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# Impact of Computer-Based Tests on the Quality of Education in Nigeria

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*Abstract: Teachers need to be aware of how switching from paper-based to computer-based tests may affect students' performance as classroom technology expands and teachers become more technologically savvy. When teachers can create computer-based versions of assessments that students use between classrooms and for instructional decisions, this becomes even more critical. The impact of computer-based tests on education quality is the subject of this research. It was expanded under the subheadings listed below: the conceptual meaning of Computer Based Test (CBT), the benefits of CBT in education, the difficulties of computer-based exams in Nigeria, and the prospects of CBT. The conclusion and recommendations were drawn based on the following considerations.*

*Keywords: Computer-Based Test, Paper-Based Test, Education, Assessment, Examination, ICT Infrastructure and Soft-Wares.*

## 1. INTRODUCTION

Knowledge is passed on from one person to another or from one organization to another through education; It could be in a semi-formal, formal, or informal setting.

A student and a teacher are always present. Education is defined as the sum of all the processes by which a person develops abilities, attitudes, and other forms of behavior that are based on practical values in the society in which he or she lives, according to the Dictionary of Education, which was edited by C.V. Good in 1973. the social process by which people are influenced by a particular, controlled environment (especially the school) so that they can become socially competent and grow to their full potential.

The primary goal of providing education to all Nigerians is to give them a solid foundation for living independently. Education has always been regarded as the foundation of national development ever since independence. Since its independence in 1960, Nigeria has worked to expand secondary education, guided by a variety of policy stances over time. However, several educational issues and planning difficulties have been associated with the expansion strategies.



According to Fisman and Roberta (2002), education is one of the largest contributors to national economic performance and human advancement. As a result, it necessitates a greater level of commitment than other development activities. It also requires staff members who are skilled, highly trained, and dedicated, as well as infrastructure, a high-quality curriculum, and sufficient teaching and learning materials.

In Nigeria, for instance, the denial of teachers' rights, the burdensome workload, and the low level of salaries must all be taken into consideration when discussing quality education. This study attempts to investigate this in-depth in this regard. Both sectoral and macroeconomic policies have influenced Nigeria's expansion through the development of high-quality education. Increasing funding for high-quality education must be used efficiently and held accountable, this is a major challenge for the educational sector.

Graduates from education are expected to be able to thrive in a world that is changing quickly, face challenges and solve problems, be entrepreneurs and create jobs, and be critical and active citizens. In Nigeria, secondary education is getting better. The most important achievements in the education sector include an increase in the number of girls and boys enrolling in all levels of education and an increase in the number of teachers and educational institutions.

However, secondary education in Nigeria continues to face numerous obstacles. In Nigerian secondary schools, for instance, the curriculum is overloaded, there is a lack of textbooks and other teaching and learning materials, teachers have low qualifications and poor teaching abilities, teachers are underutilized, there are poor physical facilities, students spend fewer hours on the task, and the community secondary education subsector is underfunded in comparison to other sectors. Based on the set goals, there are several ways to evaluate the student's abilities. These methods include; assignments, tests and projects.

Additionally, students' performance can be evaluated in a variety of ways, some of which include paper and pencil (PPT) tests and computer-based testing (CBT).

One of the most recent educational technology inventories is the Computer Based Test (CBT). It's a method of test organization by which questions are given to students through PC or whatever other electronic means which they answer by filling in the ideal choices or in the space given. According to Sorana-Daniela and Lorentz (2007), CBT is defined as tests or assessments that are administered by a computer in a stand-alone or dedicated network or by other technology devices linked to the internet, most of which are commonly used in multiple-choice questions (MCQs).

Since the 1960s, CBT has been used to test knowledge and problem-solving abilities. Surveys, quizzes, tests, and examinations can now be written, scheduled, given, and reported on by educators and trainers thanks to computer-based assessment systems. Computer-based tests can be divided into two main categories. Firstly, candidates fill out their responses on a paper form that is fed into an optical mark reader on a computer, which is the most common type. This may even report on the test's reliability in addition to reading the form and scoring the paper. Computers serve as an assessment interface for students in the second type of CBT: They use a computer to enter their responses and receive feedback.



### **Computer-Based Test (CBT)**

CBT is one of the most recent innovative approaches to assessments that higher education institutions are most interested in. CBT is hailed as the solution to making institution-level and state-wide assessments more accessible and less expensive. Additionally, some see it as a way to improve accessibility for students with disabilities.

Christine Hui, L.C. (1990) says that the terms "computer-based test" and "computer-classification test" are used interchangeably. They mean administering a test using a computer that is the same length, the content of the items, and order as a traditional PPT.

