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Imperatives of Computer Base Test (CBT) on Performance of LIS Students: A Case Study

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Abstract
The paper espouse the fact that paper pen test (PPT) is slowly replaced by computer base test (CBT) introduced over five decades ago in most tertiary institutions. It itemized the benefits and challenges of CBT. The focus is to assess the performance of students of LIS in a Nigerian university who pioneered the project. Factoring incorporated courses, necessity for the incorporation of CBT, influence of CBT on student performance and the challenges of CBT on these students performance anchored the thrust of the paper. The study was quantitative; questionnaire was used to collect data that is guided by the objective of the study. A total of 267 students participated. The study revealed that CBT incorporation is still at pilot level and that the pencil pen test stills prevails in the study area, however, since CBT incorporation, it has put to rest the claim that drudgery was one of the reasons for its utilization. Results show that its incorporation has encouraged students to be thorough and improve their technical skills. Challenges hinges on funding of the project, training of personnel and students must be prioritized for sustainability.

Keywords: CBT, PPT, undergraduate, students, examination, DLIS

Introduction

Examination within the academic and employment domains are moving from Pencil-and-Paper Test (PPT) to the use of Computer Based Test (CBT) for several reasons boarding on quality and quantity integrity, timeliness and control (Alessi & Trollip, 1991, Bubgee, 1992, Darrell, 2003, Peter, 2004, Charlmers, 2011). Worthy of note is that most authors show resistance and still argue in support for the application of CBT. Generally many agreed that CBT reduces the drudgery caused by large and increasing participants during examination and testing situations to reduce drudgery. A peculiar environment where it is applied is the universities in Nigeria which is characterized by an annual increase of students' intake who constitute the large

number of scripts to be graded which takes longer period to mark and compile results. This does not affect the other responsibilities of undertaking research and publishing required of academic staff to remain relevant in the system (Darrell, 2003).

The history of CBT is traced back to 1960s when it was introduced to test knowledge and problem solving skills (Bunderson, Inouye & Olsen, 1989, Peter, Bill & David, 2004). Today, CBT has metamorphosed into two multi- from mono-platform for candidate assessments; the first is such that computer provide an assessment interface for candidates to input their answers and receive feedback via the computer, the second platform provide a ready surface where manually candidates fill with prescribe marking and the response is marked using the computer usually are multiple choices (Kuzmina, 2010). The second type of CBT is the most familiar and popular because of its adoption and application by several national and international examination boards (Olsen, Maynes, Slawson & Ho, 1986, Kuzmina, 2010) in Nigeria and beyond. Candidates' filled responses are fed into a computer optical mark reader which reads the form, scores and report test reliability. Accordingly, Peter (2004) reported that CBT is not just an alternative method for delivery examination; it represents an important qualitative shift away from traditional methods such as paper based test.

Library and Information Science is one among the most populated course of study in Ahmadu Bello University, Zaria, the incorporation of CBT is arguably based on the reasons justified for CBT incorporation by other authors.

Statement of the Problem

The speculations that Computer Based Test (CBT) has the ability to automate a very consuming task of marking and monitoring processes, can be used in a supervised and non-

supervised environment and allow students to check their own progress through self assessment may vary depending on numerous factors such as incapacitations to write test items, store in bank and retrieve for the purpose of the examination/test. In Department of Library and Information Science, Ahmadu Bello University (ABU), Zaria CBT began in 2015 between 200 and 300 levels students to enhance test delivery system. These students are pioneers and are now in the last year, can it then be said that the application of CBT has influenced their performance? This is the thrust of the study.

Research Objectives

To undertake this investigations, the study shall be guided by the following objectives:

i. Determine the CBT courses incorporated in the DLIS of ABU
ii. Determine what necessitated the incorporation of CBT by the department
iii. Determine the influence of CBT on student performance
iv. Examine the challenges affecting the application of the CBT.

Literature Review

CBT embraces wide range of assessments, this influenced its christening; i.e., it is also known as e-assessment, online assessment, computer assisted/mediated assessment and computer-based assessment (Alessi & Trollip, 1991, Schege & Kirbly, 2007, Kuzmina, 2010). This implies that CBT is the use of ICT for assessments – educational assessment, health assessment, psychiatric assessment, psychological assessment, etc incorporated to eases assessment and obtain immediate feedback.

These assessments utilize computers connectivity. According to Damson (2015), e-assessment includes multiple choice, online/electronic submission, computerized adaptive testing and computerized classification testing. However, what is imperative about CBT is that it is

widely used by exam awarding bodies particularly those with multiple or international study centres and those which offer remote study courses, and stimulate practice-based activities which traditional paper and pen assessment fall short of replicating. This implies that CBT is work in progress. Blazer (2010) point CBT primarily like other assessment platforms to measure cognitive abilities, demonstrate what has been learned after a particular educational event and practical abilities.

