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EVALUATION OF THE EFFECTIVENESS OF COMPUTERIZED TESTING TO CURB MISCONDUCT IN THE UNIFIED TERTIARY MATRICULATION EXAMINATION IN NIGERIA

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Abstract

Advancement in technology has made possible the redesigning of modes of testing to suit the 21st-century assessment which measures diverse skills more accurately. Computerised testing, also known as a computer-based test, is a test deployed through the internet or a local area network and scored electronically. The problem of examination misconduct in our educational institutions has put the nation at risk of achieving higher academic standards and portends adverse consequences for UTME as a yardstick for admission into tertiary institutions in Nigeria. Computerised testing has become a necessary intervention to assist in curbing examination misconduct. The study investigates the effectiveness of computerised tests in curbing examination misconduct in the UTME between 2014 and 2023 in Nigeria. The study sought to evaluate the deployment of computerised tests to ascertain their effectiveness in curbing examination misconduct in the UTME between 2014 and 2023 in Nigeria. Three research questions and hypotheses are used to guide the study. The study adopted an ex-post-facto research design. The population of the study was 16,503,116 candidates, and a sample of 57,994 was selected using purposive sampling. The study used percentages to answer research questions and the chi-square test to test the hypotheses at the 0.05 level of significance. The result revealed that computer testing is an effective method of curbing examination misconduct in academic institutions in Nigeria. The study recommended, among others, that enough resources should be directed towards realisation of the potentials of computerised tests in all public and private examinations to eliminate all forms of examination misconduct in Nigeria.

Keywords: Evaluation, computerized test, examination misconduct, UTME,

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Introduction

Education is the most potent weapon humans need for survival; therefore, to grow educationally, the former way of assessment in education needed to be changed. That is, by redesigning the mode of testing. Evaluating the effectiveness of a computerised test is to pass judgement on the worthiness of the measure for the purpose of decision-making. Evaluation in education is therefore regarded as the systematic assessment of the design, implementation or results of an initiative for the purposes of ascertaining the effectiveness of learning outcomes and promoting evaluation processes expected to be as efficient and unbiased a decision (Okoye & Duru, 2020). In Nigeria, there are many external assessment agencies such as the Joint Admissions and Matriculation Board (JAMB), West African Examination Council (WAEC), National Examination (NECO), National Teachers' Institute (NTI) and other educational institutions of government that conduct examinations year in year out. JAMB conducts a selection examination known as the Unified Tertiary Matriculation Examination (UTME) to place suitably qualified candidates into tertiary institutions in Nigeria. However, the challenge has been examination misconduct. The Board understands that examination misconduct is a serious problem that would affect the worthiness of the UTME as an instrument par excellence for measuring admission standards and opted for computer-based testing (CBT) to curb examination misconduct.

The paper-and-pencil form of testing has been the most popular form of testing all over the world. However, most countries are moving away because it is fraught with cumbersome data and various forms of infractions ranging from snatching of question papers and running to nearby bushes to solve for their clients, also known as 'mercenaries', to smuggling prepared answers into the examination hall; swapping of examination papers; copying and spying; possession of mobile phones and similar electronic devices; collusion; impersonation; and unruly/violent behaviour. However, since conversation of any sort is grossly unacceptable during examination, measures taken must deviate from the previous traditional method of assessment. Some UTME candidates and their parents go as far as soliciting for favours from examiners after the examination with respect to the subjects they have been tested on. Some candidates ask JAMB officials for inflation of scores in the Unified Tertiary Matriculation Examination (Udim, Abubakar & Essien, 2018).

Computerised testing, also referred to as computer-based testing, is now a household name in admissions tests throughout the United States, Canada and most advanced countries globally. The mode of testing is important because it measures diverse skills or sets of knowledge in order to provide new and better information about students' abilities. A computerised test has several attributes, such as quick release of results, rescheduling, measurement of skills, being paperless, easy scoring and reporting, and the administrator does not require any special

skills. There are two types of computerised tests – linear and adaptive.

