A REVIEW OF CHALLENGES OF STUDENTS AND LECTURERS TOWARDS THE IMPLEMENTATION OF COMPUTER-BASED TEST (CBT) IN NIGERIAN HIGHER EDUCATION INSTITUTIONS

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Abstract

This study reviews the challenges of students and lecturers towards the implementation of Computer-Based Test (CBT) in Nigerian higher education institutions. In Nigeria, quite a large number of Polytechnics have either developed their portal or have one portal deployed for them for the purpose of computer-based test (CBT). It has tremendous positive effect on teaching, learning and assessments of students. Increased access to IT and ICT in the home; at work and in educational establishments mean that learning has becomes a truly life-long activity, an activity that has drastically changed how students are assessed by their lecturers and at the same time changed how lecturers now assessed their students not in an orthodox way of assessment but technologically inclined method. Present-day reality were highlighted by the study. This paper looked at the challenges facing implementation of CBT in Nigeria higher education institution. It also looked at the merits and the demerits of CBT, problem of Pencil-Paper Test was equally enumerated, perception of students and lecturers was equally highlighted. The paper recommended among others that the power supply in the country be improved upon, governments at all level should provide infrastructural support to all tertiary institutions in the area of technology, they should procure for schools software that will help both the students and their lecturers to have hitch free Computer-Based test.

Keywords: Perception, students, lecturers, implementation, computer-based test

Introduction

Technology has come a long way in changing human endeavours toward attainment of precision, efficiency and accuracy. As a direct result of this, there is a need for educators and stakeholders in education to explore the advantages of technology in educational settings, especially in this era. Some of these advantages include, but not limited to using technologies in students’ admissions, registrations, learning, evaluations, as well as communication of information between students and their colleagues, or the lecturers. Notably, in the past few years and COVID-19 pandemic period, we have witnessed further extensive use of technologies, popularly called Information and Communication Technology (ICT). Interestingly, a component of technology which has attracted educators globally is known as
Computer-Based Test (CBT); which is known for its flexible timing functionality, robustness and scalability, stand-alone subject module, and standardization of test administration conditions (Mumtaz, 2000).

Computer-Based Test is the use of computers to administer tests. Other terminologies used to describe Computer-Based Test (CBT) include Computer Assisted Testing (CAT), Computerized Assessment, Computer Aided Assessment (CAA), Computer Based Assessment (CBA), Online Assessment, Web-Based Assessment, Technology Enhanced Assessment, Automation Assessment, and E-Assessment or Test or Examination. (Obioma, Junaidu & Ajagun, 2013; Alabi, Issa & Oyekunle, 2012). Sadiq (2011) posits that Computer-Based Test is an internet-based test or assessment that is administered using computer or other technological devices. It can take two formats: The first type requires students to fill in their answers on a paper form which is then fed into a computer optical mark reader. The reading of the paper, scoring, and report on the test reliability is done by the computer optical mark reader. The machines, in the second form, provide students with an evaluation system to input their answers and provide immediate feedback (Sadiq, 2011).

Computer-based research has since evolved rapidly as new query formats, alternative measurement methods, changes in test administration, direct input to test takers. In the second type, the computers provide an assessment interface for students to input their answers and receive immediate feedback (Sadiq, 2011). Computer-based testing has developed as new question formats, alternative models of measurement, improvements in test administration, immediate feedback to test takers, and more efficient information gathering are possible through using computers. A growing trend among organizations and test developers is increasingly moving their paper-and-pencil tests (PPT) to computer-based tests (CBT).

Alabi (2012) described Computer-Based Test as a method of administering tests in which the responses are electronically recorded, assessed, or both. Computer-Based Test (CBT) is grouped into linear/fixed CBT and adaptive CBT. Linear and fixed computer-based test, most similarly to paper-based testing is the random method which can be used to administer a fixed set of items to provide a modest test security benefit such as content and difficulty levels.

