

Perception of Lecturers on the Use of Computer Based Test (CBT) for Assessment in Public Tertiary Institutions in Bauchi State

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Abstract

This study investigates perception of lecturers on the use of computer based test (CBT) for assessment in public tertiary institutions in Bauchi state. Descriptive survey research design was used in the study. Three hundred and fifty three (311) Lecturers participated in the study. The instrument for data collection is Perception of Lecturers on the use of Computer Based Test (CBT) for Assessment Questionnaire (PLU CBTAQ). The reliability (0.85) indicates that Lecturers have positive perceptions on the use of CBT for assessment, the results also shows that lecturers have positive perceptions on the use of CBT for assessment. It was recommended among others that lecturers should be more encouraged to constantly use CBT while conducting their tests and examinations not minding the number of students.

Key words: *Computer Based Test (CBT), Perception, Lecturers, Assessment.*

1. Introduction

Information and Communication Technology (ICT) has turn to be one of the basic building blocks worldwide. Several countries now regard the understanding and mastering of ICT and its basic skills as concepts that is very vital in education (Hermawan, Deswila & Yunita, 2018). This is for the reason that ICT improves values to the processes of assessment of learning outcome in various institutions in the world. It incorporates different types of technologies which are used for capturing, processing and transmitting data and information using computer facilities (Brown, 2022). ICT is an umbrella term that consist of application, communication device, hardware and software, satellite systems as well as the numerous services and applications associated with it (Danladi, 2019).

Educational system has now been influenced by a fast change in ICTs as it is been used all the time for learning, teaching, research and assessment. This has improved the quality of teaching, learning and assessment in tertiary education (Brown, 2022). Quality is related to standard, therefore the standard of university education is achieved through evaluation process. Evaluation is a way of measuring a system in order to make a statement on the outcome of the system (Mohan, 2023). ICT specifically seen as the use of new technologies in an educational

context and serves as a tool for supporting the various components of education. Such components include; teaching, learning, research, resources management (human, material, financial resources), admission and examination processes also known as ICT tools for assessment among others. One specific form of ICT for assessment is the Computer Based Testing (CBT), also known as Computer-Based Assessment or e-exam. Computer based test (CBT) is a process of administering tests in which the answers are electronically recorded and assessed. It is commonly accessible and used for the purposes of conducting e-examination in various higher institutions in the developed countries (Helfaya, 2019).

There are two types of CBT which are, linear and adaptive, a linear test is a full-length examination in which the computer chooses different queries for individuals without looking at their performance level. It consists of a full range of test questions from easiest to most difficult-but not always in that order. The linear test is scored in the same way as a paper-based test. A computer adaptive test is one in which the computer chooses the series of questions based on persons' performance level (van Groen & Eggen, 2019). These questions are taken from a very large group of possible questions characterized by content and difficulty. When taking a paper-based test, the respondents are asked to answer questions ranging from easy to hard. In a computer-based adaptive test, each test-takers receives questions that are at the right level of difficulty for their ability. These tests begin with a question that is of medium level of difficulty for most test takers. After each question is answered, the computer uses the answer and all previous answers to determine which question will be answered next. The next question is one that best follows the earlier performance. This means that different test takers even in the same room on the same day will receive different questions. Since adaptive test questions are selected according to performance on previous questions, less time is spent than on a paper-based test on questions that are either too easy or too hard, usually, one cannot go back or skip ahead as is possible with the paper-based examination.

People attribute success and or failure in a task to something and whatever success or failure is attributed to which depends on perception of the task or situation. The use of CBT is a new innovation in Nigeria. Its acceptability and thus success will largely depend on individuals' views of this mode of testing. The choice of lecturers as individuals in CBT is because lecturers prepare the questions for CBT. Lecturers viewed important roles that CBT play in enhancing and integrating their conduct of assessment which is more effective than using paper and pencil mode of assessment (Obikeze, Amaechi, Akujieze & Anujeonye, 2019). Lecturers' belief toward a particular practice will help them set their goals in using CBT at various level of education. Gamede, Ajani & Afolabi (2022) affirm that those lecturers who rely on technology tools can be used to enhance lessons, motivate, and bring changes to their teaching, learning and assessment strategies will lead to accept technology with confidence.

All these studies are indicating lecturers' views or perceptions on the use of CBT for assessment. However, not many studies were conducted in Nigeria that looks into the lecturers' perception on the use of CBT in tertiary institutions see for instance (Obikeze, Amaechi, Akujieze & Anujeonye, 2019) whose their findings shows a positive perception regarding the use of CBT but suggest further studies on that. It is as a result of this that the study investigates the Perception of Lecturers on the use of CBT for Assessment in Public Tertiary Institutions in Bauchi State.