Computerised testing has advantages. Ojerinde (2015) itemises below numerous advantages of e-testing:

- I. better delivery of test items that have been standardized and defined according to their relevant item characteristics (instructional level/objectives, difficulty level, discrimination level and functionality of distracters)
- II. well-organized test administration and ease of scoring of tests
- III. enhanced test security, resulting from electronic transmission and encryption for total eradication of examination breaches
- IV. impartial test administration and scoring reporting
- V. improved awareness of computer by the candidates
- VI. decrease in the wave of examination security breaches
- VII. Significant development in quality and standards of examination.

Byrd (2014) also posited that CBT enables the following:

- I. flexible test scheduling
- II. faster score reporting within hours
- III. enhanced consistency and security of test administration
- IV. eliminates human errors
- V. local and centralized registration and billing systems
- VI. prevents candidates' cheating and manipulation of scores
- VII. it takes up less effort and time for test administrators
- VIII. All data can be stored on a single server.

Other advantages are the following:

- I. Improve productivity and time management in attempting questions.
- II. Creation of parallel forms for equivalent examination.

Oweh (2014), in his report, stated that the Joint Admissions and Matriculations

Board (JAMB) was created and mandated by law to be responsible for the administration of examinations and placement of eligible candidates looking for admission into universities, polytechnics and colleges of education, as the case may be. Therefore, for the conduct to be free from the terrifying experience of examination misconduct, the idea of test administration by means of technology environments was nurtured because candidates that sat for public examinations devised several evil methods of subverting the process of examination.

In Nigeria, before the board opted for CBT in large-scale testing, hitherto, private organisations were conducting recruitment tests through computerised testing. Tertiary education has become a great beneficiary of the computer-based test because results are received faster than those from paper-based tests, and the data obtained from the results enable these institutions to make informed admissions decisions more quickly (<https://www.internationalstudent.com>). Okoye & Duru (2020) asserted that computerised tests to a certain extent curb examination misconduct among UTME candidates. Therefore, continuous use of computerised tests with innovations would efficiently and effectively checkmate all forms of infractions in the UTME.

The quality of any examination is judged by the level of decision accuracy and decision consistency that is achieved. All educative decisions are based directly on the quality and size of the scores that accrue from the educational process. These can be validly defined and sustained through the use of valid scores (Nenty as cited in JAMB, Vital Issues, 2016). A test is an objective and standardised measure of behaviour. In psychology, there is no known method of measuring behaviour that is more objective than the test. Educational tests, therefore, could be an objective and standardised instrument educational experts craft for the purpose of measuring the behaviour of learners. It is also regarded as a systematic method adopted to measure human behaviour to determine the degree of knowledge, skills, aptitude and personality (Adom, Mensah & Dake, 2020).

Evaluation is basically carried out to ascertain the extent to which the programme has been smoothly run to establish the concept at the onset. In addition, evaluation is required to determine the weakness and strength of the present programme to achieve a maximum result. For example, the Strength, Weakness, Opportunities and Threats (SWOT) analysis organisations adopt to help in sound decision-making (Gopal, 2014). For this reason, an evaluator must have an outline of what is to be evaluated and the target to achieve after successfully going over an evaluation. At the first stage, the evaluator must determine the focus of the project to be evaluated and the design to be used and categorise difficulties and prospects that might arise. Hence, the evaluation of the effectiveness of computerised tests in curbing examination misconduct.

Literature has shown that there are several attempts at taming the tide of examination misconduct nationally and at the global stage. Ojerinde (2015) asserted that the Joint Admissions and Matriculation Board has adopted a guiding principle that would henceforth stand in the way of any candidate intending to be involved in examination irregularities. Hopefully, any candidate caught would be handed over to security for examination misconduct committed and severely punished to serve as a deterrent to other candidates that may be nursing the idea to perpetuate such an evil act. However, with the advent of computerised tests, we shall be singing a new song. We have less or no worry at all over examination misconduct.

Examination misconduct has grave implications for society. For example, the Examination Malpractice Act, as cited in Ajayi (2021), stated that examination misconduct undermines the validity, authenticity, reliability and integrity of certificates issued by the education system. Onyecheze (as cited in Ajayi, 2021) states that the effect of examination misconduct has been shown in the miscarriage of justice, mind-boggling looting of the public treasury, electoral fraud, incessant collapse of buildings, fake drug manufacturing and sales, fraud at banks and other organised private sectors and sales of marks/grades in schools and falsification of school records.