Nigeria Polytechnics are increasingly adopting Computer-Based Test (CBT) to replace the traditional Paper-Based Test (PBT) for academic assessment of students like other educational institutions globally; successes of transition from Paper-Based Test (PBT) depend on the extent and ability of testing professionals to communicate the benefits and limitation of Computer-Based Test to stakeholders (Pinner, 2011). The use of Computer-Based Test (CBT) for assessment can provide several benefits for educators and test takers. It is on this note that Ogunlade and Olafare (2010), concludes that CBT is a system which spurs development in education as well as other sectors of the economy. CBT has advantage over Paper-Based Test, both for the lecturers that give the test and for the students who participate in the test. CBT allows for more accurate, secure rapid and more controlled test administration. Administration of test on the computer helps to minimize almost entirely the use of paper printing. This could also reduce administrative cost as well as environmental impact.
According to Fluck, Pullen and Harper (2009), there have been a number of mixed reactions on students and teachers’ perception of the CBT. Previously, more people anticipated problems with the use of computer assisted assessment. Fluck et al (2009) reported the main disadvantages as being increased anxiety amongst those unfamiliar with the use of computer and as such students agreed they are “technophobic”. The challenges of examinees by means of microcomputers demand appropriate software design. To comply with this demand, students’ and lecturers’ belief and perception on the advantages and disadvantages of a computerized test are important since user perceptions and criticism are crucial in the acceptance, implementation and improvement of computerized tests, whilst recognizing the system level advantages associated with Computer-Based Test, it is important to explore the relationship between assessment mode and the behaviour of the students being assessed. If the term “Affordance” is used to describe what is made possible and facilitated, and what is made difficult and inhibited by a medium of assessment (Davey, 2011). It is possible that the affordance offered by the computer mediated assessment differently than if they were engaged in paper-based assessment.

Bennett (2019) stated that only few students found the CBT system easy as most students considered computer-based assessment unfair. Also, Lee, Yoon and Lee (2009) observed that majority of students’ preferred computer-based assessment for their exams. These show that the acceptance of Computer-Based Test is dependent on the course being tested, while some students have a positive attitude towards computer-based assessment (Lynch & Whitley, 2000). Others consider it unfair (Barbara, 2002). These findings show that the acceptability of Computer-Based Test can be said to be dependent on the course type. (Lynch & Whitley, 2000), others consider it unfair (Barbara, 2002). These findings show that the acceptability of Computer-Based Test can be said to be dependent on the course type. Fluck, Pullen and Harper (2009) discovered that student acceptance of CBT is dependent on their performance. Though there has been a diverse opinion among students on its acceptance.

The advantages of using computer technology for educational assessment in a global sense have been recognized and these include lowering administrative cost, time saving and less demand on teachers among others. Alabi, Issa and Oyekunle (2012) stated that Paper-Based Test has many problems such as tedious processes as the examination was conducted at various and distant centres simultaneously and marked manually; high risks of accidents during travels by both the staff involved and the prospective students for the paper examination; cost of conduct of the examination on the part of the examination bodies including honourarium for invigilators, coordinators, markers, collators and other allied staff; subjective scoring and plausible manipulation of results; late release of results and missing grades; bank draft method of payment by candidates riddled by fraud, loss of money, stress and trauma. The problems of paper-based test also involve heavy resources in terms of manpower and funding (Abubakar & Adebayo, 2014). However, Davey (2011) stated that a wide variety of options is available for conducting test out of which technology is one of the most important.

Zhang, Powers, Wright and Morgan (2003) asserted that technology is useful for constructing responses on screen, allows marking quality to be monitored in real time and potentially eliminating the need to gather examiners together. In recent time, technology offers many new opportunities for innovation in educational assessment through potentially and powerful scoring, reporting and real-time feedback mechanisms. Universities have implemented numerous attempts and efforts to integrate information and
communication technologies (ICT) into administration and instruction process by the creation of the management information system (MIS) unit (Mejabi & Raji, 2010). It is on this note that universities integrate part of information and technology for the purpose of testing the students. One of the modes of testing that is technology-based is the Computer-Based Testing (CBT).

According to Fehintola (2018), the two types of CBTs are:

- **Linear Test** - This involves a full-length examination in which the computer selects different questions for individuals without considering their performance level.