Both the institutions that administer the assessment programs and the students who take part in them appear to benefit from CBT over PPT. The U.S. Department of Education recognizes these benefits and encourages CBT development through one of its major initiatives, the Race to the Top Assessment Program. According to Becker (2006), advocates of CBT have identified several positive advantages, including efficient administration, student preference, self-selection options for students, improved writing performance, immediate results, efficient item development, increased authenticity, and the potential to shift focus from assessment to instruction. CBT likewise permits better approaches for evaluating instructions. Innovative assessments, for instance, are currently being developed that give students the ability to manipulate data and role-play.

### **The Importance of Evaluation in Education**

All formal education whether e-learning or traditional face-to-face learning is evaluated at the end of the learning period. The term "evaluation," "test," "assessment," or "examination" is used interchangeably to describe the student's level of knowledge acquisition at the end of their learning period. Emaikwu (2012) says that in education, tests are used as part of an evaluation to figure out a student's level of skill acquisition or intellectual competence and comprehension after a certain amount of time. Ojedele & Ilusanya (2006) are cited in the definition of evaluation as a method for determining a system's outcome.

Once more, Joshua (2004) defined evaluation as the systematic gathering of data for evaluating a program, product, procedure, or goal; or the potential value of different strategies designed to achieve specific goals. According to Onuka (2006), there are two main types of evaluation: formative and summative assessments. Formative evaluation is the process of evaluating a program during the program's development or during teaching and learning to help it achieve its goal. After a program, a summative evaluation is conducted. According to Obemeata (2005), which is cited in Ogunlade et al., summative evaluation provides evidence for evaluating a training program's success or failure.

### **Instruments of Assessment in Education**

Assessment of students could be by the customary paper-based test or through a computer-based test. The paper-based test is the most common method of testing students in Nigeria's educational system. In this mode, students respond to questions with a pen and paper. In Nigeria, the paper-based test (PBT) is characterized by a variety of exam malpractices, such as bringing in unauthorized materials, writing on currency notes and identity cards, spying on other candidates in the examination hall, changing exam scores or grades, and substituting answer sheets. Others incorporate; body writing or tattoos, in which students, particularly



females, write on hidden parts of their bodies, impersonation, leaking questions to students before the exam, conspiring with supervisors and school administrators to cheat.(Adebayo and Abubakar, 2014).

According to Mubashrah, Tariq, and Shami (2012), computers and related technologies offer potent tools for meeting the new challenges of designing and implementing assessment methods that go beyond conventional facilities and practices to record a broader repertoire of cognitive skills and knowledge.

The use of computers to administer tests is known as computer-based testing. Different phrasings used to portray PC Based Test (CBT) incorporate PC Helped Testing (Feline), Mechanized Appraisal, PC Supported Evaluation (CAA), PC Based Appraisal (CBA), Online Evaluation, Electronic Appraisal, Innovation Improved Appraisal, Robotization Appraisal, E-Appraisal or Test or Assessment (Mubashrah,2012). According to Ogunlade (2012), a computer-based test involves the candidate sitting in front of a computer, answering questions displayed on the monitor, and using a keyboard or mouse to do so. The use of technology in the assessment of learning outcomes can be described as the automation of educational assessments, whether they are school-based or other public examinations.

Computer-Based Testing (CBT) is broken down into two categories: linear/fixed CBT and adaptive CBT. Computer-based linear and fixed tests are most like paper-based tests in that they use a random method and can be administered to a fixed set of questions to provide a modest security benefit. Alabi ( 2012) defined a linear CBT as a full-length examination in which the computer selects a variety of questions for each individual without taking into account their level of performance. When an examinee answers a question correctly on CBT adaptive testing, the subsequent test item is slightly more difficult. And until a question is answered incorrectly, the difficulty of the questions posed to the examinee continues to rise. The following question is slightly more straightforward. Alabi (2012) went on to say that in a computer-adaptive test, each student gets questions that are difficult enough for their abilities. The answer to each question and all previous responses are used by the computer to decide which question will be asked next. This means that different questions will be given to different test takers, even if they are in the same hall on the same day. Using this method, The CBT method will eliminate collusion, giraffe, and many other examination malpractices.

### **Technology-Based Assessment**

According to Bridgeman (2009), the advantages of CBT include streamlined administration, lower printing costs, paperless distribution, increased test security, speedy feedback, and uniform support tools. Using CBTs, test timing can be easily managed, ensuring that all students have the same amount of time to complete a test. It is no longer necessary to print, track, and mail the test when it is in electronic format. CBT files can be sent just before the testing window when test security is a problem. This makes it less likely that test questions will be revealed before the test. CBTs can be scored immediately, providing students and teachers with useful feedback. Students can have access to the same support tools, such as dictionaries, calculators, and text-to-speech, through CBTs, but they can also only use those tools when necessary (Bridgeman, 2009).