With the advancement in computer technology and psychometric theories, there has been accelerated transformation in the design and utilisation of test formats due to numerous advantages offered by the computerised test to members of the community over and above the traditional mode of testing. Various standardised tests of late depend on Computer-Based Tests (CBT) owing to their operational benefits such as test security, easy recording of results, instant feedback, scoring and recording of response time (RT) information on items (Jia, Zhang & Zhu, 2019). Response times give accurate time not only on the candidates' ability and response behaviour but also on the test characteristics as well. CBT benefits both the candidate and the organisation conducting the examination, as it provides an opportunity for recording scores easily and immediate feedback. In another form of CBT, the Computerised Adaptive Testing (CAT), the difficulty level is adapted to candidates' response behaviours, making it more accurate in response time recording.

Research has shown the effectiveness of computer testing in minimising examination misconduct over the years. For instance, Oghate (2023) asserted that the effectiveness of computer-based testing in curbing examination malpractice with computer-based testing has been very effective. Leonard, Inikpi and Edegbo (2019) investigated innovations in curbing examination insecurity in public schools in the East Education Zone of Kogi State, and the result revealed that management of examination insecurity was effectively checked with the

use of CCTV cameras, biometric capturing, adoption of CBT, prohibition of use of phones and similar electronic devices as innovative strategies for curbing examination insecurity in Kogi East. Nwoke, Osuji and Agi (2017) investigated the influence of computer-based test (CBT) on examination misconduct in public examinations, and the study revealed that computer-based test is effective in reducing examination misconduct in public examinations. Ojerinde, Okwonkwo-Uwandulu, Ariyo and Anyaegbu (2016) carried out an investigation on the role of technology in curbing breaches on examination security among unified tertiary matriculation examination (UTME) candidates in Nigeria, and the result revealed that the introduction of technology in the conduct of UTME has drastically reduced various forms of examination malpractice and other security breaches as against the conventional method of testing. Ojerinde, Anyeagbu, Onoja and Adelokun (2016) investigated the impact of e-testing on examination security: A case study of the Unified Tertiary Matriculation Examination (UTME) and its result revealed that there was a drastic reduction in all forms of examination misconduct.

The problem of examination misconduct at any level of educational institutions has put nations at risk of achieving the desired objectives of higher education and portends adverse consequences on the validity, reliability and usability of tests and, in most cases, casts an aspersion on the scores obtained from the Nigerian education system. Examination misconduct is a serious academic ill in the Nigerian education system. This is especially among the Unified Tertiary Matriculation Examination (UTME) candidates, which is a disturbing trend to the board and management in the evaluation of the quality of candidates to be admitted into tertiary institutions in Nigeria. As educators embrace the innovation presented by technology in assessment as a panacea for curbing examination misconduct and increasing students' achievement, computerised testing or computer-based test cannot be ignored. Despite efforts by the JAMB management to put in place measures to curb examination misconduct, many UTME candidates still devise new methods of cheating on a yearly basis. As these infractions were becoming intractable, the Joint Admissions and Matriculation Board (JAMB) opted for computerised testing in assessment to curb the menace of examination misconduct facing the Unified Tertiary Matriculation Examination (UTME).

Research Questions

The following research question will guide the study:

1. To what extent does a computerised test curb candidates' impersonation in the Unified Tertiary Matriculation Examination (UTME) between 2012 and 2021 in Nigeria?
2. How will computerised tests be effective in curbing candidates' unruly/violent behaviour in the Unified Tertiary Matriculation Examination (UTME) between 2012

and 2021 in Nigeria?

3. To what extent does computerized-test curb candidates' examination misconducts in the Unified Tertiary Matriculation Examination (UTME) between 2012 and 2021 in Nigeria?

