

Undergraduates' Views and Attitudes Towards the Use of Computer-Based Tests for Examination at the University of Lagos, Nigeria

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Abstract

This study examined the perception and attitude of undergraduate students towards the use of the computer-based test (CBT) for examination at the University of Lagos. The researcher formulated and tested four research hypotheses to direct the study's findings. The Descriptive Survey Research Method was used to sample two hundred (200) undergraduate students at the University of Lagos. The sample comprised 88 male and 112 female 300 level students randomly selected from four different faculties (Education, Science, Social Sciences and Arts). Data was collected using a structured questionnaire with a reliability coefficient of 0.76 when tested on the pilot study. Simple percentage and frequency counts were used to analyse the demographic data. The independent t-test statistical tool tested the hypotheses at 0.05 level of significance hypotheses. Findings from the study showed that 1) there is no significant gender difference in the views and attitudes of undergraduates towards the use of CBT for examination in the University of Lagos, 2) there is a perceived significant impact of CBT on the performance of undergraduate students in the University of Lagos, 3) there are significant problems associated with the use of CBT for examination in the University of Lagos. According to the above findings, the study recommends that the university's examination board should consistently adopt the CBT techniques in examination and increase the degree of transparency in the presentation of exam results, as it extends the examination duration for calculation-based courses. Additionally, the test developer should formulate more CBTs than the traditional paper and pencil tests.

Keywords: *Computer-Based Test (CBT), Information Communication and Technology (ICT), Perceived Impact, Students' Performance, View, Attitude*

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Background to the Study

Technology plays a critical role in various aspects of today's lives, such as education, marketing, transportation, and medical examinations. Multiple people from all works of life use Technology (IT) in different fields to practice their professions and duties. In addition, diverse educational institutions use IT for training and examinations—for example, e-curricula, smart boards and computer-based models. Several factors contribute to the increased usage of ICT techniques in academic institutions, particularly for assessing the students' learning, knowledge and skills. ICT is used to provide evidence of the student's achievement level.

In the past decade, ICT has significantly influenced assessing students' performance. In academics, CBT is increasingly used in educational measurements and evaluations. Computer-based tests (CBT) are administered through computers as multiple-choice questions (MCQs) as stand-alone or dedicated networks or through other technological devices connected to the internet. Computer-based tests have been applied in testing students' knowledge and problem-solving skills since the 1960s. It helps educators and trainers to deliver, schedule, author, and report surveys, quizzes, tests and exams. There are two main types of computer-based testing. The most familiar type is where candidates fill in their responses on paper and enter them into a computer optical mark reader. The computer reads and scores the data entered and reports test reliability. The second type of CBT involves the provision of an assessment interface for students to input their answers and receive feedback through a computer (Jimoh, Abduljaleel, and Kawu, 2016). Computer-based test (CBT) is an essential qualitative shift from the traditional paper-pencil-based test, not just an alternative method of delivering examinations. CBTs are not intrinsically better than paper-pencil despite the advantages associated with their administration.

According to previous studies, the testing format does not affect test scores; hence CBT is a valid and reliable method for testing (Jimoh, AbdulJaleel, and Kawu, 2016). In addition, CBT is used for summative assessment and to establish whether the computer-based testing performance was comparable to paper-based evaluations. In higher educational institutions, different examination techniques assessed students' academic achievements and progress, such as presentations, projects, assignments, pen-and-paper based examinations, etc. Levy and Ramim (2017) identified more than fifty varied techniques used in higher education for assessments; CBTs are most commonly used. However, the rapid improvement of ICT techniques in teaching and learning has changed the paradigm and shown that CBTs and paper-based tests will not produce similar reports even with identical items. Therefore, the paradigm has shifted from paper-pencil based tests to computer-based systems of examination, also termed Computer Assisted Testing (CAT), Computerized Assessment (CA), Computer-Aided Assessment (CAA), Computer Based Test (CBT), Computer Based Assessment (CBA), Online Assessment, E-Assessment and Web-Based Assessment.