- **Adaptive Test** - the computer selects the range of questions based on individuals’ performance level. These questions are taken from a very large pool of possible questions categorized by content and difficulty (Alabi, Issa & Oyekunle, 2012). Whatever the type used the effectiveness of a computer-based testing system depends largely on factors such as standardization, security, examination conditions, mode of administering the examination, cost and so on.

Computer-Based Test has some merits and demerits and all have been listed as follow below. Joint Information Systems Committee (2008) points out that the characteristics of good assessment technique that would have been a strong well evaluated pedagogy, as well as providing support for both staff and students and of course online assessment or test has all the other advantages of remote access and choice of time and place of assessment, although the latter may be limited for summative assessment that require security. Question types can include multimedia material. Provide more flexibility than pen and paper. Easy and secure distribution of assessment material is guaranteed. Document management techniques can be used to organize and store questions and question papers. Marking can be speeded up and even automated in many situations provide opportunity for adaptive tests that respond to the candidate’s answers, professional feedback to administrators, teachers or trainers. It takes time and money to produce traditional assessment but Computer-Based Test is quick and simple to produce but slow and expensive to use (Joint Information Systems Committee, 2008).

Computer based testing can encourage the improvement of more legitimate evaluations. CBT has the possibilities of guaranteeing viability and effectiveness in instructing, proficient advancement, certainty and direct criticism. Computer have changed the way we work, be it any calling (Mubashrah, Tariq & Shami, 2012). Computerized standard testing likewise gives leeway in booking, since tests can be managed in a great deal less time than it takes to regulate a paper test. This makes testing more open to those with all day employments or full class plans. Since the calendar can be packed, more test dates can be given consistently. The prompt and calculation and accessibility of test scores makes it workable for test takers to anticipate their subsequent stages directly in the wake of taking the exam. CBT assumes a key part in the cutting-edge arrangement of Education. The way toward learning has gone past noting examination inquiries with pen and paper. Online examination has changed the instruction business. It has made the fantasies of separation taking in a reality.

Examination is not any more constrained to paper and pen organizes (Johnson, 2009). The focal points of CBT frameworks over conventional paper-and-pencil testing (PPT) have been shown in a few similar works and as specified by, CBT is not only an option strategy for conveying examinations, it also speaks to an essential subjective move far from customary techniques, for example, paper-based tests. Regardless of, these preferences accessible in computerized test organization as it were demonstrated
that, it doesn't imply that CBTs are characteristically superior to paper-and-pencil tests. Past review by
have even discovered that testing group does not influence test scores and all things considered CBT
can be viewed as a substantial and worthy testing mode.

On the other hand, the Paper and Pencil Test (PPT) or Paper-Based Test (PBT) is gradually being phased
out globally because of its limitations that have allowed widespread malpractices during the
examinations. The problems of PPT as enumerated (by Alabi et al. 2012) are summarized below:

(i) Tedious processes as the examination was conducted at various and distant centres
    simultaneously and marking done manually.
(ii) High risks of accidents during travels by both the examination officials and the candidates
    for the paper examination.
(iii) Subjective scoring and plausible manipulation of results.
(iv) Late release of results and missing grades.
(v) High cost of conduct of the examination on the part of the examination bodies including
    honouraria for invigilators, coordinators, markers, collators and other allied staff.
(vi) Bank draft method of payment by candidates was riddled by fraud, loss of money, stress and
    trauma.

The above steps are very much prone to violation at any stage and also it involved heavy resources in
terms of manpower and funding. Although the primary uses of microcomputers in education are
instructional and administrative, the expansion of computer technology has created many possibilities
for computer applications in the area of testing and assessment. Many important issues have to be
considered when administering tests by computers. Among these are the equivalence of scores obtained
in computerized testing compared with conventional paper-and-pencil tests, and the impact of
computerization on the test-taker.