2. Purpose of the Study

The main purpose of this study is to investigate the perception of lecturers on the use of Computer Based Test for assessment in public tertiary institutions in Bauchi state.

3. Research Objectives

To investigate the Perception of lecturers on the use of Computer Based Test for

assessment in public tertiary institutions in Bauchi state.

4. **Research Question**

What is the Perception of lecturers on the use of Computer Based Test for assessment in public tertiary institutions in Bauchi state?

5. **Literature Review**

Computer Based Test (CBT) is a form of assessment in which the computer is an integral part of question papers' delivery, response storage, marking of response or reporting of results from a test or exercise (Whittington, Bull & Danson, 2020). It can be a multiple choice question based examination system that provides an easy to use environment for both test conductors and students appearing for examination. The main objective of a CBTs is to provide all the features that an examination system must have, with the interfaces that do not scare its users (Kuyoro, Maminor, Kanu & Akande, 2016). According to Obikeze, Amaechi, Akujieze and Anujeonye (2019), a Computer-Based Testing could be delivered on a stand-alone personal computer, within an isolated Local Area Network (LAN) or through the use of online technologies such as web-pages over the Internet. The two types of CBTS are:

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

2. Adaptive Test: Here 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 (Kuyoro, Maminor, Kanu & Akande, 2016).

According to Ojerinde (2014), CBT follows the same format and includes same question types as the paper based version, with some smart variation per candidate/computer. For example, questions are numbered differently such that candidates seated next to each other are allocated questions numbered and framed differently but testing the same objective. Answers are marked on same criteria. CBT allows testing centers to offer a more consistent test delivery, faster scoring and reporting and enhanced testing security.

Williams (2017) Computer based test requires a system of interconnected computer networks that the Standard Internet Protocol Suite (SIPS) to serve the users. Computer systems which are used for CBT are made of two major components for them to carry out their functions as delivering examination questions they help to store examination questions and allow students to access them. The two parts are hardware and software. Computer hardware refers to the physical components of the computer i.e. the aspect of computer that can be seen, touch and felt. While software refers to the set of instruction that are fed into the system which enable the computer to process information or data, and these are application software.

Computer-based tests (CBT) are the form of assessment in which the computer is an integral part of question papers' delivery, response storage, marking of response or reporting of results from a test or exercise. Conole and Warburton (2015) defined CBT as 'the use of computers for assessing students' learning'. It is required to think, re-consider, and modify or change the traditional test manners. Electronic assessment tools had reduced the load of teachers and facilitate exams execution purposefully because of inclusion of ICTs in education. CBTs can be applied to promote further efficient learning by examining students' knowledge and understanding in many fields. Students' prior experience in computer and communication skills is essential matters in CBTs. CBT method is a method that may not suit the learning styles of many students. The primary factor in determining whether an assessment program is beneficial or not depends on whether the assessment tasks are relevant to the purposes and learning outcomes for the course, not forgetting the attitudes and skills that are to be examined. Computer and related technologies provides a powerful tool to encounter the challenges of designing and implementing assessments modes that go beyond the conventional practices and

facilitate accessing a widely sources of information, cognitive skills and knowledge (van Groen & Eggen, 2019).

Computer-Based Test is a way of conducting examinations with the use of computer as a medium. Computer-Based test is a test that can be used in a supervised or non-supervised environment. The uses of computers are well known and apparent in teaching and learning process, but its integration to testing in education has not been fully utilized (Raikes & Harding, 2013). With the development of technologies, computer has evolved as a tool that can improve the accuracy and efficiency of tests. Computers have transformed the way testing is being conducted over the years and computers have been used to administer examinations since the 1970s (Liao & Ho, 2010). As computers become increasingly available in educational settings; teachers make use of it to administer tests (Nurhikmah, Farida & Ervianti, 2021). Computer-based test helps to develop new assessment methods by combining flexible technical possibilities with elaborated understanding of how to assess various forms and levels of knowledge.

However, as institutions started to accomplish computer-based testing in their examination systems along with traditionally paper-based testing systems, concerns arose about the comparability of scores from the two administration modes (Wang, 2014). As the computerized tests have been used for almost 20 years (García, 2017), and the computer assisted language learning (CALL) has been common since the middle of 20th century, it has been necessary to develop the means to include computerized tests (Leahy, Lyon, Thompson, & William, 2015). Russell and Haney (2020) asserted that the "mismatch between the mode of learning and assessment could cause achievement to be inaccurately estimated.

