Yusuf., Adedeji, Olufemi, Afolabi. (2009). Effects of Computer Assisted Instruction (CAI) on Secondary School Students' Performance in Biology. *Turkish Online Journal of Educational Technology*,
- [12] Nnamdi, Obikeze., Comfort, Amaechi, Ifeakor., Mary, Okwuchukwu, Akujieze., Christiana, Nneamaka, Anujeonye. (2019). Perception of lecturers on the use of computer based test (cbt) in nigerian public universities. 4(1)
- [13] Osuji, U. S. A. (2012). The use of e-assessment in the Nigerian higher education system. Retrieved March 22, 2015, from <http://tojde.anadolu.edu.tr/yonetim/icerik/makaleler/816-published.pdf>.
- [14] Okoye, Faith, Ogechukwu. (2019). Challenges of 2018 computer based test (cbt) jamb examination for senior secondary school students' academic performance in Anambra state, Nigeria. *European Journal of Education Studies*,
- [15] Olafare, Festus, Oladimeji, Boor, Charity, Mwuese, H. (2017). Computer based test: panacea to undergraduate students' performance in Olabisi Onabanjo University, Ogun State, Nigeria. *Educational Research*, 9(3):50-57.
- [16] Olawale ASM (2010). E- Exams System for Nigerian Universities with Emphasis on Security and Result Integrity. The Seventh International Conference on e-learning for Knowledge-Based Society.

- [17] Rino, Ardhian, Nugroho, Noni, Srijati, Kusumawati, Okki, C., Ambarwati. (2018). Students Perception on the Use of Computer Based Test. 306(1)
- [18] Ricketts, C., S., J., Wilks. (2002). Improving Student Performance Through Computer-based Assessment: Insights from recent research. *Assessment & Evaluation in Higher Education*, 27(5):475-479. Rosdiana, Rosdiana. (2018). Teknologi Pembelajaran Berbasis ICT (Penerapan Computer Based Test
- [19] Sugiyono, Sugiyono., Sutarman, Sutarman., Tri, Rochmadi. (2019). Pengembangan sistem computer based test (cbt) tingkat sekolah.
- [20] Sarjiyus Omega (2018) Using CBT system for the conduct of GST Examination in Adamawa State University (ADSU), *American Journal of Engineering Research* 7(1), 190-201
- [21] Ubulom & Kelechi Da-Kaladokubo Wokocha (2017) Readiness and Acceptability of Computer-Based Test (CBT) for Post-University Matriculation Examinations (PUME) among Urban and Rural Senior Secondary School Students in Rivers State *International Journal of Innovative Social & Science Education Research* 5(3):51-60.
- [22] Yahya Hakami, Abdul Razak Che Husin, Sakirin Tam (2014) A CBT Framework for Secondary schools of Saudi Arabia
- [23] Zhang, Xiaoyi. (2015). Students' performance data analysis system and analysis method for the students' performance data analysis system.