It's easy to understand why so many schools are using technology for assessments. Online testing accounts for 44% of upper elementary school students. Over half of the middle and high school students took their tests online in 2013. According to Project Tomorrow (2014), this is an increase from 2009, when it was reported that 39% of secondary students were taking tests online. This degree of purpose conforms to gauges tracked down by Dark, Thomas, and Lewis (2010) with 84% of U.S. K-12 instructors revealing the accessibility of innovation to control evaluations, with 61% of those educators detailing that they use innovation to oversee appraisals frequently. Classroom response systems and computer-based assessments, for example, are included in this estimate in addition to online assessments. According to Grey, Thomas, & Lewis (2010), while only 55% of secondary teachers reported using technology-based assessments frequently, 64% of elementary teachers did so frequently. Because so many schools use technology-based assessments, some of them are likely large-scale.

According to Envision International Cooperation (2010), tests with reading passages may be more difficult when administered on computers, and CBT may have an impact on test scores, resulting in equivalence with PPT. Thus, Bugbee (1996) concluded that testing is affected by computer use; even though CBT and PPT can be the same thing, especially if the people who made the tests take responsibility and show how the same thing can be done. He went on to say that the barriers to using CBT include a lack of understanding of the particular requirements for implementing and maintaining it, as well as inadequate test preparation; highlighting the necessity of taking user characteristics, design, development, and administration into account when using CBT.

The quality of the monitor was identified as one of the numerous factors that influence students' performance when questions are presented on a computer by Schenkman, Fukuda, and Persson (1999). on how CBT affects the attitudes and actions of students.

According to Butler (2003), a moderate number of tests and improved student attitudes are linked; especially considering that the majority of his respondents were more favorable to the proctored CBT facility than to in-class, paper-and-pencil testing.

In a study of the effects of a CBT on achievement and test anxiety that investigated the relationship between computer anxiety and computer experience and assessed the affective impact of computerized testing on students, Donn (1991) found that the mean achievement score was significantly higher for the computer-based group.

CBT, or technology-based assessment, gives students opportunities to measure complex knowledge and reasoning that the traditional PPT method does not allow for. According to Abubakar and Adebayo (2014), PPT only evaluates students' cognitive abilities. They also mentioned that both cognitive and practical abilities can be evaluated with e-examination. E-testing software is used to evaluate cognitive abilities, whereas simulation software or e-portfolios are used to evaluate practical abilities. In a similar vein, Obioma (2013) asserted that, if carefully designed, automated assessments can accurately and comprehensively assess students in the three domains of learning, cognitive, psychomotor, and affective.



Due to the numerous advantages of CBT, employers in Nigeria now use electronic aptitude tests for job seekers, and universities, including the National Open University of Nigeria, register and conduct e-examinations for their students during semester exams and admission selection tests. As a result, the initial low academic achievement in CBT that was caused by negative effects like computer anxiety and/or test anxiety soon vanished as subsequent CBT exams produced impressive academic achievement for many respondents. Telia and Bashorun (2012), in a study whose findings demonstrated that the respondents(students) at the University of Ilorin have a positive attitude toward computer based test (CBT), with more than half of them indicating a preference for CBT over PPT and establishing a strong perception that CBT increases respondents' performance in learning (Clifford and Scalise, 2006).

### **Benefits of Computer Based Test(CBT)**

The following are the advantages of CBT in the education sector:

1. Precision evaluation through adaptive testing, in which the prior response(s) determine the next question.
2. creation of easy-to-transfer digital records of student growth and development across grades.
3. Greater adaptability in terms of exam location and timing.
4. increased dependability as a result of machine marking's superior reliability to human marking.
5. Computerized marking in impartial assessment does not discriminate against any candidate and does not know the students.
6. More efficient storage of tens of thousands of answer scripts which can be stored on a server's portable hard disk, whereas paper scripts require physical space.
7. Enhanced question formats that incorporate multimedia and interactivity.
8. To cut down on cheating, question banks and randomizing the questions and order of responses are used.
9. The examinee can receive immediate feedback.
10. Enhanced test security as a result of encryption and electronic transmission.
11. Reduces administration time and resources.
12. Preservation of plants used to make paper and pencils will help conserve the environment.
13. Lower long-haul costs; When we have all the computers in the next 10 to 15 years, nobody will complain about CBT's rising cost (Okoronkwo, 2015).

### **Obstacles to the widespread adoption of computer-based tests in Nigeria**

Baker-Eveleth(2006) found that implementing computer exams necessitates a secure testing environment that prevents students from searching the internet, scanning their computer hard drives, or messaging or e-mailing friends for answers. Fagbola (2013) posited that the e-examination platform's success in practice for real-time adoption is undermined solely by the absence of a standardized or unified CBT development model. The followings are some additional obstacles that prevent CBT from being fully implemented in Nigeria and other developing nations:



1. Access to insufficient ICT infrastructure, including hardware, software, and bandwidth (Obioma (2013)). In terms of capacity, accessibility, reliability, and security, many of the infrastructures for automated examinations are either out of date or overworked. Again, for students to have access to the internet, they must travel far to urban centers because our rural areas do not have access to internet facilities. To lower the cost of internet bandwidth access in Nigeria, rapid progress in broadband penetration is required.