The computer is an integral part of delivering question papers in computer-based examinations. It stores and marks students' responses and report the tests' results. Zhao (2016) defined CBT as using computers for assessing students' learning. Consequently, with the

introduction of ICTs in education, it is vital to reconsider, rethink and change the traditional examination methods. Electronic assessment tools such as CBTs help reduce the stress of conducting examinations and facilitate students' assessments. Computer-based examinations promote effective learning by testing a range of skills, knowledge and understanding. Accessing and managing students' data and developing communication skills is easy and possible to do online with CBTs but not with regular paper-pencil and essay-based examinations. The critical determinant of a good assessment is whether the assessment task is relevant to the intended learning outcomes for the course, not forgetting the attitudes and tested skills.

Students' attitude is an essential variable in the learning process; therefore, research studies investigating undergraduate students' attitudes towards computer-based tests are necessary. Recently, the University of Lagos introduced using computers for writing tests and examinations; hence knowing the views and attitudes of the undergraduate students towards this technique of tests and quizzes is needed for the university to improve its method of delivering examinations. Generally, most students are computer savvy and likely choose computer-based tests and activities such as reading online books over traditional paper-pencil tests and exercises. However, very few research studies have investigated the view and attitude of undergraduate students towards computer-based tests and assessments, particularly in Nigerian universities. Therefore, this present study examined the opinions and attitudes of undergraduate students at the University of Lagos.

Statement of the Problem

Customarily, in Nigeria, students are assessed with paper-pencil techniques on cognitive abilities. However, examination malpractice characterises the paper-pencil assessment method. It threatens the validity of the examination outcomes, resulting in various examination bodies adopting other forms of delivering examinations to the students. One of the techniques adopted is Computer-based Tests (CBTs), and the University of Lagos, along with other tertiary institutions, implement CBTs in updating the students' knowledge. Nevertheless, the adoption of CBTs has faced many challenges and has varying opinions among examiners and students. Various literature has reported different views on the use of CBTs; some studies emphasise students' complaints on their inability to return to rework problems. However, students have also noted that it is easier and quicker to read questions set on paper than reading from the computer screen.

Computers can hang or crash while students take a test or examinations. Additionally, some students lack prior knowledge of using laptops; hence, their views and attitudes towards CBT are already preempted. Similarly, some teachers also have challenges handling a computer system; they lack the competence and ability to navigate tests and set examinations with a computer. Finally, the computer system can develop faults without prior notice, thereby voiding students' efforts during lectures and quizzes.

This study is justified by students' and teachers' conflicting views and opinions concerning CBTs in examinations. All these are problems necessitating an investigation of students' varied ideas and attitudes towards CBT. Nevertheless, the importance of CBT in educational

assessment is recognised globally, and it includes reduced administrative costs, saves time and puts less demand and effort from the teachers or examiners. Based on these findings, this study investigated the views and attitudes of undergraduate students towards the adoption of CBT techniques in assessing students' academic performance.

Purpose of the Study

1. To examine undergraduates' views towards CBT for examination at the University of Lagos. Determine undergraduates' attitudes towards the use of CBT for delivering quizzes and tests at the University of Lagos.
2. To examine the perceived impact of CBT on undergraduate students' performance at the University of Lagos.
3. To investigate the problems associated with the computer-based test for examination at the University of Lagos.

Research Hypotheses

The study tested the following null hypotheses:

1. There is no significant gender difference in the views of undergraduates towards the use of CBT for examination at the University of Lagos
2. There is no significant gender difference in the attitudes of undergraduates towards the use of CBT for examination at the University of Lagos
3. There is no significant perceived impact of CBT on undergraduate students' performance at the University of Lagos.
4. There are no significant problems associated with the computer-based test for examination at the University of Lagos.

Methodology

The study adopted a descriptive survey method for collection, organisation, and data analysis. The justification for its use lies in the research variables needed to collect all data from participants at once. The study's target population comprised all undergraduate students in the twelve faculties, while the study sample was two hundred (200), undergraduates from four faculties. The researcher used a random sampling technique to select four out of them. They were Faculties of Education, Science, Social Sciences and Arts.