In a study conducted by Olafare, Jimoh and Ayoola (2019) on lecturers' acceptance of CBT in universities in Nigeria found that lecturers in Nigerian universities accepted the use of CBT for assessment because they perceived CBT to be useful, easy to use and credible. Lecturers had favourable attitude towards the use of CBT for assessment and the lecturers had intention to use CBT for assessment. However, majority of lecturers in Nigerian universities are not actually using CBT.

Noyes and Garland (2018) believe that the benefits and use of standardized computer-based tests by lecturers in many higher institutions, such as quick and objective results and the ease of comparing results with others make this method very popular among many lecturers. Moreover, moves toward computerized testing are rooted in the advantages it provides in comparison with traditional paper-and-pencil format (Choi & Tinkler, 2012; Kim & Huynh, 2017; Kingston, 2019). Such advantages, according to the findings of mentioned studies, include cost-effective administration, ease of administration, more accuracy, immediacy of scoring and reporting, and flexible test scheduling and location. As pointed out by other authors on the important of using technology in education, for many reasons, the use of computer-based test is becoming widespread (Poggio, Glasnapp, Yang & Poggio, 2015; Lottridge, Nicewander, Schulz & Mitzel, 2018; Yurdabakan, 2012). Leeson (2016) identifies the factors leading to difficulties in CBT applications under two titles, as factors originating from "users" and "technology used". He states that the user's gender, the ability to process information, the ability to use a computer and the level of anxiety could have an influence on an application. He gave the size and resolution of monitors, writing character and its length, the way the problem is presented, and having the option of review or not as technology originated factors.

However, in terms of lecturers' perception, a study by Edumadze, Ossei-Anto, Edumadze, Tamakloe, Asamoah and Boadi, (2014) assessed the awareness and perceptions of lecturers in using e-learning tools for instructional delivery in the University of Cape Coast. Specifically, the study sought to investigate the state of the awareness and perceptions of

lecturers in incorporating e-learning tools in their lesson preparation and delivery. The target population was lecturers of UCC and responses were obtained from 128 lecturers who were randomly sampled for the study. The study revealed among other things that, many lecturers fail to use e-learning tools because they are not proficient in using them. Nevertheless, they are ready or willing to participate in programmes to equip them with the requisite skills that will make them proficient in using the e-learning tools. The study recommends among other things that the Computer Centre of the University should educate the lecturers on e-learning and give them the necessary training that will equip them in using the e-learning platform (Moodle) that the university had installed since 2007. Also, the University should provide reliable Internet and computer access coupled with adequate technologically enhanced classrooms and laboratories to facilitate the integration and use of e-learning tools by lecturers in their instructional delivery.

Anzene (2014) also conducted a study and investigated lecturers' perceptions of the usefulness; ease of use and credibility of the CBE in Nigerian universities. The study adopted survey method of descriptive research. Sample was drawn from the lecturers from four Nigerian universities: Covenant University; Kogi State University; University of Ibadan; and University of Ilorin. A total of 850 lecturers represented the sample for the study. The data were analyzed using percentage and mean to answer the research questions. The study revealed that lecturers had positive rating on perceived usefulness (65.1%), ease of use (65.2%), and credibility (70.2%) of CBE. The study concluded that lecturers perceived the CBE as useful, easy to use and credible. The implication was that the perception of the usefulness, the ease of the use and the credibility of the CBE would lead to increase in the use of CBE by lecturers in Nigerian universities. It was recommended among others that Nigerian universities should improve the efficiency of the computer-based examination to increase its credibility. Lecturers should be more encouraged to constantly use the CBE while conducting their tests and examinations not minding the number of students.

6. Methodology

The study aims at investigating the Perception of Lecturers on the use of CBT for Assessment in Public Tertiary Institutions in Bauchi State. Descriptive Survey research design was employed for the study. The population of the study comprises of 3144 lecturers from 9 different tertiary institutions in Bauchi state. Taro Yamane (1967) method of sample size calculation was used to determine sample size for the study. A stratified proportionate sampling technique was used to sample out a total of 353 lecturers which were used as the sample for the study. A structured Questionnaire titled "Perception of Lecturers on the use of Computer Based Test (CBT) for Assessment Questionnaire (PLU CBTAQ)" was the main instrument used for data collection in the study. The instrument was validated by three experts two from Department of Science Education (Biology Option and Physics Option), the other one from Department of Library and Information Science all from Faculty of Technology Education, ATBU, Bauchi. The instrument were pilot tested on 20 lecturers from Gombe state University and the Cronbach Alpha value for the internal consistency of the measured items obtained was 0.85. 353 questionnaires were administered to the participants across all the 9 tertiary institutions in Bauchi state and 311 were returned valid. The data collected were analyzed using mean and standard deviation.