Wild, Howieson, Webbe, Adriana & Jeffrey (2008) itemized the characteristics of CBT courses to be summative, formative or diagnostic assessment purpose with or without associated feedback. For instance, they could be based on multiple choice questions (MCQs), objective questions types, and non-objectives questions (essay, short answer) that may differ from paper-based assessment. CBT is such that offers immediate feedback and make accessible anytime and anywhere drawn from a single shared question bank (Joh, Cynthia, Judith & Time, 2002, Sorana-Daniela & Lorentz, 2007).

Schege and Kirbly (2007) gave the necessity for the introduction of CBT to include but not limited to providing secure, consistent environment for certification and licensure to more flexible scheduling, and additional number of testing locations. They express these through a number of objectives as follows: to provide good technical service for students to take test easier; avail test taking year long; boosting the level of security and confidentiality necessary for test by using encrypted electronic systems, and eliminating the use of paper delivered testing and use of different forms of questions particularly audios and videos as the case may require. All the earlier studies presented one form of benefit of CBT over PPT. A comprehensive listing was done by Kuzmina (2010) who attested that administering tests by computer are well-known and documented, and include: 1) reduced testing time; 2) increased test security; 3) provision of

instant scoring; 4) better use of professional time; 5) reduced time lag; 6) greater availability for individual or groups testing; 7) greater accuracy; 8) greater standardization; 9) greater control; 10) greater utility with special students and groups; 11) long-term cost savings, and 12) easier adaptive testing.

The aim of introducing CBT must have great influence on improving academic performance. Academic performance according to Bello (2015) is the extent to which a student, teacher or institution achieves their short or long-term educational goals. It is measured through examinations or continuous assessments. It means CBT has a role to play, however, care must be taken because according to Wise and Plake (1989), CBT contribute to student test anxiety. Time lag is also required before CBT can be used to evaluate student academic performance because of the numerous underlying individual factors such as exposure and importantly academic performance elements such as test anxiety, environment, motivation, emotions and differences in intelligence and personality (Olsen *et al.*, 1989, Bernt, Bugbee & Arceo, 1990, Jacobs & Chase, 1992). Fam & Yakub (2016) assured that there is going to be improvement with student academic performance with the incorporation of technology because of its capacity to arouse the mental curiosity to become achiever in addition to the alertness in intelligence and conscientiousness. Wild *et al*. (2008) opined that the tendency to generate new types of learning is recognizable and capable of increasing interactivity and adaptive testing which CBT ensures.

Friedrich (2008) concern was what constitute reduction with the efficiency of service delivery in CBT environment, these was tagged as the challenges. Friedrich listed two challenges: funding and technophobia. The imperative to sustain funding is because CBT projects are expensive and requires enormous funding due to frequent hardware and software upgrades, fund to train facilitators and preservation of acquired resources. Arguing on the

negating influence of technophobia looked at the influence of inadequate skill and subsequent fear, perceive threats even by old professionals causing reluctance to jettison the old practice for the new and in most cases resistance using technophobia as excuse.

Khaleel (2017) perspective of CBT challenges is the quick deterioration of digital platform as a result of obsoleteness, disaster or virus attacks. Also a challenge is inadequate technology infrastructures such as frequent power outage constitute serious bottleneck to CBT application, and finally, inadequate personnel who are competent to handle CBT activities of programming, assembling and arranging is a great challenge to its application.

Research Methodology

Quantitative research method was adopted, the research design was survey and the populations were graduating students of Library and Information Science, Ahmadu Bello University, Zaria. A total number of 272 students who happen to pioneer the project were sampled and because they were manageable they remained the study population (Osuala, 2005). The instrument used to collect data from the respondents is questionnaire which solicits response on all aspects of the research objectives. Two weeks was allotted for the administration and retrieval of the research instrument. However, of the 272 questionnaires distributed a total of 267 were returned and found analyzable, these represents 98.16% response rate and sufficient for generalization (Osuala & Osuala, 2007). The data collected were analysed descriptively using only frequency counts and corresponding percentages presented in tabular forms.

Results, Analysis and Discussion

Table 1: Distribution of Departmental Courses enlisted for Incorporation on the CBT platform

S. No	Title of course	Credit load
1	Record and Archive	3
2	Information and Communication Technology (ICT)	3
3	Financial management	2
4	Quantitative Method in Library and Information Centres	3
5	Entrepreneurship in Libraries and Information Centres	2
6	Ethics in Information Work	3
7	Management in Libraries and Information centres	2

Source: Jibril (2017).