Furthermore, fifty (50) undergraduates from each faculty were selected. The sample consisted of males and females 300 level undergraduate students chosen through the simple random sampling technique. By this, every undergraduate in the selected faculties had an equal chance of being selected. The researcher decided on 300 level undergraduate students because they had spent at least two years in the school system and could give more valid opinions on questions regarding undergraduate students in the university. The instrument used in the study to collect data from the respondents was a researcher-made questionnaire titled "Views and Attitudes of Computer Based Test for Examination Questionnaire (VACBTEQ)".

The research instrument had two significant sections, 'A' and 'B'. Section 'A' contained the biodata of the respondents such as gender, age and faculty. In contrast, Section 'B' dealt explicitly with the questions concerned with the subject under investigation, which enabled the researcher to test the formulated hypotheses. Each statement in Section B had four options tasks under the Likert scale 'Strongly Agreed', 'Agreed', 'Disagreed' and 'Strongly Disagreed'. The respondents responded to the items by ticking the option they think is the correct response for each statement based on their feelings or opinions.

For the instrument's reliability, a pilot survey was conducted on 20 undergraduate students in another faculty not included in the main study, specifically from the Faculty of Engineering. Cronbach's Alpha reliability analysis was employed with the aid of Statistical Package for Social Sciences (SPSS) to determine the reliability coefficient of the research instrument. The choice of this method is because it measures the internal consistency of the items on the research instrument. In Cronbach's Alpha reliability analysis, the closer Cronbach's Alpha to 1.0, the higher the internal consistency reliability. However, the coefficient was found to be an average of 0.76 of all the items tested. Therefore, it was concluded that the instrument was reliable for the study and acceptable since the overall average alpha coefficient is 0.76. This confirms the reliability, stability and internal consistency of the data employed for this study with a Cronbach alpha of 76%.

The researcher administered the questionnaire to the respondents in the various faculties and departments. The questionnaires were filled at the administration time and collected immediately upon completion, ensuring a 100% return rate. After that, the administered questionnaires were collated for the analysis of data. Descriptive statistics such as the percentage and frequency counts were used to analyse the respondents' biodata. Furthermore, the hypotheses formulated in this study were analysed using the independent t-test statistical tool at a 0.05 level of significance.

Results

Hypothesis One: This hypothesis in the null form states that there is no significant gender difference in undergraduates' views towards the use of CBT for examination at the University of Lagos.

Table 1: Gender difference in the views of undergraduates towards the use of CBT for examination in the University of Lagos

Gender	N	X	SD	Df	t-cal	t-crit	Remark
Male	88	31.74	3.82	198	1.39	1.98	H ₀ 1 Accepted
Female	112	29.09	3.19				

From the analysis presented in table 1, the t-calculated (t-cal=1.39) is lesser than the t-critical (t-crit=1.98) given 198 degrees of freedom at a 0.05 level of significance. Therefore, as a result of the above interpretation, the null hypothesis, which states that there is no significant gender difference in undergraduates' views towards CBT for examination at the University of Lagos, was accepted.

Hypothesis Two: This hypothesis in the null form states that there is no significant gender difference in the attitudes of undergraduates towards the use of CBT for examination at the University of Lagos

Table 2: Gender difference in the attitudes of undergraduates towards the use of CBT for examination in the University of Lagos

Gender	N	X	SD	Df	t-cal	t-crit	Remark
Male	88	30.17	3.41	198	1.42	1.98	H ₀ 2 Accepted
Female	112	29.21	3.63				

From the analysis presented in table 2, the t-calculated (t-cal=1.42) is lesser than the t-critical (t-crit=1.98) given 198 degrees of freedom at a 0.05 level of significance. Therefore, as a result of the above interpretation, the null hypothesis, which states that there is no significant gender difference in undergraduates' attitudes towards CBT for examination in the University of Lagos, was accepted.

Hypothesis Three: This hypothesis in the null form states no significant perceived impact of CBT on undergraduate students' performance at the University of Lagos.