Hypotheses

1. Computerised tests do not significantly curb candidates' impersonation in the Unified Tertiary Matriculation Examination (UTME) between 2012 and 2021 in Nigeria.
2. Computerised tests do not significantly curb candidates' unruly/violent examination misconducts in the Unified Tertiary Matriculation Examination (UTME) between 2012 and 2021 in Nigeria.
3. Computerised tests do not significantly curb candidates' examination misconducts in the Unified Tertiary Matriculation Examination (UTME) between 2012 and 2021 in Nigeria

Methods

The study adopted an ex-post-facto research design. The population of the study was 16,503,116 candidates, and a sample of 57,994 was selected using purposive sampling. The instrument for data collection was the format developed by the researcher, called the Examination Misconduct Format (EMF). The instrument was subjected to validation by experts in Educational

Measurement and Evaluation had a content validity index of 0.80. The reliability coefficient of

0.85 was obtained. Percentages were used to answer the research question, and Chi-square was used to test the hypothesis at the 0.05 level of significance.

Results

Question 1: To what extent does computerized-test curb candidates' impersonation in the Unified Tertiary Matriculation Examination (UTME).

Table 1

Percentages of Total Exams Misconducts and Impersonation

Year	Total Exams misconduct	impersonation	Percentage
2012	7725	1198	15.5
2013	12691	3325	26.2
2014	12210	2360	19.3
2015	2581	625	24.2
2016	3462	848	24.5
2017	2508	1276	50.9
2018	280	44	15.7
2019	16250	110	0.7
2020	195	39	20.0
2021	92	22	23.9
	57994	9847	17.0

Table 1 depicted the percentages of students involved in impersonation from the total number of candidates recorded for examination misconducts between 2012 and 2021. The percentages indicated that there are irregular reductions in cases of impersonation, and it accounts for 17.0% of the total examination misconducts recorded over the years.

Question 2: How will computerized-test be effective in curbing unruly/violent behaviour of candidates in the Unified Tertiary Matriculation Examination (UTME)?

Table 2: Percentages of Total Exams Misconducts and Unruly/violet Behaviours

Years	Total Exam Misconduct	Unruly/violent behaviours	percentages
2012	7725	1097	14.2
2013	12691	2470	19.5
2014	12210	3268	26.8
2015	2581	800	31
2016	3462	1037	30.0
2017	2508	934	37.3
2018	280	62	22.1
2019	16250	70	0.4
2020	195	42	21.5
2021	92	16	17.4
	57994	9796	16.9

Table 2 displays the percentages of involvement in unruly/violent behaviours during UTME between 2012 and 2021. The result showed that there was no stable reduction in the act of unruly/violent behaviours during UTME, and it accounted for 16.9% of the total cases of examination misconduct over the years.

Research Question 3: To what extent does computerised testing curb candidates' examination misconduct in the Unified Tertiary Matriculation Examination (UTME) between 2012 and 2021?

Table 3

Percentages of Cases of UTME Examination Misconduct Between 2012 and 2021

YEAR	Total Applicants	Cases Misconduct	Exam percentages
2012	1503933	7725	0.51
2013	1735810	12691	0.73
2014	1632172	12210	0.75
2015	1475600	2581	0.17
2016	1592462	3462	0.22
2017	1722236	2508	0.15
2018	1653127	280	0.02
2019	1886509	351	0.01
2020	1949983	195	0.01
2021	1351284	92	0.01
Total	16,503,116	58,600	0.36

From Table 3, the percentages of examination misconducts reduce significantly from 2015 down to 2021 with computer-based testing.

Hypothesis testing

Hypothesis One: Computerised tests do not significantly curb candidates' impersonation in the Unified Tertiary Matriculation Examination (UTME) between 2012 and 2021 in Nigeria.

Table 4

Chi-Square Tests of Total Exams Misconducts and Impersonation

	Value	df	Asymptotic sided)	Significance (2-sided)
Pearson Chi-Square	90.000 ^a	81	0.231	
Likelihood Ratio	46.052	81	0.999	
Linear-by-Linear Association	2.581	1	0.108	

a. 100 cells (100.0%) have an expected count less than 5. The minimum expected count is .10.

From Table 4, the value of chi-square was 90.000 and the p-value was 0.231, which is greater than the 0.05 level of significance; therefore, the null hypothesis was rejected. This implies that computer-based testing curbs impersonation significantly.

Hypothesis Two: Computerised tests do not significantly curb candidates' unruly/violent examination misconducts in the Unified Tertiary Matriculation Examination (UTME) between 2012 and 2021 in Nigeria.