2. Energy source: The difficulty of Nigeria's erratic power supply has defied all efforts by various governments. In Nigeria, erratic and frequent power outages are a persistent issue that affects education as well as the rest of the economy (Oye et al., 2011). Since the majority of rural communities are not connected to the national grid, schools in those areas cannot effectively conduct practicals. There are numerous instances of power failures interrupting the examination during the online JAMB UTME.

3. Inadequate ICT skills among students and candidates: Many school leavers in the nation are not computer proficient. Even many primary and secondary school teachers are unable to use any software or boot a computer. Students cannot be adequately prepared for CBT if these analogue teachers teach them ICT skills. And this anxiety explains why students, parents, and even teachers opposed JAMB's full implementation of CBT at the 2015 UTME. According to Ilesanmi & Lasisi (2015), Nigeria does not only lack ICT infrastructure but also the human skills and knowledge necessary to fully integrate ICT into secondary school education.

4. Management of examinations with honesty: Other CBT centers in Nigeria are privately owned cyber-café's, outside of the ICT centers at higher education institutions. One of the primary justifications given for switching from PPT to CBT is to cut down on the number of instances of examination malpractice in the country. However, it is impossible to ensure that these businessmen will adhere to the prescribed procedure for collecting biometric data during registration and verification during the exam. The SSCE examination has demonstrated that the majority of privately owned schools operate solely for financial gain, resulting in a variety of exam malpractices. If immediate action is not taken, this syndrome of exam miracle centers may spread to CBT centers. Through public-private partnership (PPP), all levels of government should construct, equip, and maintain at least four standard CBT centers in each of the country's 774 local government areas. This will make it easier for the country to conduct e-examinations and guarantee that examinees will be treated fairly.

### **Prospects of CBT in Nigeria**

prospects for computer-based tests (CBT) in Nigeria are very good, and they include functional computers, power generators, and internet connectivity, among other things. Through PPP and TETFUND, collaboration with corporate organizations is already producing positive results for tertiary institutions. At the moment, every Nigerian tertiary institution has an operational ICT center. Finally, to meet UNESCO's requirement of 26% of the annual budget, education funding should be increased by all levels of government. This will make sure that the country gets more money for buying ICT infrastructure.



Various educational establishments should also vigorously pursue public-private partnership initiatives to increase e-learning capacity in terms of human and material resources. In addition, the government ought to construct and equip CBT centers to stop private testing centers from selling exams in Nigeria.

## **2. CONCLUSION**

In this technologically advanced era, the impact of computer-based tests in Nigerian tertiary institutions has improved teaching and learning and made it simpler for teachers to achieve their goals. Because students can use ICT tools like Computer Assisted Instruction for individualized learning, teaching is no longer centred on the teacher. The majority of Nigerian tertiary institutions have yet to fully embrace these innovations, despite the impact of computer-based examinations. Computer-based exams should be integrated into Nigerian higher education institutions. These efforts are hindered by issues like inadequate ICT infrastructure, power supply, inadequate ICT skills of students and candidates, examination manager integrity, acceptability, and software factors. Through the appropriate use of ICT tools for computer-based examinations, governments, school owners, and individuals in Nigeria are required to investigate the issues outlined in this paper and propose solutions. This will go a long way toward making teaching and learning more interesting, stimulating, admirable, and efficient. It will also improve Nigeria's standard of education.

### **Recommendations**

The following recommendations are made to ensure that computer-based examinations are widely used in Nigerian higher education institutions:

1. All Nigerian tertiary institutions should have ICT facilities provided by the government.
2. Information technology tools should be provided to institutions at all levels by the government.
3. Given the significance of practical knowledge in the use of ICT tools, educators should be more committed to their use.
4. In Nigeria, the government should make sure that all tertiary institutions have enough electricity.
5. Satisfactory assets ought to be made accessible for the arrangements of ICT apparatuses in Nigeria's tertiary
6. establishments.
7. In Nigerian higher education institutions, ICT resources should be utilized by both teachers and students.
8. To completely eradicate examination malpractice, every resource should be directed toward the full implementation of CBT in all public examinations.
9. Before addressing CBT's difficulties, complete compliance with mandatory computer education at all educational levels should be ensured.
10. Since teachers are required to impart knowledge to students before the examination, the curricula of all teacher education programs should be strengthened with more practical ICT content.





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