A total of seven courses that comprise of core and elective are proposed at the inception for incorporation unto the CBT platforms, however, four scaled through and only record and archive made it, three new entrant where included. The response of incorporation is given in table 2.

Table 2: Distribution of courses on the DLIS CBT platform

S. No	Title of course	Frequency count	Percentage
1	Information Organization	27	10.2
2	Records and archive	187	70.0
3	Indexing and abstracting	25	9.4
4	Security and Preservation	28	10.4
	Total	**267**	**100**

Table 2 shows the list of courses on the department of Library and Information Science (DLIS) CBT platform. It is clear that Records and Archive is consistent with the use of the platform as adjudged by the respondents (70%) as against the least Indexing and abstracting (9.4%) respectively. This implies that the paper and pen assessments still prevailed.

Table 3: Students perception of the necessity for the incorporation of CBT

S. No	Reasons for the incorporation of CBT	Frequency count	Percentage
1	Large number of students	60	22.5
2	Advent of technology	82	30.7
3	Easy assessment	125	46.8
	Total	**267**	**100**

The student response on the obvious reasons for the incorporation of CBT in the department was quiet amazing, many attested to the fact that it makes assessment easy (46.8%) probably because they can immediately know what they score during a test, interestingly many did not agree that drudgery (large number of students) was sufficient reasons for its introduction because it has the least scores of 22.5% as speculated in numerous literatures (Darrell, 2003).

The basis on what ways CBT influence student academic performance is given in Table 4.

Table 4: Distribution of response on ways which CBT influence student academic performance

S. No	Influence of CBT on Student performance	Frequency count	Percentage
1	Help students develop technical skills	103	19.29
2	Encourage students to read thoroughly because there is no chance of examination malpractice	115	21.54
3	Save student waiting time to know exam/test scores	49	9.18
4	Serve multiple students at a time	22	4.12
5	Reduce supervision time of the staff	80	14.98
6	Easy assesses and evaluate students	165	30.89

Table 4 is a multiple choice distribution of responses of the influence of CBT on students performance. It reveals that CBT is significant in academic environment because it help reduces the level of examination malpractice because it encourage students to read thoroughly. The student technical skills are developed and aroused. What is very significant is that it is a platform on which lecturers themselves assesses and evaluate their student cognitive dispositions. However, the students anxiety to see their test/examination scores does not significantly inspire students academic performance nor does its capacity to serve multiple students at a time an attribute that influence students performance.

Table 5: Challenges retarding the application of CBT

S. No	Challenges	Frequency count	Percentage
1	Insufficient personnel	30	11.3
2	Lack of infrastructure	101	37.8
3	Limited fund	71	26.5
4	Technophobia	65	24.4
	Total	**267**	**100**

What constitute the challenges affecting the full incorporation of CBT is itemized in Table 5. Insufficient personnel was not a significant challenge and concern (11.3%) but is was not the case with lack of infrastructure which pose a very significant challenge justifying the claims of Friedrich (2008) and Khaleel (2017) that the project requires enormous hardware and software, and frequent upgrade, respectively. To overcome the challenge of technophobia, Bailey (2011) suggested measures such as awareness, orientation and enlightenment because awareness is pre-requisite to subsequent use and participate in contributing content as could be case of lecturers.

Conclusion and Recommendations

Conclusion

In conclusion, CBT incorporation in DLIS has contributed to the repositioning of library students to appreciate the changes and the need to familiarize themselves with the use of technology for examination and other assessment purposes. Lessons abound from the numerous responses that the department can scrutinize to improve the effectiveness of the CBT and subsequent expansion to include additional courses.

Recommendations

The following are the recommendations of the study:

1. The number of courses incorporated since the inception of the CBT project grossly fall short of the total number of courses per academic session, core and electives and

participants. It is recommended that more courses be incorporated starting from 200 levels, prescribed in a systematic manner that it reflect core and elective, and either during first and/or second semesters.

2. Benefits of CBT to student academic performance also influence staff articulation and use of the technology. It is recommended that time lapses and failure of the staff to utilize the appropriate platform negates CBT benefits generally, therefore, awareness, orientation and sensitization must be prioritized by the department.
3. CBT contribute to students developing technical skills, operate under flexible test conditions and are encouraged to read broader, it therefore suffices to recommend that before final evaluation of student's academic performance elements such as test anxiety, emotional and personality complex should be diffused through avenues that can given listening ears to the student plight.
4. The best ways to address the challenges of CBT in the DLIS and improve student academic performance is to ensure that the platform is effective, the environment is user friendly, staff are competent, and funding very prompt to resolve infrastructural challenges and spending incurred on trainings.

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