Abubakar & Adebayo (2014) observed that PPT assesses students only on cognitive abilities. They also
noted that e-examination can be used to assess both cognitive and practical abilities. Cognitive abilities
are assessed using e-testing software while practical abilities are assessed using e-portfolios or
simulation software. Similarly, Obioma et al. (2013) opined that automated assessment if carefully
designed can comprehensively and reliably assess students in the three domains (cognitive, psychomotor
and affective) of learning. Federal Ministry of Education (2012) pointed out that the ultimate goals of
information and communication technology in our national educational system is to deploy technology
to support all aspects of national assessment operations in Nigeria, from online registration of
candidates, computer based administration of examination and the scoring of examination scripts, to the
management of assessment feedback within and across institutions in Nigeria.

Individuals can take a Computer-Based Test even with minimal or no previous computer experience,
since a designed instruction provided in a basic computer tutorial before the examination will provide
the experience needed to take the examination using a computer mouse. One may spend much time on
the tutorial to ensure comfort ability with the computer and with the assessment before the official timed
examination.
Challenges of Computer-Based Test in Nigeria

Baker-Eveleth (2006) observed that implementing computer exams requires a secure testing environment, one that prevents students from seeking answers by scanning their computer hard drives, instant messaging or e-mailing friends, or browsing the internet. To Fagbola, Adigun and Oke (2013), lack of standardized/unified CBT development model alone undermines the success of the e-examination platform for real-time adoption in practice. Fluck et al. (2009) posited that online assessment may not be effective for evaluating creativity, problem solving ability, critical thinking, reflection, or authentic learning; collectively the characteristics of deep and effective learning. Other challenges militating against the full adoption of CBT in Nigeria and other developing countries include the followings:

1. Inadequate ICT infrastructure including hardware, software and bandwidth accessibility:
2. Power supply:
3. Students/candidates inadequate skills in ICT
4. Integrity of examination managers
5. Acceptability
6. Software factors

Perception of Students towards Computer-Based Test (CBT)

There are numerous variables that impact on student’s performance when questions are presented on a computer, such as the quality of the monitor (Schenkman, Fukuda, & Persson, 2009) and others. Attitude is one of the most prominent variables that have not been so much considered in various related studies particularly from the African context and Nigeria particularly. Attitude by definition is an inner psychic state influencing behaviour. We can understand an inner state from actions and words. For instance, we may presume that a person actively avoiding a computer has a negative attitude towards it. Attitude is not an inborn, instinct phenomenon; it mainly depends upon person’s experience and its impact in a new situation (Saparniene, Merkys, & Saparnis, 2012).

According to Hooshang, Monirosadat and Seyyed (2019), there is a difference in the students’ perception towards the computer. It seems that students who are frequent users of computers and the Internet and are more familiar with computers attain dramatic educational gains on CBT. Computer perceptions or prior perceptions toward the use of computer play a crucial role in implementing CBT successfully. Some studies indicate that test takers have positive perception toward CBT and that students showed a high preference for CBT, although no relationship between learners’ perceptions and their performance on CBT was detected. According to McDonald (2002), computer aversion is an unpleasant feeling of fear and uneasiness experienced by a student when s/he is working with a computer. According to McDonald, the actual effects of computer aversion (sometimes called computer anxiety) on test takers’ performance on CBT are not clear and conclusively definite. However, test takers who have a strong aversion toward the use of computer experience achieve low performance in CBT (Balogun & Olanrewaju, 2016).

Perception of Lecturers towards Computer-Based Test

Research shows that if lecturers perceive computer programs as either satisfying their own needs or their student’s needs, it is likely they would implement it in school. Lecturers’ adequacy, skills, and
attitudes influence successful implementation of CBT in schools (Keengwe & Onchwari, 2011). If lecturers’ attitudes are positive towards use of computers, then they can easily provide useful insight about implementation. Lecturers’ perceptions have been found to be major predictors of the use of new technologies in instructional settings (Almusalam, 2001). Mumtaz (2000), in Molenje, Mukwa and Too (2017), reported that those lecturers’ perceptions about teaching and learning with CBT are central to integration.