Table 5

Chi-Square Tests of Total Exams Misconducts and Unruly/Violent Behaviours

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	90.000 ^a	81	0.231
Likelihood Ratio	46.052	81	0.999
Linear-by-Linear Association	2.507	1	0.113
N of Valid Cases	10		

a. 100 cells (100.0%) have an expected count less than 5. The minimum expected count is .10.

Table 5 depicted the value of chi-square to be 90.000 and the p-value 0.231, which is greater than the 0.05 level of significance; therefore, the null hypothesis was rejected. That means computer-based testing curbs unruly/violent behaviour significantly.

Hypothesis Three: Computerised tests do not significantly curb candidates' examination misconducts in the Unified Tertiary Matriculation Examination (UTME) between 2012 and 2021. **Table 6**

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	90.000	81	0.231
Likelihood Ratio	46.052	81	0.999
Linear-by-Linear Association	0.929	1	0.335
N of Valid Cases	10		

a. 100 cells (100.0%) have an expected count less than 5. The minimum expected count is .10.

Table 6 shows a p-value of 0.231, which is greater than the 0.05 level of significance; therefore, the hypothesis is rejected. Thus, computerised tests significantly curb candidates' examination misconducts in the Unified Tertiary Matriculation Examination (UTME) between 2012 and 2021.

Discussion of Results

The result of hypothesis one on Table 4 shows that computerised tests significantly curb impersonation, agreeing with Ojerinde, Okwonkwo-Uwandulu, Ariyo and Anyaegbu (2016), whose research revealed that the introduction of technology in the conduct of UTME has reduced drastically various forms of examination malpractice and other security breaches as against the conventional method of testing. Again, the result also agreed with Leonard, Inikpi and Edegbo

(2019) who investigated Innovations in Curbing Examination Insecurity in Public Schools in the East Education Zone of Kogi State, and the result revealed that the management of insecurity could be effectively checked with the use of CCTV cameras, biometric capturing, adoption of CBT, prohibition of the use of phones and similar electronic devices were the innovative strategies adopted to curb examination insecurity in Kogi East.

The result of hypothesis two agreed with Ojerinde, Anyeagbu, Onoja and Adhlakun (2016), who investigated the impact of e-testing on examination security: A case study of the Unified Tertiary Matriculation Examination (UTME) and its result revealed that there was a drastic reduction in all forms of examination misconduct. Again, the result agreed with Nwoke, Osuji and Agi (2017) who investigated the influence of computer-based test (CBT) on examination misconduct in public examinations, and the study revealed that computer-based tests are effective in reducing examination misconduct in public examinations.

The result of hypothesis three, which revealed that computerised tests significantly curb candidates' examination misconducts in the Unified Tertiary Matriculation Examination (UTME) between 2012 and 2021, significantly agreed with Oghate (2023), who investigated the effectiveness of computer-based testing in curbing examination malpractice among undergraduates in Adekunle Ajasin University, Akungba Akoko, Ondo State, and the result revealed that computer-based testing is effective in curbing examination malpractice. In addition, the result agreed with Ojerinde, Anyeagbu, Onoja and Adhlakun (2016), who investigated the impact of e-testing on examination security: a case study of the Unified Tertiary Matriculation Examination (UTME), and the result revealed that there was a drastic reduction in all forms of examination misconduct.

Conclusion

Based on the findings of the study, it can be concluded that the use of computerised tests has the capability to curb impersonation, reduce cases of unruly/violent behaviours and effectively curb examination misconduct in the Unified Tertiary Matriculation Examination in Nigeria.

Recommendations

From the findings, the paper recommended as follows:

- That since computerised tests have been a wonderful technology in curbing examination misconduct, all educational institutions should adopt it to eliminate this cancer worm in our education system.
- Since computerised tests have curbed impersonation, all examination bodies should adopt the mode of testing to checkmate hired ‘mercenaries’ recruited to sit for examinations instead of the bonafide candidates.
- Since computerised tests are effective in curbing testing agencies already deploying test through CBT, they should integrate Aberrant Response Time (ART) expertise to accurately track and capture data on candidates’ ability and behaviour characteristics as well.
- Enough resources should be geared toward ensuring that computerised tests are utilised to eliminate examination misconduct in both public, professional and private testing bodies.

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