Table 3: Perceived impact of CBT on undergraduate students' performance in the University of Lagos

CBT	N	X	STD	Df	t-cal	t-crit	Remark
High	136	29.35	3.92	198	3.64	1.98	H ₀ 3 Rejected
Low	64	23.89	2.28				

From the analysis presented in table 3, the t-calculated (t-cal=3.64) is significantly higher than the t-critical (t-crit=1.98), given 198 degrees of freedom at a 0.05 level of significance. As a result of the above interpretation, the null hypothesis, which states no significant perceived impact of CBT on the undergraduate students' University of Lagos, was rejected. At the same time, the researcher upheld the alternative hypothesis that states a significant perceived impact of CBT on undergraduate students' performance at the University of Lagos.

Hypothesis Four: This hypothesis in the null form states that there are no significant problems associated with the computer-based test for examination at the University of Lagos.

Table 4: Problems associated with the computer-based test for examination in the University of Lagos

Problems in the Performance	N	X	STD	Df	t-cal	t-crit	Remark
High	72	26.76	3.02	198	5.31	1.98	
Low	128	28.91	2.89				H ₀ 4 Rejected

From the analysis presented in table 4, the t-calculated ($t_{\text{cal}}=5.31$) is significantly higher than the t-critical ($t_{\text{crit}}=1.98$), given 198 degrees of freedom at a 0.05 level of significance. Therefore, as a result of the above interpretation, the null hypothesis, which states that there are no significant problems associated with the computer-based test for examination in the University of Lagos, was rejected. At the same time, the researcher upheld the alternative hypothesis that there are significant problems associated with the computer-based test for examination at the University of Lagos.

Discussion of Findings

Hypothesis One-The result of the **hypothesis one** finding revealed no significant gender difference in undergraduates' views towards CBT for examination at the University of Lagos. This finding supports Ricketts and Wilks (2014); they reported no significant difference exists in Undergraduates' Views towards the Use of CBT for Examinations regarding gender, stream of study and programme of study. Also, according to Sonntag, Sinacore and McNulty (2016), access to ICT is crucial for boys and girls to participate in society on equal terms with men and boys. Furthermore, there is a growing recognition of the need to talk about human rights in general and women's rights in particular as being relevant offline and online. Chin (2014) also reported that gender differences in the undergraduates' view towards CBT, competitiveness, and computer familiarity were not related to this performance difference, though content familiarity. Therefore, they show no significant gender difference in undergraduates' views towards CBT for Examinations.

Similarly, Greaud and Green (2016), found that gender does not affect students' perception of CBT, and as such, CBT can be considered a valid and acceptable testing mode. Wilson, Genco and Yager (2015) also reported no significant gender differences among the students on the post achievement tests and perception of CBT scales favouring the experimental group. Furthermore, Wingenbach (2015), opined that most undergraduates, irrespective of gender, have recently adapted e-tests rather than conventional assessment methods.

Hypothesis Two-The result of the hypothesis two findings revealed no significant gender difference in undergraduates' attitudes towards the use of CBT for examination at the University of Lagos. This finding collaborates with Obioma (2013), who found no significant association between academic achievement and students' attitudes towards computers, computing anxiety levels, electronic exams, or gender. Also, Johnson (2019) reported that both genders have positive attitudes towards CBTs. Additionally, they state that the attitudes of males and females towards CBTs are under the influence of the social environment; the boys focus on the usefulness while the girls stress the ease of use. This is also in line with Durojaye and Emmanuel's (2015) submission that gender does not significantly influence students' views and attitudes towards computer-based testing/examination.

Furthermore, Ilesanmi and Lasisi (2015), revealed no significant difference in the perspective of male and female students in JAMB toward CBT in Kaduna state. Similarly, Wibowo (2016), reported that numerous private and public educational institutions presently adopt male and female students in Egypt that they are effective means for (a) providing instant

feedback to students and (b) minimizing the load on over-stretched academic staff. This shows that e-tests efficiently reduce the workload on examination systems, thus minimizing a load of teachers, irrespective of e-test taker's gender.