To be successful in computer use and integration, lecturers need to engage in conceptual change regarding their beliefs about the nature of learning, the role of the students, and their role as lecturers. Hence the successful use of CBT into classroom largely depends on lecturers’ perceptions and belief relating to these. In fact, it has been reported that perceptions towards computers affect lecturers’ use of computers in the classroom and the likelihood of their benefiting from training (Molenje, Mukwa & Too, 2017). It is found that less technologically capable lecturers who possess positive perceptions towards CBT, require less effort and encouragement to learn the skills necessary for the implementation of CBT in their design activities into the classroom. Therefore, lecturers who have positive perceptions towards CBT itself will be positively disposed towards using it in the classroom. Therefore, if lecturers want to successfully use technology in their classes, they need to possess positive perceptions to the use of technology. Such attitudes are developed when lecturers are sufficiently comfortable with technology and are knowledgeable about its use (Molenje, Mukwa & Too, 2017).

A study by Simonson (2008) reported that lecturers’ skills and perceptions were related to their use of computers in teaching and learning. The more skilled lecturers were in computer use the more likely they were to use it in teaching and learning in the classroom. Further study by Drent & Meelissen (2008) revealed that positive perceptions, personal entrepreneurship and computer experience had a direct positive influence on adoption and use of CBT by lecturers. A similar study by Huang & Liaw, (2008) showed that lecturers’ skills and perceptions influenced their acceptance of the usefulness of CBT and its implementations in schools. A survey by EU School Net in 2010 cited by Andoh (2012) involving lecturers’ use of Acer net books in six European union countries, revealed that, a large number of participants perceived use of net book had positive impact on their learning, elicited interest, promoted individualized learning and helped to lengthen study beyond school day. However, a study by Korte & Husing (2007) suggested that a small number of lecturers perceived benefits of computer use in schools were not clearly identified. Some lecturers viewed computer use as a waste of time and expensive (Zakaria & Khalid, 2016).

Challenges Encountered by Students and Lecturers in Using Computer-Based Test

Use of CBT in teaching and learning may encounter many difficulties. Several studies have divided these barriers into two categories, extrinsic and intrinsic. Molenje, Mukwa and Too (2017) reported extrinsic factors as first order and cited access, time, support resources and training; intrinsic barriers as second order and cited attitudes, beliefs, practices and resistance. Extrinsic barriers as pertaining to organization, rather than individuals and intrinsic barriers as pertaining to lecturers’ administrators and learners has been reported. The barriers can also be classified into resource, lecturer’s level, and school level and management barriers (Adeyanju & Olaniyi, 2010). Resource barriers include lack of adequate computer assisted learning resources like computers, internet connectivity and content in digital form,
devices that support teaching and learning like the projectors, speakers and optical disk readers and players. Lecturer level barriers include, lack of lecturer’s confidence, some studies have investigated the reason for lack of lecturer’s confidence of using computer assisted learning in teaching and learning, for instance, Almusalam (2001) asserted that lecturers fear of failure caused lack of confidence, and limitation in CBT knowledge and this makes them feel anxious about using computers in teaching.

Conclusion
This study has shown that the appropriate use of ICTs can catalyze the paradigmatic shift in both content and pedagogy that is at the heart of education reform in the 21st century. Similarly, it has shown that if designed and implemented properly, ICT-supported education can promote the acquisition of knowledge and skills that will empower students for lifelong learning. When used appropriately, ICTs, especially computers and Internet technologies, enable new ways of teaching and learning rather than simply allow teachers and students to do what they have done before in a better way. These new ways of teaching and learning are underpinned by constructivist theories of learning and constitute a shift from a teacher-centered pedagogy, in its worst form characterized by memorization and rote learning to one that is learner-centered.

Recommendations
Since digitization of every aspect of life is now the order of the day including education sector that happen to be the bedrock of any nation, it is imperative for us to posit the followings:

1. The power supply in the country should be improved upon.
2. Governments at all level should provide infrastructural support to all tertiary institutions in the area of technology.
3. Government should procure for schools software that will help both the students and their lecturers to have hitch free Computer-Based test.
4. Bandwidth should be made available for students and lecturers on campuses for assessing some open software for range of information
5. Computer-Based test should be made compulsory in all higher education institutions in the country in order to integrate Nigeria’s higher education system fully into the digital age.

References