7. Result

Results for the Research Question

What is the Perception of Lecturers on the use of CBT for Assessment in Public Tertiary Institutions in Bauchi State?

Table One: Mean and Standard Deviation of Lecturers' Perception on the Use of CBT.

S/No	Items	N	Mean	Std. Deviation	Decision
1	Using CBT gave me greater control over my courses.	311	4.34	0.60	Agree
2	CBT improved my students' academic Performance.	311	4.36	0.56	Agree
3	CBT improved my academic productivity	311	4.42	0.53	Agree
4	CBT enhances the effectiveness of my teaching activities.	311	4.32	0.60	Agree
5	CBT improved the quality of the examination for students.	311	4.36	0.60	Agree
6	CBT provides an attractive examination for my students	311	4.27	0.67	Agree
7	CBT is relevant to the course I teach.	311	4.20	0.65	Agree
8	The use of CBT for my course influenced other lectures' use of CBT	311	4.15	0.70	Agree
9	I like using CBT because I am computer Literate.	311	4.16	0.68	Agree
10	My University requires me to use CBT for my test	311	4.29	0.66	Agree
11	CBT makes marking easier for me	311	4.22	0.64	Agree
12	CBT allows applications such as statistics, charting, graphing during test.	311	4.39	0.60 b	Agree
13	CBT allows good communication such as email, mailing lists, conferencing during examination.	311	4.40	0.61	Agree
14	If CBT were not mandatory, I would still use it	311	4.45	0.58	Agree
15	Using CBT makes it easier for me to do my course.	311	3.52	1.45	Agree
16	CBT does not improved my academic productivity	311	4.41	0.59	Agree
17	My students find CBT Easy to Use.	311	4.49	0.56	Agree
18	I need an experienced person nearby to assist me when I use CBT for my test.	311	4.39	0.53	Agree
19	I don't need an experienced person nearby when I use CBT for my test.	311	4.47	0.54	Agree
20	My students find CBT difficult to Use.	311	4.37	0.53	Agree

Average Mean = 4.29

Source: Field Survey, 2023

Key: N = Number of Respondent = 311

Strongly Agree = 4.50-5.00, Agree = 3.50-4.49, Neutral = 2.50-3.49, Disagree = 1.50-2.49, Strongly Disagree = 1.00-1.49

The table above showed the lecturers' perception on the use of CBT for assessment in public tertiary institutions in Bauchi state. Five point's scales Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree were used to indicate respondents' perception on the use of CBT for assessment in public tertiary institutions in Bauchi state. The table indicates that all the twenty items had their mean value ranged from 3.52 – 4.49 minimum and maximum

respectively, and from the result, all the items had their mean values fall within the ranged of Agree. This means that lecturers in public tertiary institutions in Bauchi state agree to have positive perception on the use of CBT for assessment by agreeing with all the 20 statements. While there are no items that fall within the mean range of Strongly Agree, Neutral, Disagree and Strongly Disagree. All the 20 items had a grand mean of 4.29 which fall within the mean range of Agree (A); 3.50 - 4.49. This generally indicates that lecturers in public tertiary institutions in Bauchi state have positive perception on the use of CBT for assessment.

8. Discussion of Result

Based on the findings of this study as presented earlier in the table above, the table indicated that Lecturers in public tertiary institutions in Bauchi state have positive perception on the use of CBT for assessment. This result is in agreement with the findings of Obikeze, Amaechi, Akujieze and Anujeonye (2019) whose investigated the lecturers' perceptions of the use of CBT in Nigerian Universities. In line with this, Ogunlade and Olafare (2014) who's studied revealed that Nigerian universities lecturers have positive perception on the usefulness and ease of use and credibility of CBE for assessment. Similarly, the result of this study aligned with the findings of Anujeonye (2019) who found that lecturers' perception on the use of CBT had positive impact on the students' performances. However, the findings of this study is contradicted with the findings of Ifeyinwa and Vera (2019) on CBT assessment implementation in a Nigerian higher institution and a lecturers' work stories: Implication for e-counselling. They found out that many lecturers do not have adequate ability level in the use of computers, especially the chief lecturers and older lecturers in authoring questions for CBT.

9. Conclusion and Recommendation

This study investigated the Perception of Lecturers on the use of CBT for Assessment in Public Tertiary Institutions in Bauchi State. Findings of the study shows that lecturers in public tertiary institutions in Bauchi state have positive perception on the use of CBT for assessment. However, it was recommended that lecturers in public tertiary institutions in Bauchi State should be encouraged to constantly use CBT for assessment since they perceived the use of computer based test positively, so as to improve academic productivity of their students.

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