Hypothesis Three-The hypothesis three findings revealed a significant perceived impact of CBT on undergraduate students' performance at the University of Lagos. This finding supports the position of Ricketts and Wilks (2014). They reported that one of the benefits of computer-based assessment is improving student performance in summative assessments. Researchers have always argued that cognitive differences could affect students' performance on computers. Wilson, Genco and Yager (2015) reported knowledge differences in how someone takes computer-based and paper and pencil tests, respectively. The skills and attitudes or behaviour for using the computer and computer response could affect the cognitive working of the learner.

Given that computer nervousness could influence one's performance adversely, this variable aggravated the score difference between CBT and PPT (Chin, 2014). Gary (2018) supports the contention that integrated, well-designed online formative assessments can significantly positively affect learning. Web-based formative assessments also support equity and inclusiveness by allowing students to attempt each evaluation anonymously on multiple occasions at any time. According to Karadeniz (2015), students exhibited a positive attitude towards web and mobile-based assessment because of the ease of use and the comprehensive instant feedback. Moreover, the most favoured tests were web-based, and the least was paper-based.

The result of the findings of hypothesis four revealed significant problems associated with the computer-based test for examination at the University of Lagos. This finding is in line with Fagbola's (2013), submission that several challenges militate against the full selection of CBT in Nigeria and other developing countries; these include inadequate ICT infrastructures such as hardware, software and bandwidth accessibility. Also, Adebayo and Abubakar (2014), reported that CBT adoption in Nigeria faces ten critical challenges: economic factors, security, Software; Poor ICT culture, policy and implementation; and power failure. Adegun, Akinola, Adepoju and Kolajo (2018) also reported mistakes in question and inadequate time were among the students' challenges CBE mode of assessment. Adegun et al. (2018), also showed that the problem faced by the students such as logging on, accessing software submission of the answer, editing, security of the system, relatively large number of students meet up with the items listed above and few of them were unable to meet up with the problem. Therefore, it agreed to train students on the use of computer systems.

Additionally, Adomi and Kpangban (2010), reported that about 40% of the African populations live in areas not covered by telecommunication services. Schools in such location will experience ICT connectivity problems. Oye (2011) also noted that during JAMB's online UTME, cases of power failure interrupting the examination abound. Also, Ilesanmi and Lasisi (2015), identified challenges associated with online tests. The comparative study shows that cryptography supports enhanced security control for the online exam process and

authentication and integrity. Therefore, the focus should not be on security breaches perpetrated by skilled personnel. Furthermore, Dreher (2015), asserted that extended testing window, reuse of items-exposure rate, testing environment-CBT lab etc., are factors that could affect testing integrity.

Conclusion

The impact of computer-based examination in Nigeria tertiary institutions cannot be overruled since the study established CBT's roles and immense contributions for instructional purposes in Nigerian universities. The study explored the conceptual meaning of Computer Based Test (CBT), advantages of Computer Based Test and problems of computer-based examinations in Nigeria educational institutions.

By the results of the study, the following conclusions were reached:

1. No significant gender difference exists in the views of undergraduates towards the use of CBT for examination at the University of Lagos
2. No significant gender difference exists in the attitudes of undergraduates towards the use of CBT for examination at the University of Lagos
3. CBT has a significant impact on undergraduate students' performance at the University of Lagos.
4. There are significant problems associated with the computer-based test for examination at the University of Lagos.

Recommendations

The following recommendations follow the conclusions of the study:

1. The study found no significant gender difference in undergraduates' views towards CBT for examination; hence, school management should consistently maintain the CBT technologies, increase transparency in result presentation and a lot more time for calculation-related courses.
2. The result also showed no significant gender difference in undergraduates' attitudes towards the use of CBT for examination; therefore, the test developer should develop the computerised test rather than using the traditional paper and pencil to enter results into a computer.
3. The result also showed that CBT has a significant impact on undergraduate students' performance at the University of Lagos; thus, students should be trained to improve their skills in using computer systems.
4. There should be an improvement on a mistake in question and adequate time as the cause of students' failure with CBE mode of assessment, training and retraining on general use of computer for students before participating in it.

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